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An effective teaching model based on classroom observations of students with attention deficit hyperactivity disorder

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AN EFFECTIVE TEACHING MODEL BASED ON CLASSROOM OBSERVATIONS OF STUDENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

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by

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DEDICATION

This thesis is dedicated to my mother, who ensured that her children received the education that circumstances denied her.

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ABSTRACT

The purpose of this study was to investigate the classroom interactions of students diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) to develop a model of effective teaching for them. Bronfenbrenner's (1979) ecological model, which views individual development as a function of the interactions between an individual and different aspects of the surrounding environments, was used as a theoretical framework for this investigation.

The study employed a multiple-case study mode of enquiry (Yin, 1994). Data were collected on ten students at two schools over a period of one school year, although findings relating to only five of those students are presented in detail. A rich data base concerning classroom interactions developed from narrative recording of timed classroom observations; measurements of time on task and academic engaged time; formal and informal interviews with students, parents, teachers and principals; and collection of work samples.

Results from this study confirmed the literature which argues that students with ADHD have a predisposition to learning and behavioural difficulties. Learning environments, however, have the potential to either exacerbate these difficulties, allowing the full expression of behaviours that will detract from learning, or alternatively to suppress those behaviours and maximise the developmental potential of students with this diagnosis. This study confirmed the effective teaching literature for students with ADHD. Findings from this study also suggest that a model of effective teaching for students with this diagnosis contains organisational, management and instructional strategies which interact with a strong interpersonal bond between student and teacher to facilitate high levels of engagement in learning tasks. This bond or *alliance* between student and teacher is seen to be critical for students with ADHD as it acts as a prime motivator, assisting students to focus their attention and maintain engagement in core educational experiences.

It is recommended that more consideration be given in teacher education courses to the development of interpersonal skills and to ways in which a strong teacher/student bond may be developed. Additional recommendations relate to specific classroom practices which were found to maximise engaged time. Research recommendations include the development of training programs for students with ADHD in co-operative learning and group task skills and the investigation of the role of visual aids and self-talk with this population.

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CHAPTER ONE

THE PURPOSE AND AIMS OF THE STUDY

The focus of this thesis is the condition termed Attention Deficit Hyperactivity Disorder (ADHD) and the way in which primary school aged children diagnosed with this condition interact with teachers and other children in regular classrooms. There is mounting evidence (which is examined in the literature review) that the characteristics of ADHD predispose children to problems in the school context. Yet there has also been a growing recognition of the fact that an understanding of individual behaviour must consider the context of that behaviour (Doyle, 1986; Doyle & Ponder, 1975; Gettinger, 1986; Gettinger, 1988). The World Health Organisation (1990) definitions of the terms *impairment, disability* and *handicap* highlight the fact that individuals are handicapped by a disability only when the environment does not support or allow their participation. The extent to which a predisposition toward learning and behavioural problems becomes manifest may well be determined by the nature of the learning environment, and the *goodness of fit* or level of congruence that develops between the ecology of the learning environment and the individual.

It is the nature of the relationships that exist between students with ADHD, their teachers, peers and classrooms that will be explored in this thesis. Taking a holistic approach, the ecology of the learning environment includes examination of individual students with ADHD, their interactions with peers, the nature of their learning tasks, and the varying roles of their teachers such as organisers of the physical environment, managers of student behaviour and instructors. The purpose of this thesis, therefore, is to develop a model of effective teaching which identifies the characteristics of a classroom learning environment that maximise educational outcomes for students with ADHD.

1.1 THE AIMS OF THE STUDY

To assist the achievement of this purpose, the following aims were developed:

1. to examine the behaviour of students diagnosed with ADHD in their natural school environment;
2. to investigate the nature of the relationships between students with ADHD and their peers;
3. to investigate the relationships between learning tasks and the academic engagement of students with ADHD;
4. to investigate the organisational, management and instructional strategies of teachers which are related to increased time on task and academic engaged time for students with ADHD;
5. to develop a model of effective teaching practice which is congruent with the cognitive, physical and affective needs of students with attention disorders.

These aims led to the development of the following questions which were generated throughout the study and which provide a framework for the reporting of the study.

1. How do the core characteristics of Attention Deficit Hyperactivity Disorder impact on learning and behaviour?
2. How does the nature of a learning task affect the time on task and academic engagement of students with ADHD?
3. How do peer interactions affect the classroom behaviour and learning of students diagnosed with ADHD?
4. What physical classroom arrangements are associated with increased time on task and academic engaged time for students diagnosed with ADHD?
5. What classroom management strategies are associated with increased time on task and academic engaged time for students with ADHD?

6. What instructional strategies are most effective in facilitating time on task and academic engaged time for students with ADHD?
7. How does the affective climate of the classroom contribute to the learning environment of students with ADHD?
8. What combination of factors provide the most appropriate learning environment for students with ADHD?

1.2 THE EVOLUTION OF CURRENT UNDERSTANDINGS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER

Because the condition Attention Deficit Hyperactivity Disorder is central to this thesis, a brief review of the development and current understanding of this condition is provided at this point in order to orient the reader to those key aspects which are relevant to this research. An understanding of how approaches to behaviour and attention problems are situated in particular historical and cultural contexts places current views of this disorder in perspective.

There have been frequent reconceptualisations of this condition since early this century when George Still (1902) first described symptoms which are recognisable today as being similar to the diagnostic criteria used for Attention Deficit Hyperactivity Disorder. Even as the syndrome emerged, researchers were beginning to link the described behaviours to traumatic brain injury and central nervous system anomalies (Lerner, Lowenthal, & Lerner, 1995), associations which are strongly supported today. Werner and Strauss (1941) and Strauss and Lehtinen (1947) conducted large scale research on institutionalised children throughout the 1940s, and identified a syndrome characterised by hyperactivity, distractibility and impulsivity among other characteristics which they believed resulted from brain damage.

The global nature of the term "brain damage" was problematic in that there was no differentiation between the level of damage proposed as the cause of behavioural

symptoms, such as impulsivity and hyperactivity, and the more profound damage which resulted in severe intellectual and physical disabilities. For this reason the terms *minimal brain damage* (Laufer & Denhoff, 1957) and *minimal brain dysfunction* (Clements & Peters, 1962) were suggested to refer to the more subtle neurological differences associated with the behaviours typical of students with learning difficulties and attention disorders. Thus, minimal brain dysfunction (MBD) became the acceptable term for a syndrome which was characterised by specific learning disabilities, hyperactivity, impulsivity and attention difficulties. Abnormal electroencephalograms (EEGs) were also used as part of the diagnosis although these were not apparent in every case, and some children with abnormal EEG readings demonstrated no learning or behavioural deficits.

The difficulty with the term MBD was that it did not incorporate clear guidelines for diagnosis. The first edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1968) attempted to refine the diagnosis and develop a set of criteria which would assist diagnosis. Thus, *Hyperkinetic Reaction of Childhood*, a disorder characterised by hyperactivity, restlessness, distractibility and attention problems was listed. This elaborated on the term *hyperactivity* to describe a condition of motor agitation accompanied by a state of nervousness and restlessness.

Three subsequent editions of the Diagnostic and Statistical Manual (American Psychiatric Association, 1980; American Psychiatric Association, 1987; American Psychiatric Association, 1994) attempted to clarify the nature of the disorder further. The 1980 edition flagged the primary role that attention difficulties were perceived to play in the disorder with the introduction of the term *attention deficit disorder* (ADD). Two types of ADD were differentiated: ADD with hyperactivity (ADDH) and ADD without hyperactivity (ADD/noH). Other diagnostic criteria included onset by the age of seven years and a duration of at least 6 months.

The 1987 edition raised the profile of the hyperactivity component with the listing of *attention deficit hyperactivity disorder* (ADHD) as the primary category and the term *undifferentiated attention deficit disorder* (U-ADD) being used to describe attention deficit disorders with no hyperactivity component. Children within the latter group were far less visible, exhibited less serious conduct problems, were less impulsive and often appeared sluggish and "dreamy". Their problems related more to those of social withdrawal and depression.

The fourth edition of the DSM (1994) made further modifications to the diagnostic criteria based on research which identified *inattention* and *hyperactivity-impulsivity* as the two primary factors relating to this condition. Within the broader classification of ADHD, three subtypes were identified:

Type 1 ADHD-IA	Primarily inattentive subtype which is roughly equivalent to ADD without hyperactivity, or undifferentiated ADD. Students receiving this classification must display at least six symptoms of inattention to a debilitating level for at least six months;
Type 2 ADHD-HI	Primarily hyperactive-impulsive subtype, a subtype which did not exist in previous editions, referring to children who display at least six symptoms of hyperactivity and impulsivity to a degree which is maladaptive and inappropriate for their developmental level but who do not display the attention difficulties; and
Type 3 ADHD	Combined subtype. This diagnosis includes children who display at least six symptoms of inattention in addition to at least six symptoms of hyperactivity-impulsivity.

It is also a requirement of a diagnosis of ADHD that the symptoms cannot be explained by other factors such as major environmental problems or emotional disturbance. The onset is usually between two and four years and must be evident, even if not formally

diagnosed, by seven years of age. The symptoms must be present in two or more situations and the disturbances must be pervasive enough to cause significant impairment to the individual's normal functioning (American Psychiatric Association, 1994).

1.3 CURRENT CONCEPTUALISATION OF THE CORE CHARACTERISTICS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER

A reformulation of the ADHD condition is currently under consideration. Barkley (1997) and Edwards and Barkley (1997) posit that all symptoms of ADHD are associated with underlying problems of the self-regulatory or *executive* processes which affect working memory, self regulation of affect-motivation-arousal (which is responsible for self control), internalisation of speech (leading to rule-governed behaviour, problem-solving and self-questioning), and reconstitution (the analysis and synthesis of behaviour). Thus, the condition is perceived to be less about underdeveloped or defective attentional processes and more about difficulties in monitoring and directing attention appropriately. These skills are necessary for the processing of information, for task persistence and for modifying behaviour to fit environmental demands.

According to this conceptualisation, difficulties with self-regulatory processes lead to extreme variability in performance due to an inability to modulate arousal levels to fit situational demands (Schwean, Parkinson, Francis & Lee, 1993). The inability to fine-tune and to regulate one's actions results in poor performance on activities requiring maintenance of attention over time, self-directed and organised attention and the withholding and evaluating of responses. These are tasks that the school environment demands on a regular basis. The underlying difficulties mentioned above are those that lead to the symptoms normally associated with ADHD: attention problems, impulsivity and hyperactivity.

1.4 RATIONALE FOR THIS STUDY

Significant controversy among academics, medical practitioners, teachers and parents surrounds the condition known as ADHD. There is some debate concerning the perceived legitimacy of the condition (Cooper & Ideus, 1995; Goodman & Poillion, 1992; Whalen & Henker, 1989), the lack of operational definitions of the various descriptors (Edwards, Schulz & Long, 1995; Reid, Maag, & Vasa, 1993) and the reliability of using behavioural checklists in its diagnosis (Reid et al., 1993). The use of psychostimulant and antidepressant drugs in the treatment of the condition has been widely debated (Armstrong, 1995; Fiore, Becker, & Nero, 1993). Sensational reporting in the popular media of extreme behaviours which have been associated with ADHD and its categorisation in a manual of mental disorders adds to the controversy. While all these factors are of interest and could justify investigation of the condition, the issues of progress at school and ways in which attention disorders may affect learning and behaviour are of most concern to educators. From an educator's point of view, this study is timely and justifiable on the following grounds, each of which will be elaborated upon in the proceeding sections:

- there is a significant incidence of ADHD in the school-aged population (Barkley, 1990; Barkley, 1991; Barkley, 1992; Carmichael et al, 1997; Carroll, 1993; Edwards & Barkley, 1997);
- established links have been made between ADHD and learning and behavioural problems (August & Garfinkel, 1990; Cantwell & Baker, 1991; Carlson et al, 1987; Dykman & Ackerman, 1991; Evans et al, 1995; Hinshaw, 1992; Shaywitz, Fletcher, & Shaywitz, 1992; Szatmari, Boyle & Offord, 1989; Trautman, Giddan, & Jurs, 1990; Zentall, 1993); and
- the medical-disease model of ADHD may not be the most helpful in addressing the full range of needs of students diagnosed with ADHD: educational intervention is required (Barkley, 1990; Barkley, 1992; Carmichael et al, 1997; Evans et al, 1995; Fell & Pierce, 1995; Pelham, 1993).

1.4.1 Significant incidence of attention deficit hyperactivity disorders

Students with a diagnosis of ADHD represent a significant proportion of the students enrolled in regular schools in the United States, Europe, South Africa and Australia (Barkley, 1990; Barkley, 1992; Carmichael et al, 1997; Carroll, 1993; Edwards & Barkley, 1997; Orgil, 1995). While the label has changed from *minimal brain dysfunction* to *hyperkinetic syndrome* to *attention deficit disorder* throughout this century, an increasing number of children with a constellation of symptoms relating to poor sustained attention, impulsivity and increased motor activity are now being diagnosed and, in many cases, given prescription drugs to modify their behaviour and learning patterns (Barkley, 1990). While incidence estimates in the United States once soared to as high as 20% (Yannow, 1973), the recent Australian National Health and Medical Research Council Report (Carmichael et al, 1997) put the incidence of attention disorders at around 4%, with boys outnumbering girls by 3:1. Significant numbers of students so diagnosed are appearing in our schools and educators need to broaden their understanding of this condition in order to maximise the educational opportunities of such students.

1.4.2 Links between ADHD and learning and behavioural problems

There is now a well established body of research which links ADHD to a range of learning and behavioural problems. Language disorders are widely reported (Chess & Rosenberg, 1974; Giddan, 1991; Lerner et al., 1995; Scruggs & Mastropieri, 1992; Zentall, 1993). Reading disorders occur in as many as 30% of these children and an additional 10-15% are reported to have other academic disabilities, particularly in the areas of spelling and mathematics (August & Garfinkel, 1990; Douglas & Benezra, 1990; Dykman & Ackerman, 1991; Fergusson & Horwood, 1992; Gittelman, Klein & Feingold, 1983; Gomez & Cole, 1991; McGee, Williams & Moffit, 1989; Sagvolden &

Archer, 1989; Samuels & Turnure, 1974; Shaywitz et al., 1992; Zentall, 1989; Zentall, 1993).

Behavioural problems have also been widely associated with a diagnosis of ADHD (Bailey & Rice, 1997; Berk & Potts, 1991; Carlson, 1987; Carmichael et al., 1997; Carroll, 1993; Cooper & Ideus, 1995; Giddan, 1991; Hinshaw, 1992; Krupski, 1981; Reid et al., 1993; Young-Loveridge, 1997). Many of the previously mentioned researchers have noted that these learning and behavioural difficulties can lead to a range of second order problems for diagnosed students. Poor motivation, low self esteem and social rejection are widely reported. Antisocial, oppositional, aggressive and even violent behaviours are also often associated with the diagnosis. ADHD has emerged as a serious and controversial issue because of the reported links to such a wide and disturbing range of outcomes.

1.4.3 Need for educational intervention

For many years a medical model determined the treatment of students with disabilities and/or learning difficulties (Chee et al., 1989). It is only comparatively recently that educators have reclaimed responsibility for the educational management of such students. The increasing use of psychostimulant drugs as a "first choice" management option for ADHD is of increasing concern to educators who are reluctant to have, once again, a medical model overriding educational considerations. While there is well documented evidence that stimulant medication improves on-task and compliant behaviour and leads to increases in the amount of work completed (Dykman & Ackerman, 1991), such medication does not directly address academic deficits and is most effective when part of a multimodal response to the condition (Evans et al., 1995; Pelham, 1993).

Educators have a responsibility to explore the ways in which they may contribute to a more effective learning environment for students diagnosed with ADHD. Current teaching practices are clearly not addressing the needs of these students because the disruption that accompanies them is chronic and recurrent (Cooper & Ideus, 1995; Pelligrini & Horvat, 1995). There is a great need for further study into how teachers may best meet the needs of such children in order that they, and their peers, may have more satisfactory and fulfilling educational experiences.

1.5 SIGNIFICANCE OF THIS STUDY

This study is significant chiefly because it has been conducted in a classroom setting and findings have been grounded in data gathered in the natural environment of students with ADHD, their peers and their teachers. While ADHD has been the focus of increasing research attention – indeed it is one of the most researched conditions in the United States (D'Alonzo, 1996) – much of this research has had a medical focus and taken place in laboratories or clinical settings where the effects of medication on such variables as sustained attention, response time and impulsivity measures have been analysed (Balthazor, Wagner & Pelham, 1991; Chee et al., 1989; Evans & Pelham, 1991; Hamlett, Pelligrini & Connors, 1987; Harper & Ottinger, 1992; Pelham et al., 1997; Robins, 1992). While adding to our understanding of the above-mentioned factors, there has been little investigation or testing of these findings in the natural learning environment of these students: the classroom (Burcham & Carlson, 1994; Burcham, Carlson, & Milich, 1993; Carmichael et al., 1997; Reid et al., 1994). Those studies that have taken place in classrooms have been conducted largely in special education classrooms or other highly structured settings (Umbreit, 1995) and so have limited application to regular classrooms. This study will be grounded in data collected in classrooms where students with ADHD spend most of their time.

Also, in contrast to the scientific, laboratory or clinic-based research into ADHD, there has been a proliferation of information – and often misinformation – in the popular press regarding the condition. The term ADHD has now entered common parlance. Parents, members of the medical profession, social workers, child psychologists, family therapists, social workers, and teachers regularly use the term. There is persistent interest in the media with regular documentaries, pull-out articles and special features devoted to this condition. Anecdotal evidence and the researcher's encounters with families dealing with ADHD support the view that the varying opinions on its cause(s), diagnosis, prognosis and treatment are causing confusion and distress to the children, parents and teachers concerned. There is need for an investigation of this condition in typical classroom settings in order to discriminate between those beliefs which are popular myths and those which have their basis in appropriately grounded research.

There has also been significant research into classroom management, effective teaching and academic engaged time in recent years but little classroom-based research has been specifically devoted to the learning and behaviour of students with ADHD: in particular the *congruence* between the child with an attention disorder and the learning environment. Most of the recommendations regarding the effective teaching of students with ADHD have been extrapolated from studies conducted with regular students (Burcham & Carlson, 1994) or have been based on studies done in clinical or laboratory settings. This thesis is an examination of the relationship between students diagnosed with ADHD and the ecology of their classrooms conducted in order to confirm, extend or challenge current beliefs concerning how the education of these students may be best managed.

Attention Deficit Hyperactivity Disorder has been established as a disorder which constitutes a considerable threat to academic achievement. Much of the available literature concerning ADHD has concentrated on the biochemical nature of the condition

and has been conducted in laboratories or specialised settings. Current treatments focus on the disorder at the biochemical/neurochemical level. There is a need to examine ADHD within a broader framework that not only focuses on the condition of ADHD but which also examines the interaction of ADHD with the conditions that exist in a school and classroom setting.

Classrooms and schools may be perceived as organisations or *systems* in which both adaptive and maladaptive behaviours may be either augmented or diminished (Doyle, 1986; Doyle & Ponder, 1975). It is therefore important to examine not only the way in which these children may be different from their peers, but also whether the "system" provides a safe, secure and positive environment for these students to manage their ADHD and to learn more effectively. Students with ADHD can affect the teacher's ability to fulfil his or her role as a teacher and thus have significant impact on the functioning of the classroom system. Teachers may also abdicate their responsibilities for classroom management, organisation of teaching and learning activities, and other aspects of their role, in which case systemic dysfunction is likely to occur. Any single element of the system has the potential to affect the equilibrium, and therefore the functioning, of the entire system.

If classrooms are to survive as a system, they need to exist at a subtle point of balance, having both some level of stability and the ability to adapt to the needs of students with ADHD. The difficulties evident in many classrooms containing students with ADHD reflect how problematic finding that point of balance can be. The purpose of this thesis is to examine the classrooms in which students with ADHD operate in order to develop a model of effective teaching which provides positive educational experiences for these students. One way of understanding the interaction between the child and the system is through the framework of Systems Theory (Bronfenbrenner, 1979; 1989; von Bertalanffy, 1933; 1952; 1968) which will be discussed in Chapter Two.

1.6 DELIMITATIONS OF THIS STUDY

Systems Theory, specifically Urie Bronfenbrenner's (1979) ecological model, has provided the theoretical framework for this study. This will be elaborated upon in Chapter Two. In order to fully understand the interaction between a student diagnosed with ADHD and the classroom environment, ecological theory demands that an examination be made of the individual, of his or her immediate environment, of the broader, more indirect influences, and of the complex relationships that exist among all those elements. That is not possible within the scope of this thesis. In order to make the study manageable some limit had to placed on the issues under investigation. Emphasis has been placed on the innermost level of Bronfenbrenner's (1979) model, which he referred to as the microsystem, specifically the microsystem of the classroom. Full acknowledgement is given to the fact that only a partial application of ecological theory is possible under these circumstances. Thus, while there is some analysis of other levels within the system when elicited by the data, such as the ways in which classroom systems interact with family systems, this study is largely limited to an analysis of the individual target students and their immediate classroom environments.

1.7 ORGANISATION OF THIS THESIS

In this introductory chapter, the focus of the thesis, its purpose and aims have been presented. The background to the development of the concept of Attention Deficit Hyperactivity Disorder has been provided to orient the reader to this condition. The rationale for the current study and a statement of its perceived significance have been followed by an explanation of the scope of the thesis.

The theoretical framework used in the study is explained in Chapter Two. Ludwig von Bertalanffy's (1968) General Systems Theory and more specifically Urie Bronfenbrenner's (1979) ecological model provide the conceptual structure for exploring the functioning of students diagnosed with ADHD in primary classrooms.

Chapter Three provides a literature-based discussion of ADHD and proposed links to learning and behaviour difficulties. The precise meanings which are attached to the term Attention Deficit Hyperactivity Disorder for the purposes of this thesis are presented. In terms of Bronfenbrenner's ecological model, this chapter examines the potential impact of individual predispositions to learning failure and behavioural problems on a regular classroom environment.

The ecology of classroom learning environments and the factors which either contribute to, or detract from, learning are examined in Chapter Four. The links between time on task, academic engaged time and learning are explored and the results of classroom-based research on effective teaching are presented. The potential of a learning environment to either maximise learning opportunities or to allow the full manifestation of learning and behavioural problems to occur is discussed. The critical role of the teacher in the development and management of an effective learning environment is included in the discussion of the classroom environment. Differing views on the importance of a positive affective climate are explored. A discussion of the psychoanalytic concept of *alliance* and how it may contribute to an understanding of the teaching/learning process concludes the chapter.

Chapter Five provides a justification of the methodological approach used to examine the complex and reciprocal classroom interactions which either minimise the effects of ADHD, and thus provide an effective learning environment; or contribute to the full manifestation of behaviours which inhibit effective learning. This chapter explains the selection of the research design, and details data collection, recording and organisation procedures.

Chapter Six presents a discussion of some of the ethical considerations which arose throughout this research with reference to four particular issues of concern: informed

consent; confidentiality; the preservation of individual realities; and "crossing the line" between researcher and counsellor.

Chapter Seven reports on the cyclical processes of data coding, display and analysis which occurred throughout the study. Checks for reliability and validity which were utilised throughout the study are detailed.

Chapter Eight explains the format used to present the major findings related to each case study. As patterns and themes emerged, data were reconstructed into a series of tables for further systematic case analysis. Case-oriented data displays facilitated an overall understanding of each individual learning environment which was critical before broader understandings could be attempted. These descriptive matrices, grounded in the data, provided considerable assistance in the development and testing of a model of effective teaching for students with ADHD. The findings of the first case study are also included in Chapter Eight.

Chapters Nine to Twelve report the findings relating to the other four case studies. Preliminary discussion of the major trends for each case study is presented in each of the results chapters.

Chapter Thirteen provides a discussion of the major trends apparent when data from the five target students were combined. The major findings are presented as responses to the eight research questions posed in Chapter One. Chapter Thirteen culminates in a summary table of effective teaching practices which emerged from the data collected throughout this research.

Chapter Fourteen presents the conclusions of this research as a model of effective teaching practice for students with ADHD. Recommendations for teaching practice, teacher education and implications for further research are also included in this chapter.

CHAPTER TWO

THEORETICAL FRAMEWORK OF THE STUDY

Chapter One outlined the purpose and aims of this study and provided a background to the notion of Attention Deficit Hyperactivity Disorder. The significance that a diagnosis of ADHD may have for learning and behaviour and the need to explore ways in which the educational experiences of these students may be managed most effectively were discussed. Investigating these issues within the natural learning environment of classrooms was presented as an important way in which a contribution to this field may be made by this study.

Viewing classrooms as systems in which all elements interact to influence the functioning of that system, and which have the capacity to either support or suppress the learning of students, was suggested in Chapter One as a useful way in which to begin this investigation. Systems Theory, particularly the contribution of Urie Bronfenbrenner's (1979) ecological model, provides a useful theoretical framework for this thesis. In this chapter, the origins of Systems Theory are briefly explored before Bronfenbrenner's ecological model and its relevance to a classroom-based study of students with ADHD are discussed.

2.1 GENERAL SYSTEMS THEORY

The notion of a theory which broadly explains how systems operate may be traced to Ludwig von Bertalanffy (1933; 1952; 1968) who concluded as early as 1933 that

> the theory of development and of life in general must be a "system theory" – that is no more to be doubted or disputed. (p.180)

In 1968 von Bertalanffy published *General Systems Theory* in which he, rather portentously, announced it as

> a broad view which far transcends technological problems and demands a reorientation that has become necessary in science in general and in the gamut of disciplines from physics and biology to the behavioural and social sciences and to philosophy...it heralds a new world view of considerable impact. (p. xi)

This theory was, von Bertalanffy believed, both abstract and general enough to allow application *"to any 'whole' consisting of interacting 'components'"* (p. 112). It is thus relevant to families, to classrooms and to schools.

2.1.1 Definition of a "system"

Von Bertalanffy (1968, p. 199) stated that *"a 'system' can be defined as a complex of elements standing in interaction."* Therefore any ongoing group in which individual elements are linked together in order to function as a whole may be seen as a system. A classroom and a school would each be regarded as a system, with individual students and teachers being regarded as interacting elements within it. According to von Bertalanffy (1952), there are general principles holding for systems, whatever the individual elements and the nature of their interactions may be. Some discussion of these principles may facilitate an understanding of the ways in which students with ADHD function, along with their teachers and fellow students, within the complex system of a classroom.

Systems tend to preserve themselves and to strive toward equilibrium (von Bertalannfy, 1952, p. 184). They need both a certain level of stability and the ability to adapt and change. In order to do this they must operate according to characteristic patterns of hierarchical organisation which determine allocation of roles, communication patterns and behavioural expectations. If the approved hierarchy is disturbed, dysfunction

within the system may occur. If system members take on the responsibility of other members, or fail to fulfil their own, problems arise within the system.

Systems are dynamic (von Bertalannfy, 1952, p. 109). There is a constant flow of interactions, processes and forces within systems. Change within any aspect of the system is likely to produce overall change. Students with ADHD can greatly change the dynamics of their classrooms. An understanding of the complex interactions within classrooms is essential if we are to provide an appropriate environment for students with ADHD.

Systems have histories (von Bertalannfy, 1952, p. 109). Every element within a system carries traits of the past, not only of its own individual existence but also in some ways of the history of the generations which preceded it. According to Systems Theory, teachers should have an understanding of how a diagnosis of ADHD impacts on a student's behaviour, of how past unsuccessful experiences will impact on current performance and behaviour, and of how past experiences will colour the expectations and reactions of all students within the classroom.

Within Systems Theory individuals are perceived as one part of the system and individual development is viewed as a joint function of the person and the environment. The environment includes the immediate settings in which the individual interacts, but also extends beyond that to include wider systems. Systems Theory therefore provides a framework within which the complex interactions within a classroom may be examined. It acknowledges that individual behaviour can never be judged, or even viewed, as an isolated phenomenon.

There are clear connections between Urie Bronfenbrenner's (1979) ecological model and von Bertalanffy's General Systems Theory. While Bronfenbrenner did not refer directly to the work of von Bertalanffy, his model developed systems notions further by

relating them directly to a child's development. Bronfenbrenner's model is also useful in that he particularly addressed, in part, the development of those members of a group who are less competent or who are operating in a position of some disadvantage. This thesis puts forward the view that students with ADHD are predisposed to disadvantage within the educational system, thus Bronfenbrenner's model is appropriate in providing some theoretical understanding and explanation of the way in which students with ADHD operate within the system of a classroom.

2.2 URIE BRONFENBRENNER'S ECOLOGICAL MODEL

Bronfenbrenner first published his theory of child development in 1979 (Bronfenbrenner, 1979). He refined his theory in 1989 (Bronfenbrenner, 1989) and by 1995 (Bronfenbrenner, 1995) was describing his view of development as a bioecological model, combining a child's biological disposition with multiple environmental forces. Bronfenbrenner referred to his ecological model as

> a theory of environmental interconnections and their impact on the forces directly affecting psychological growth. (1979, p. 8)

While Bronfenbrenner's ecological model encompassed a very broad view of the environment extending from immediate settings to the broad ideological and cultural systems within which all individuals operate, certain of his concepts are of more relevance than others to a thesis concerning the interaction of students with ADHD and their classroom environments. His notion of *molar activities*, his particular definition of *roles,* and his hypotheses pertaining to the interactions within what he referred to as the *mesosystem*, are particularly useful in providing a theoretical framework for this study.

Only some of Bronfenbrenner's fifty hypotheses have been used to explicate the interactions that exist in classrooms containing students with ADHD. This has not been a random selection. Only those hypotheses which have a systematic relationship to the

study of students with ADHD and which facilitate an understanding of how classroom interactions may either assist or frustrate the development of positive educational experiences of students with ADHD, have been addressed.

Bronfenbrenner's ecological model views an individual child as operating within a complex system of relationships affected by multiple levels of the surrounding environment. Bronfenbrenner expanded the traditional view of the environment, which was limited to those events and conditions immediately surrounding an individual, to a much broader view. The ecological environment is conceived of as extending far beyond the immediate environment which directly affects the developing person, such as the home or school. Of equal importance are the links between these systems, such as those relationships between home and school. Other influences emanating from the broader physical and social milieu which have an impact on the developing child are also taken into consideration. He views the environment as a series of nested structures that includes but extends beyond home, school and neighbourhood settings. Essentially an individual's environment consists of four broad levels.

The innermost level, the *microsystem* (p. 22) consists of the activities and relationships within the immediate environment. This aspect of his theory coincides with the more traditional view of one's environment. Bronfenbrenner emphasises that influences within this environment are bi-directional and reciprocal. Children have an impact on their environment just as the environment has an impact on them. Children's biologically and socially determined characteristics influence the behaviour of others in their immediate environment. Environments such as homes and schools, originally perceived to be dominated by the influences of the adults in those settings, are also greatly influenced by children. Thus, a settled, co-operative child is likely to evoke positive and facilitating responses from adults, whereas a hyperactive, distractible, or aggressive child is more likely to evoke a punishing and hostile response. These patterns of behaviour, if established over time, could have an enduring impact on the

developing child. Within this microsystem, other interactions are also likely to have an impact. A supportive and co-operative environment will have a very different impact from an inconsistent and hostile one.

The next level, referred to as the *mesosystem* (p. 209), encompasses connections among microsystems such as home, school, and neighbourhood. Relationships between teachers and parents, or parents and neighbours are likely to influence the child's development. The more links between microsystems, the greater the potential effect on the developing child. Thus, the more positive the relationships between teachers and parents and the more congruent the attitudes and ideals of home and school, the greater likelihood there would be of improved academic outcomes.

The third layer, *the exosystem* (p. 237), refers to formal social settings that influence children's development although the children are not active participants within them. The parents' work settings, social support networks and community-based ties, for example, would constitute part of the exosystem of a child. These settings may be more or less supportive, leading to quite different outcomes for the developing child. A work environment which provides paid parental leave to attend to a sick child is likely to have a positive effect on the child; a stressful or overdemanding workplace is likely to have less positive "trickle-down" effects on the child.

The outermost level of Bronfenbrenner's model is referred to as the *macrosystem* (p. 258) and refers to the values, laws, customs and resources of a particular culture. Democracy, for example, is a principle or belief system which would form part of the macrosystem. Religion, cultural beliefs and political systems would also form part of the macrosystem. Policies regarding child care standards or child support entitlements which would occur as a result of some part of the macrosystem are clearly going to have an effect on the child.

Figure 2.1, (reproduced from Berk, 1991) represents Bronfenbrenner's (1979) ecological model of the environment as a series of nested structures. It portrays how an individual child, such as one with a diagnosis of ADHD, is seen to have an impact on his or her immediate environment, but also on successive layers of the environment. It also reveals how each layer of the environment may be seen to have an impact on the individual child.

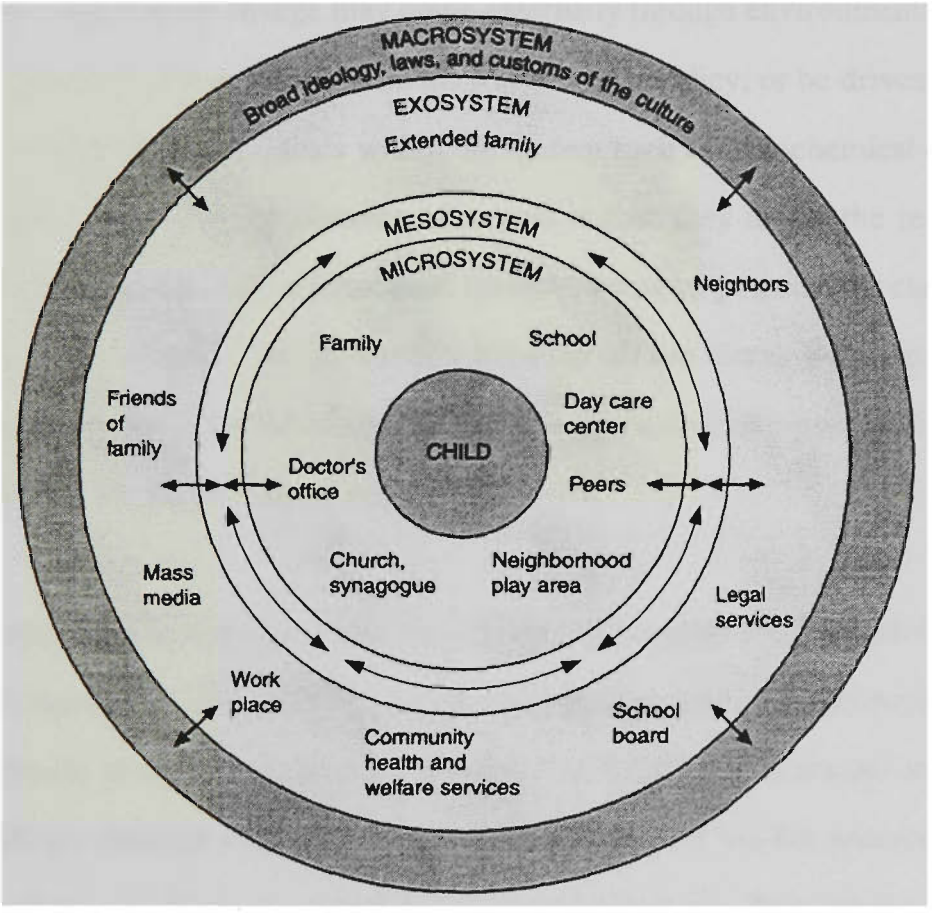

Figure 2.1: Bronfenbrenner's (1979) Ecological Model of the Environment

2.2.1 Significant concepts from Bronfenbrenner's model which are related to this thesis

An additional aspect of Bronfenbrenner's (1979) model is that the various elements of a child's environment are dynamic rather than static. Changes at any level of the system – the birth of a sibling, a new teacher, a newly built child care facility in the neighbourhood, increased financial support through changes in family allowances – will have an impact on the child and bring about changes in his or her environment.

The timing of specific events is also significant. Late onset of puberty can affect the self esteem of adolescents. A new teacher may have more impact on some occasions, for example a few weeks prior to an important external examination, than on others. Bronfenbrenner refers to this aspect of his model as the *chronosystem.*

In his ecological model, it is the interaction of environments and people which is of significance. Impetus for change may come externally through environmental changes such as parental divorce or the implementation of a new policy, or be driven by forces within an individual or individuals within the system such as a biochemical condition. Whatever the origin, the significance of events is that they affect the relationship between individuals and their environment, thereby setting up potential for change. The effect will be the result of the interaction between all the forces within the system. Development is not controlled either by the environment, nor by individual dispositions, but by the interaction of both.

A student with ADHD will affect how the teacher teaches and how other students relate within the classroom. The teacher's organisational strategies, management practices and instructional strategies will all have an impact on the diagnosed student and on other students. Each element within the classroom environment has the potential to have either a positive or a negative impact on every other element. This creates a dynamic system which may prove to be highly beneficial for the diagnosed student, improving his or her educational outcomes. It could also increase the disabling effects of the ADHD condition, resulting in greatly reduced educational outcomes.

2.2.1.i Bronfenbrenner's concept of molar activities and their role in providing motivation and momentum

Bronfenbrenner's notion of a *molar activity* is of particular relevance to this thesis. Bronfenbrenner (1979, p. 45) refers to molar activities as ongoing, purposeful activities which have particular meaning for the participants, such as a conversation or building a

tower. These are differentiated from molecular acts (p. 64), such as knocking on a door or smiling briefly. The particular significance of a molar activity to the individual involved is that it acts as a motivator and provides the activity with the momentum to resist interference, increase perseverance and increase the chances of closure or completion. The greater the meaning of the activity to the participants, the greater the likelihood that it will come to a satisfactory conclusion.

It could be said that the greater the number of molar activities related to classroom instruction, the greater the chance of successful learning outcomes. In classrooms where students regard learning activities as personally meaningful, motivation increases, there is less inclination to be distracted from the activity, and therefore a greater chance that the activity will draw to a meaningful and satisfactory conclusion. This would be particularly important for students who are easily distracted, such as those with ADHD. The provision of personally meaningful and relevant learning activities is perhaps more significant for these students than for students who have less difficulty engaging in classroom activities.

Where there are few personally meaningful learning activities, successful learning outcomes are less likely as there is less motivation attached to the activity, a greater likelihood that attention will be directed elsewhere, and less inclination to complete the activity. This aspect of Bronfenbrenner's ecological model can be related closely to the relationship between learning tasks and a successful learning environment, an aspect of the classroom ecology which will be examined in this thesis.

2.2.1.ii Bronfenbrenner's expanded notion of reciprocal roles and their significance in maintaining stability within systems

The notion of role also features in Bronfenbrenner's model (1979, p. 25). Bronfenbrenner believed that the generally accepted definition of role as *"the behaviour expected of the occupant of a given position or status"* (Sarbin, 1968, cited in

Bronfenbrenner, 1979, p. 85) fails to take into account the reciprocity central to the notion of role within a systems framework and thus requires some modification for an ecological approach. Bronfenbrenner offered the following definition:

> Definition 14
> A role is a set of activities and relations expected of a person occupying a particular position in society, and of others in relation to that person. (p. 85)

The example Bronfenbrenner gives to explain this notion reveals its easy application to a school setting: *"...when a teacher explains, the pupil is expected to listen"* (p. 85). Individuals must be able to fulfil their roles. Teachers must be able to teach. When this does not occur, the system is likely to function less well. If a teacher is unable to fulfil the appropriate role, perhaps because of the impact of particular students, the classroom system will function less effectively as a place of teaching and learning. Roles have a crucial part to play in maintaining the stability of the system.

One hypothesis developed by Bronfenbrenner in his model can be related to roles and their particular relevance to a classroom setting:

> Hypothesis 12
> The tendency to evoke behaviour in accord with expectations for a given role is a function of the existence of other roles in the setting that invite or inhibit behavior associated with the given role. (p. 94)

This hypothesis suggests that some part of a child's behaviour as a "student" is a function of the teacher's ability, and the ability of other people within the system, to facilitate that behaviour. This is highly consistent with Bronfenbrenner's overarching belief in the interactive nature of systems and the fact that each element within a system will have an impact on every other element. It also provides some theoretical explanation of the way in which teachers and peers may contribute to the successful functioning, or otherwise, of a student with ADHD in a classroom. These notions lead

to a central tenet of Bronfenbrenner's theory as it relates to individual development, that of the two person system, or *dyad.*

2.2.1.iii Bronfenbrenner's concept of the dyad and its potential contribution to individual development

The *dyad*, or two person system (1979, p. 5) was one of the most important units of analysis for Bronfenbrenner. Dyads were seen to be critical to individual development.

In his first six hypotheses (pp. 58-60) Bronfenbrenner postulates that an individual's development is enhanced to the greatest extent when two people within a dyad become jointly engaged in an activity, develop positive feelings toward each other, and the relationship between the two is such that the balance of power is gradually transferred to the developing individual, who is afforded increasing opportunity to control the situation. Dyads which meet all these conditions are referred to as *developmental dyads* and are the most powerful in enhancing the development of an individual. Parent and child, or teacher and student, would ideally form developmental dyads. These hypotheses are presented in full in Appendix A.

2.2.1.iv The significance of shared goals between dyads for individual development

Bronfenbrenner also noted the importance of shared goals for positive interaction and development. He refers to an experiment by Sherif (1956, as cited in Bronfenbrenner, 1979, pp. 98-100) in which conflict was turned into harmony through the use of joint activity on behalf of a superordinate goal. Bronfenbrenner quotes Sherif's conclusion:

> Hostility gives way when groups pull together to achieve overriding goals which are real and compelling for all concerned. (p. 100)

The significance of these notions for successful learning is clear. A successful teacher-student dyad would be one in which both members participate in joint teaching/learning activities, where there is a warm reciprocal relationship and the student gradually takes control of the situation as material is mastered. This is summed up in Bronfenbrenner's seventh hypothesis:

> Hypothesis 7
> Learning and development are facilitated by the participation of the developing person in progressively more complex patterns of reciprocal activity with someone with whom that person has developed a strong and enduring emotional attachment and when the balance of power gradually shifts in favour of the developing person. (p. 60)

There are other factors which, according to Bronfenbrenner's model, contribute to or detract from the success of a learning environment. Support may be gained from dyadic relationships which form between one element of the developmental dyad and a third party. Supportive relationships between parent and teacher would thus enhance a developmental teacher-student dyad. Bronfenbrenner expressed it thus:

> Hypothesis 8
> The capacity of a dyad to function effectively as a context of development depends on the existence and nature of other dyadic relationships with third parties. The developmental potential of the original dyad is enhanced to the extent that each of these external dyads involves mutually positive feelings and the third parties are supportive of the developmental activities carried on in the developmental dyad. (p. 77)

Bronfenbrenner's argument is that a student's development would greatly benefit from a relationship of mutual respect and support between teacher and parents. One could argue that this relationship is even more important in the case of students with special needs, such as those diagnosed with ADHD. In these cases a high level of

communication and consistency between home and school environments would provide an environment which supports the child's development, whereas a relationship of mistrust or antagonism could greatly interfere with the child's development.

2.2.1.v The significance of the social climate of a classroom

Hypothesis 19 contributes to an understanding of the importance of the social climate of a classroom in motivating individuals to participate in meaningful classroom activity and to build positive relationships within the classroom setting.

> Hypothesis 19
> The developmental potential of a setting is enhanced to the extent that the physical and social environment found in the setting enables and motivates the developing person to engage in progressively more complex molar activities, patterns of reciprocal interaction, and primary dyadic relationships with others in that setting. (p. 163)

In this hypothesis Bronfenbrenner clearly positions himself on that side of the argument that says social climate is important. When this is applied to an educational setting it is clear that the social climate of the classroom is important in motivating and stimulating students. The social aspect of a classroom may be seen to include the affective relationships within that setting. There is some debate in the literature (to be addressed in Chapter Four of this thesis) as to the relative significance of the affective relationships within a classroom for student learning. Bronfenbrenner's model may contribute to an explanation of this aspect of the ecology of an effective classroom.

2.2.1.vi The significance of collaboration, role compatibility, goal consensus and open communication networks for individual development

In additional hypotheses Bronfenbrenner expanded on the potential benefits of close collaboration between different microsystems, such as schools and families, within the mesosystem. He referred to the significance of compatible role demands and goal

consensus between different settings in facilitating individual growth and development (Hypothesis 28, p. 212, see Appendix A7). Thus, if both classroom and home environments had similar behavioural expectations of a student with ADHD, there would be a greater likelihood of those expectations being met.

Bronfenbrenner also hypothesised that the developmental potential of a setting increased as a function of the number of supportive links that existed between the different microsystems (Hypotheses 34-36, pp. 214-5, see Appendix A8, A9, and A10). Therefore if both mother, father and other members of the immediate and extended family had positive and supportive contacts with the school, the individual student had an increased chance of maximising developmental potential.

Bronfenbrenner set up some boundary conditions on Hypotheses 34 to 36. He postulated that the positive impact of these supportive links would be optimised for people who were in some position of disadvantage or lack of competence, such as the very young, minority groups and people with disabilities. Students with ADHD would fit into a category of disadvantage. As the individual's competence and experience grows, the positive impact of the supporting links would diminish and eventually operate in a reverse direction. Thus, a young teenager travelling to an unknown area would benefit from travelling with a more experienced friend. A new graduate looking for employment, however, may well have more opportunities for development in a totally new environment rather than in the family business.

In an educational context Bronfenbrenner would postulate that supportive links are more critical to the development of less competent students than they are to relatively competent students. This suggests that developing and maintaining close contact with parents and families is even more critical for students who find the demands of a classroom very difficult, such as those students with a diagnosis of ADHD.

Other hypotheses (Hypotheses 39 to 42, pp. 216-217, see Appendix A11 to A14) refer to the need for open, personalised communication networks if individual development is to be maximised. These relate closely to the establishment of supportive links and are particularly important for individuals who are seen to be at risk, such as students with ADHD.

Each of these hypotheses may be relevant to the teaching/learning environment in general and to the educational experiences of a student diagnosed with ADHD in particular. Bronfenbrenner's model of an ecological system in which the nature of relationships among individuals and each level of their environment has some impact on individual development provides a useful framework for exploring the functioning of students with ADHD, their peers and their teachers, in regular primary classrooms.

Thus, Bronfenbrenner's ecological model provides this thesis with a framework for describing and understanding the interaction of students with ADHD and their classrooms. Systems Theory postulates that environments exert an influence on all individuals within it, just as individuals have an impact on the environments or systems within which they operate. There is *"a transactional, not unidirectional, relation between individual organisms and their environments"* (Pelligrini & Horvat, 1995, p. 15). An understanding of the interaction between individuals and their environment and of the reciprocal relationship which exists between them is critical if we are to provide the most meaningful and productive learning environments for students, especially those who are predisposed to failure.

2.3 CHAPTER SUMMARY

Systems Theory has provided a rich explanatory framework within which to explore the nature of the interactions between students with ADHD and their learning environment. In this chapter, important notions from Bronfenbrenner's (1979) ecological model have

been discussed: the concept of a complex and dynamic system of relationships affected by multiple levels of the surrounding environment; the notion of molar activities and their significance in motivating ongoing action; an expanded notion of roles; and the importance of developmental dyads and the relationships extending from those dyads in the realisation of individual potential.

Chapter Three will address the specific nature of ADHD as one of the significant elements that the system needs to accommodate in order to maximise the educational opportunities of students with ADHD.

CHAPTER THREE

THE NATURE OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND ITS CONTRIBUTION TO LEARNING AND BEHAVIOURAL DIFFICULTIES

As stated in Chapter One, Attention Deficit Hyperactivity Disorder (ADHD) has been consistently associated over a period of decades with learning and behavioural difficulties. The core characteristics of ADHD – attention problems, poor impulse control and hyperactivity – appear to combine to prevent a significant number of diagnosed children from engaging successfully in regular educational experiences. A diagnosis of ADHD therefore represents a major threat to a child's learning and progress at school.

There needs to be an understanding of how such individual characteristics impact on the environment in order to guide interventions within that environment that will be meaningful and effective for these individuals. An ecological model of development (Bronfenbrenner, 1979; 1989; 1995), as discussed in Chapter Two, views human development and behaviour in terms of the ways in which individuals' traits and predispositions interact with the multiple layers of the environment in which their lives are embedded. Before examining the reciprocal nature of these interactions, we need firstly to have a clear understanding of the nature of ADHD and the precise ways in which it may predispose a child to failure in the school context. In doing this we are looking at the potential impact of the individual factors in Bronfenbrenner's model. Once some understanding of the effect of individual factors is gained, focus may then be placed on the learning context and those factors which either exacerbate the predisposition to failure, allowing the full expression of behaviours which will detract from success; or alternatively act to suppress those behaviours and facilitate the child's learning.

In this chapter, the nature of Attention Deficit Hyperactivity Disorder and its potential to compromise the learning of diagnosed students is explored. Evidence to support the link between ADHD and learning and behavioural problems is presented.

3.1 THE CARDINAL FEATURES OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND THEIR IMPACT ON LEARNING AND BEHAVIOUR

ADHD is a relatively stable disorder with the predominant features relating to attention difficulties, impulsivity or self regulatory problems, and increased motoric activity or hyperactivity (American Psychiatric Association, 1994). Each of these features has the potential to disrupt the educational experiences of diagnosed students, to contribute to learning difficulties and to militate against acceptable behaviour in the school context.

3.1.1 Impact of attention difficulties on learning and behaviour

The ability to focus on particular aspects of the environment for an extended period of time is referred to as *sustained attention* (Douglas & Peters, 1979; Krupski, 1981; Prior & Sanson, 1986). Difficulties with this are usually indicated by deterioration in performance over time. Students diagnosed with ADHD have difficulty sustaining attention to a target task and have a tendency to switch rapidly from one activity to another (American Psychiatric Association, 1994).

Scruggs and Mastropieri (1992) state that the ability to sustain attention is one of the skills critical to success in the regular classroom. Sustained attention is required to listen to directions, to discriminate relevant from irrelevant stimuli, to process concepts in order to store them in longterm memory, to rehearse items that need to be part of an automatic response, even to copy material accurately from the chalkboard (Douglas & Benezra, 1990; Zentall, 1993). Students with ADHD will have difficulty with comprehension tasks because comprehension requires sustained attention to what is

being read (Nussbaum, Grant, Roman, Poole, & Bigler, 1990; Shaywitz, Fletcher, & Shaywitz, 1992). For example many school-based evaluations, from class-based tests to large external examinations, involve a procedure whereby the students are provided with text, told to read it and answer questions based on the text material. It is just this type of procedure which is likely to present difficulties for a student diagnosed with ADHD (Shaywitz et al., 1992).

Zentall (1993) posits that difficulties with spoken language could result from difficulty in sustaining attention to the covert thought necessary for speech production. Even difficulties with handwriting may result from the failure to attend to the practice required to develop appropriate handwriting skills (Zentall, 1993). While some children with this diagnosis may sometimes maintain attention for extended periods with specific sorts of tasks, they cannot do this with any consistency over a range of tasks.

Students with attentional problems have difficulty in directing and maintaining their attentional processes for long enough to take advantage of observational learning such as that required to learn social skills (Carroll, 1993). Thus, this component of ADHD also puts diagnosed students at risk of developing social difficulties.

A separate but related difficulty experienced by students with ADHD is with *selective attention* : the ability to focus on one stimulus and filter irrelevant or less salient stimuli (Krupski, 1981; Zentall, 1993). Katims (1988), using Ross' (1976) learning paradigm of the characteristics of special learners, noted that selective attention is a significant component of the learning hierarchy:

> Attention can be thought of as the gate through which all experiences must pass in order to be learned. (p. 200)

In order to learn, the individual must scan the stimulus field, locate the relevant dimensions of the task and attend in a sustained manner. Easily distracted, restless and

impulsive students will have difficulty with this component of the learning hierarchy. Countless stimuli constantly impinge on living beings. Attending to every stimulus would mean being totally overwhelmed. Selective attention allows an individual to focus on particular aspects of the environment and is clearly important in a classroom setting. Students are required to focus on such things as the teacher's instructions amid a large number of competing sounds. Students also need to discriminate between subtle differences in letter sounds and configurations in order to learn to read. These are tasks with which students with ADHD often have difficulties (August & Garfinkel, 1989; August & Garfinkel, 1990; McGee, Partridge, Williams, & Silva, 1991; Tant & Douglas, 1982). Listening requires the ability to ignore some stimuli while attending to others. The greater the detail, the greater the chance that students with ADHD will fail to listen and comprehend. Noisy classrooms will hinder these children more than most. This difficulty is exacerbated if a language processing problem coexists with the attention deficit. Students with ADHD have difficulty elaborating when responding without external cues and scaffolding such as pictures or beginning and ending cues (Zentall, 1985; Zentall, 1989; Zentall, 1993; Zentall & Shaw, 1980). Mathematics tasks require both selective attention and sustained attention. All new, complex or unstructured tasks require selective attention, thus difficulties in this area have great implications for educational achievement.

3.1.2 The impact of impulsivity on learning and behaviour

More recent conceptualisations of ADHD have included the notion that poor impulse control rather than attention problems may be the defining characteristic of students with ADHD (Barkley, 1992; Edwards & Barkley, 1997). The ability to delay a response and to tolerate delays within tasks contribute to what Edwards and Barkley (1997) refer to as "*the human powers of objectivity, perspective, logic and rationality*" (p. 15). Individuals without these abilities are likely to respond with greater intensity and range of affect. Delaying a response allows an individual to hold the event in memory for

possible future reference, consider alternative responses, reflect by means of internal speech, and to plan. Responses are then much more likely to be governed by internalised predictions of different alternatives, and to be planned, rather than reactive only to the immediate context. Deficits in these self-regulating skills result in the behaviour characteristic of students diagnosed with ADHD: interrupting, having difficulty taking turns or waiting, and engaging in behaviour without consideration of the consequences, including physically dangerous activities.

Zentall (1993) found that the impulsive cognitive style of students with ADHD impacts negatively on success in the classroom. Academic errors occur because alternatives or consequences are not considered. Such students do not develop effective planning or problem-solving skills because these skills require holding back from action while considering other alternatives. Students with ADHD rarely read instructions before commencing a task nor can they tolerate the delay required in requesting and gaining assistance. Failure to establish routines leads to lost equipment, books and homework. Impulsivity also leads to difficulties in social games as students with a diagnosis of ADHD have difficulty waiting to take turns. Thus, this aspect of ADHD has great potential to disrupt the educational experiences of diagnosed students.

3.1.3 The impact of hyperactivity on learning and behaviour

The component of hyperactivity was once considered to be present in all children with Attention Deficit Hyperactivity Disorder although it is now recognised that some children do not experience this aspect of the condition (Edwards & Barkley, 1997). Hyperactivity is characterised by excessive talking and fidgeting, out-of-seat behaviour, inappropriate running or climbing, and an inability to engage in activities quietly, usually to a highly disruptive degree. This high level of activity occurs across all contexts, in free and restricted play, in social and non-social settings. Such behaviour is clearly not always appropriate in a classroom context, is not conducive to on-task

behaviour in the diagnosed child, and is a distracting element in the classroom for teacher and peers. This leads to impaired academic performance and social rejection. There is also evidence to suggest that the energy required to inhibit motor activity also detracts from academic tasks (Zentall, 1993). Thus, the excessive movement component of ADHD can add considerably to the difficulties of succeeding in the school environment.

3.2 THE INCIDENCE OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND ITS POTENTIAL NEGATIVE IMPACT ON THE SCHOOL ENVIRONMENT

Barkley (1991, p. 2) claims that ADHD is found in *"almost all countries and ethnic groups"* although there are wide variations in the ways in which different countries label, diagnose and treat conditions which have similar characteristics. Pelligrini & Horvat (1995) state that ADHD is related to the British category of EBD (emotional and behavioural difficulties).

Reported incidence rates vary enormously according to the particular definitions and the methods of diagnosis used. Lapouse and Monk (1958) found that up to 50% of male students demonstrated high levels of distractibility and hyperactivity as reported by classroom teachers. In the 1970s, according to Yanow (1973), around 20% of school-aged children presented with these characteristics. An incidence of between 10-20% was still being reported in the United States throughout the eighties (Shaywitz & Shaywitz, 1988; Szatmari et al., 1989).

Better controlled research criteria, definitions and measuring procedures have resulted in the more recent prevalence rates of 3-5% being reported (Barkley, 1991; Carmichael et al., 1997; Fowler, 1992; Lerner, Lowenthal, & Lerner, 1995; Pelligrini & Horvat, 1995; Selikowitz, 1995). ADHD remains, however, one of the most commonly diagnosed disorders of childhood, with boys being overwhelmingly more likely to be

diagnosed by a margin of 3:1 (Barkley, 1991; Pelligrini & Horvat, 1995; Selikowitz, 1995).

Even if we accept only the most conservative estimates of incidence, that is, 3-5% of the school-aged population, it is clear that a significant proportion of students may be considered to be directly at risk of learning failure as a result of ADHD.

3.3 THE COMPOUNDING EFFECTS OF THE COMORBIDITY OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND OTHER DISORDERS

While there has been wide variability in the reported incidence of ADHD, there has been considerable consistency in reports of both learning and behavioural problems coexisting with ADHD. Considering the potential of each of the cardinal features of ADHD to contribute to problems in the school context, as discussed earlier in this chapter, this is perhaps not a surprising outcome. The coexistence of learning and behaviour disorders with ADHD increases considerably the negative impact this condition can have on the quality of educational experiences of diagnosed students and their peers. It is therefore important that the links between them are understood. Studies which are based in the classroom where these problems are manifested, such as the current study, should clarify ways in which the combined effects of ADHD and other disorders may be addressed. Because Bronfenbrenner's (1979) ecological model is particularly concerned with interactions between individuals and their environments, it is a particularly useful one to investigate these relationships.

3.3.1 The link between Attention Deficit Hyperactivity Disorder and learning disabilities

McGee and colleagues (McGee et al., 1989; McGee & Share, 1988) reported that 80% of boys diagnosed with ADHD also had learning disabilities. This figure was supported by research conducted by Silver (1990; 1992). Other researchers have found

consistent patterns of associated difficulties although incidence figures have not been as high. Reading disorders are regularly reported and occur in as many as 30% of these children with an additional 10-15% having other academic disabilities (Sagvolden & Archer, 1989; Shaywitz et al., 1992). Other researchers to report learning disabilities coexisting with ADHD include Shaywitz et al. (1992; 1991), Cantwell and Baker (1981; 1991), Chess and Rosenberg (1974), Halperin et al. (1984), Gualtieri et al. (1983), Love and Thompson (1988) and Trautman, Giddan and Jurs (1990).

Reviews of studies into the comorbidity of ADHD and learning disabilities arrive at similar conclusions: consistency of reported associations but wide variations in actual percentages of coexisting learning difficulties. Hinshaw's (1992) review reported that between 40 and 80% of children with ADHD have been found to exhibit learning and/or achievement problems. The National Health and Medical Research Council Report (1997) reviewed studies in which coexisting learning disabilities were reported in 10-90% of students diagnosed with ADHD.

Perhaps the most reliable data emerge from the review of McKinney, Montague and Hocutt (1993). When stringent identification criteria were applied for both ADHD and learning disability, McKinney found that comorbidity occurred in at least 10-20% of cases, although the prevalence of co-occurrence varied from 9-63% across the studies reviewed. If even the most conservative of these figures is accepted, there are many students diagnosed with ADHD who are experiencing a dual disability.

3.3.2 The link between Attention Deficit Hyperactivity Disorder and behavioural problems

Behavioural problems have also been widely associated with ADHD. Reported problems have ranged from low self esteem and "social difficulties" (Landau & Milich, 1988; Scott, 1987) to poor peer relations (Carlson et al., 1987; Cunningham & Segal, 1987; Grenell, Glass & Katz, 1987; Hubbard & Newcomb, 1991; Milich & Landau,

1982; Pelham & Bender, 1982; Whalen & Henker, 1989) to diagnosed conduct disorders (Carlson et al., 1987; Chess & Rosenberg, 1974; Gualtieri et al., 1983; Loney, 1982; Love & Thompson, 1988; Prior & Sanson, 1986; Reeves et al., 1987; Satterfield, Hoppe & Schell, 1982; Shaywitz & Shaywitz, 1991; Szatmari et al., 1989; Trautman et al., 1990).

The precise nature of the relationships between ADHD, learning disability and behavioural problems has yet to be determined. Whatever the view regarding the precise label attached to the coexisting conditions of attention problems, learning difficulties and behaviour disorders, the links have been well established. The combination of these separate predispositions to learning failure increases greatly the potential negative impact of ADHD. It is imperative, therefore, that appropriate responses and accommodations are made in order to facilitate the learning of these children and to suppress the potential negative effects of the condition. Determining just what an appropriate response might be requires an examination of current treatments or responses and their impact on the behaviour and learning of the diagnosed children.

Treatments are invariably linked to beliefs about how the condition arose. An examination of different explanations of the underlying causes of ADHD and the resulting treatment approaches may assist in making these links explicit. Because this study aims to produce a model for the effective teaching of students with ADHD, knowledge of current conceptualisations and treatments is an important part of understanding why these approaches may not always be successful (Pelligrini & Horvat, 1995).

3.4 PROPOSED AETIOLOGIES OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND CONSEQUENT TREATMENT APPROACHES

As stated previously, a biomedical approach has largely informed our current understandings of the condition ADHD. It is now generally believed to be caused by a variation or a malfunction of the neurobiological system (Barkley, 1990; Carroll, 1993; Ellard, 1993; Goldstein, 1995; Hynd, Hern, Voeller, & Marshall, 1991; Pelligrini & Horvat, 1995), although there are a number of different explanations of the precise way in which this occurs.

3.4.1 The neurochemical explanation of Attention Deficit Hyperactivity Disorder

The neurochemical explanation of ADHD proposes that the behaviours associated with the condition occur because the central nervous system – the brain – cannot produce enough of the family of chemical neurotransmitters called the catecholamines (Zametkin & Rapoport, 1987). Within this group of neurotransmitters the most important for the regulation of attention, inhibition and motor responses are norepinephrine and dopamine. A deficiency in the production of these two neurotransmitters occurs within the brain stem causing decreased stimulation of the cells and thus a dysfunction of the neural pathways (Goldstein, 1995; Hynd et al., 1991). It is the dysfunction of the neural pathways that causes the impulsivity, restlessness and inattentiveness which characterise Attention Deficit Hyperactivity Disorder.

Within a normally functioning nervous system information is passed through the brain by nerve impulses which are transmitted from cell to cell via neurotransmitters. In order for the nerve impulse to cross the synapse (the gap between the cells), chemicals called neurotransmitters need to be released from sacs adjacent to the synapse in the sending cell. The neurotransmitters then bind themselves to the receptor on the next cell

causing it to "fire", and so pass the impulse along to the next cell. Having fired the next cell, the neurotransmitters are deactivated by enzymes within the synapse and most of the chemical material is reabsorbed and stored once more in the original sacs. Autoreceptors on the nerve ending which released the neurotransmitters gauge whether or not there is sufficient neurotransmitter material within the synapse. Excess material binds to the receptor cell while more is produced if insufficient quantities are detected (Hynd et al., 1991; Parker, 1992).

Problems may occur during any or all of these steps. There may be inadequate release of the neurotransmitter material, it may not break down sufficiently, or faulty feedback mechanisms may cause difficulty in regulating the amount of neurotransmitter material in the synapse. Any one of these problems will result in a reduced ability to maintain the integrity of the message being sent along the nervous system. Messages aimed at controlling impulsivity, sustaining attention or monitoring behaviour cannot be transmitted (Hynd et al., 1991; Lerner et al., 1995; Parker, 1992).

The effect of psychostimulant medication adds support to the neurotransmitter theory of ADHD. Psychostimulant medication increases the production of norepinephrine, thus normalising the levels of neurotransmitters and allowing them to perform their function of moderating impulses and monitoring attention. Levels of norepinephrine can be measured through tests of blood, urine and cerebrospinal fluid. Clinical studies have revealed that before taking medication, individuals with ADHD have reduced levels of norepinephrine in the brain stem. After medication, the norepinephrine levels are normal (Hunt, Mindarra, & Cohen, 1985; Hynd et al., 1991; Pelham, 1990).

3.4.2 Proposed immaturity in brain development

There is some support for the view that the lack of neurotransmitters is due to a basic immaturity in brain development (Carroll, 1993; Hynd et al., 1991; Selikowitz, 1995),

rather than a dysfunction per se. Selikowitz likens the maturing brain to maturation of any other part of the body. Maturation allows the individual to gradually develop skills and accomplish tasks of increasing complexity. When any skill is being learned there is a period of time during which the skill can only be performed poorly or inconsistently. Gradually the skill is refined so that it may be performed consistently and well.

Maturation of the brain allows for the production of increasing amounts of neurotransmitters which in turn allows for increasing control over the executive functions of sustained attention, self regulation, self organisation, co-ordination of movement, reflection, and so on. In some individuals, this maturation does not take place, or takes place very slowly, and thus the developing child is left with a reduced ability to sustain attention, control impulses, and inhibit inappropriate movement. The inconsistency of performance noted in many individuals diagnosed with ADHD may be the result of newly acquired skills not yet mastered to the point where consistency of performance is possible. Neuro-electrophysiological studies have demonstrated that the brain function of individuals with ADHD is immature, but also that these abnormalities are greatly reduced when medication is administered (Lerner et al., 1995).

3.4.3 Proposed differences in brain structure

Newly developed technology is allowing increasingly sophisticated research into the function of the brain. Magnetic resonance imaging (MRI) produces video images of different sections of the brain, and can reveal the shape and location of various brain structures. Some individuals with ADHD have been shown to have smaller frontal regions of the brain than normal individuals (Hynd et al., 1991).

Positron emission tomography (PET) measures metabolism within the brain and has established that individuals with ADHD metabolise less glucose in the brain than regular individuals (Zametkin & Rapoport, 1987). Zametkin's research has provided the most

compelling evidence to date of a biological basis to attention deficit disorders. PET technology is also capable of mapping the areas of the brain which are active at any particular time and which are most affected by the reduced glucose levels. Zametkin found that sections of the premotor strip that control purposeful movement and areas of the frontal lobe which contribute to impulse control were most affected. These relate directly to observable features of Attention Deficit Hyperactivity Disorder.

While differences in brain structure do not appear in all children diagnosed with ADHD, as advancing technologies allow more detailed examination of the active brain, more definitive answers may be derived from this avenue of research.

3.4.4 Genetic factors

Neurobiological explanations of attention deficit hyperactivity disorder suggest that genetic factors may be important. Family history and twin studies provide strong support for this viewpoint (Barkley, 1990; Cantwell, Baker & Mattison, 1981; Faraone et al., 1993; Friedman & Doyal, 1992; Goodman & Stevenson, 1989; Levy, Hay & McLaughlin, 1996; Levy, Hay & McStephen, 1997; Parker, 1992).

3.4.5 Other proposed causes

3.4.5.i Dietary factors

The Feingold Diet which controls for certain additives was a popular response to this disorder in the seventies (Carroll, 1993; Forness, Kavale, Blum, & Lloyd, 1997) in response to the notion that ADHD was the result of an allergic reaction to certain preservatives. Research suggests a very small percentage (less than 5%) of children diagnosed with ADHD may be affected by artificial dietary additives and so benefit from this diet (Carmichael et al., 1997; Carroll, 1993; Forness et al., 1997; Levy, Dumbrell & Hobbs, 1978).

Some children with ADHD are said to have a genetic abnormality that requires greater doses of nutrients than the regular population would need. Treatment involves megadoses of vitamins which carry the risk of toxicity and side effects. Other children with ADHD have been treated with hypoglycaemic diets, based on the belief that sugar overload leads to an increase in hyperactive behaviour. There is no clinical evidence of the success of these methods (Carmichael et al., 1997; Carroll, 1993; Forness et al., 1997).

There are still advocates for a diet-controlled response to ADHD. Dengate (1997) claims that early research failed to eliminate sufficient problem-causing foods and did not recognise the validity of parental observations which supported great improvements when certain foods were eliminated from the diets of children with ADHD. There remains, however, a dearth of scientific evidence to support claims that ADHD can be controlled through diet alone.

3.4.5.ii Environmental factors

Barkley (1990) claims that ADHD can also be related to pregnancy or birth complications, or can develop from disease or trauma to the central nervous system. External environmental factors may also be of significance. Certain contexts appear to be more problematic for these children than others. School environments which require sustained attention to unstimulating or repetitive tasks, chaotic or disorganised home environments, child abuse and neglect can exacerbate the difficulties these children face (Carroll, 1993), but there is no convincing evidence that the external environment per se is a causal factor (Barkley, 1990).

3.4.6 Summary of proposed aetiologies

There is increasing evidence for an organic base to ADHD with perhaps greater support for a neurochemical explanation rather than explanations based on neurodevelopmental

delay, differences in brain structure, or food allergies. Damage to the central nervous system as an outcome of trauma or disease has been implicated by Barkley (1990). Environmental factors are seen to exacerbate symptoms but there is no evidence that environmental factors are causal.

The extent to which the classroom environment may exacerbate the symptoms of ADHD is one of the key questions which this research seeks to answer. Bronfenbrenner's ecological model suggests that the classroom environment would be a major influence on a child's development and behaviour and that examination of that environment is essential if behaviour is to be understood. While factors within the individual may give rise to difficulties in the classroom context, Bronfenbrenner's (1979) model would suggest that environmental influences also shape the individual's behaviour and that focusing exclusively on the child factors will result in only a limited understanding of the behaviour.

3.5 EMERGENCE OF CURRENT TREATMENTS IN RESPONSE TO BIOMEDICAL EXPLANATIONS

3.5.1 Pharmacological approaches

A medical or biomedical view of the aetiology of ADHD, as discussed in the previous section, has particular implications for the treatment or intervention approaches used. Locating the source of the disorder in the neurological or neurochemical constitution of the child implies a pharmacological approach to the problem (Young-Loveridge, 1997). Indeed, drug therapy is the most widely used of all treatments in children diagnosed with ADHD (although not prescribed for children under three years of age). Such approaches are seen to be effective in approximately two thirds of cases (Barkley, 1990; Barkley, 1992; Carroll, 1993; Cooper & Ideus, 1995; Edwards & Barkley, 1997; Ellard, 1993).

The most common treatments involve the stimulants Ritalin (methylphenidate) and Dexedrine (dexamphetamine sulphate). The effect of these drugs is to increase neurotransmitter levels to within the normal range allowing the individual to better control impulsivity and monitor attention and movement more appropriately. These medications are short acting, taking effect within one hour and losing effect after three to four hours (Barkley, 1990).

Other drugs which have been used more recently include Tofranil (impramine) which tends to reduce oppositional behaviour as well as improve concentration and decrease impulsivity (Selikowitz, 1995), although some children develop a tolerance for it and thus the effects are reduced. Children who manifest oppositional behaviour in addition to other symptoms of ADHD are often prescribed Melleril (thioridazine) and Clonidine, which is occasionally used in combination with Ritalin. Aurorix (moclobemide) is an antidepressant which is occasionally prescribed for children with ADHD (Selikowitz, 1995).

The effects of these drugs, particularly Ritalin, have been closely examined (Carmichael et al., 1997; Levy, 1993). Common side effects are loss of appetite, weight loss and sleep disturbances. Less common side effects include headaches, increased heart rate, abdominal discomfort, depressed affect, irritability and slower growth rates. Children who are prone to tics (Tourette's Syndrome) may experience increases in this activity when on Ritalin. There is no evidence of addiction because of the extremely small quantities prescribed for children.

3.5.1.i The limited effects of stimulant medication

From as early as 1937 stimulant medication has been found to reduce the behaviours associated with ADHD (Barkley, 1990; Barkley, 1992; Douglas et al., 1986; Gittelman et al., 1983; Kripner, Silverman, Cavallo, & Healey, 1973; Pelham, 1993; Pelham et

al., 1997; Rapport et al., 1985) and to increase academic productivity and social adjustment (Pelham, 1993; Pelham et al., 1997; Rapport et al., 1985).

Studies examining the direct relationship between stimulant drugs and academic achievement in the areas of reading, mathematics and spelling have resulted in, at best, *"modest"* relationships (Connors et al., 1969; Gittelman et al., 1983; Pelham et al., 1985), and in most cases, no significant relationships (Barkley & Cunningham, 1978). Barkley and Cunningham (1978) reviewed eleven studies of stimulant drugs and academic achievement and found only one that reported significant drug effects. Ten of the eleven studies reported no improvement, which is disturbing in view of the fact that the increased attention span and work output now consistently associated with stimulant medication could reasonably be expected to result in at least minimal improvements in academic performance. More recent reviews have had similar results. Gadow and Pomeroy (1991) state:

> Collectively, the findings from a number of investigations suggest that the academic achievement test gains associated with stimulant drug treatment are not particularly robust, long-lasting, or cumulative, which is not to say that they are non-existent. (p. 370)

A major criticism of the use of drug therapy is that it may encourage an externalising of responsibility of behaviour (Grainger, 1997). The initial teacher or parent response to inattentiveness or poor behaviour may be, "Did you take your medication this morning?" rather than a specific directive regarding behaviour which is how other children are managed. Thus other children are expected to exert some control over their behaviour but medicated children are encouraged to believe that they need to be controlled by medication.

Stimulant medication has certain effects which can contribute to improved learning potential but a poorly managed environment may lead to some dilution of the effect of the medication (Pelham, 1993; Pelham et al., 1997). The fact that stimulant medication, the most widely recommended response to ADHD, has such limited effects on educational outcomes suggests that different, or added, treatment components are needed in order for these students to achieve academic success. This has led to the recommendation of multimodal responses.

3.5.2 Recommended multimodal responses

While most researchers support the use of stimulant medication where it is necessary to control the behavioural symptoms of ADHD, there is now wide recognition that medication effects on academic performance may only be manifested when accompanied by specific academic or behavioural interventions (Gadow, 1985; Gadow & Pomeroy, 1991; Gittelman et al., 1983; O'Leary, Pelham, Rosenbaum, & Price, 1976; Pelham, 1993). In 1987 the American Academy of Pediatrics Committee on Children with Disabilities and Committee on Drugs issued a statement that stimulant medication should not be used as an isolated treatment for ADHD (as reported in Evans et al., 1995). The current view is that drug therapy alone is not sufficient but can be useful as part of a multimodal approach (Carmichael et al., 1997; Purvis, Jones, & Authement, 1992).

A brief discussion follows of other treatments which have been used both alone and in conjunction with drug therapy in efforts to ameliorate the learning and behavioural difficulties associated with ADHD. It is important to review existing approaches when attempting to develop a model of effective teaching which will address the needs of students with ADHD.

3.5.2.i Behaviour modification programs

The use of token economies, contingency management programs and highly structured programs in conjunction with psychostimulant drugs is widely employed and has led to demonstrated improvements in academic performance and behaviour (Carroll, 1993; Evans et al., 1995; Forness et al., 1997). The research evidence suggests that the *multimodal* aspect of these programs is critical in that combined approaches have been found to be significantly more effective than single approaches. Although there is some support for the use of behavioural programs without drug therapy (Fiore, Becker, & Nero, 1993), behavioural programs conducted in conjunction with drug therapy have had more successful outcomes (Lerner et al., 1995; Shaywitz, Fletcher & Shaywitz, 1995; Swanson et al., 1993).

3.5.2.ii Cognitive behavioural therapy

Self-reinforcement, self-monitoring, self-evaluation, and anger-management programs developed out of cognitive behavioural approaches to behaviour management. These programs have had mixed success. Some researchers have found improvements in off-task/disruptive behaviour if the programs are conducted over an extensive period of time (Carpenter, 1995). Other researchers have found no differences (Carroll, 1993; Green cited in Gomez & Cole, 1991; Hudson, 1997). These programs are highly time and labour intensive, factors which must be closely considered if minimal gains are made.

3.5.2.iii Parent training

Basic parenting programs, self-instructional programs, and instruction in use of praise and attention to modify child behaviour have been found to be superior to medication alone in improving task completion, self control, school adjustment, communication, hostility levels, and parental stress levels (Carmichael et al., 1997; Carpenter, 1995;

Estrada & Pinsoff, 1995; Pisterman et al., 1992; Purvis et al., 1992; Sheridan, Dwyer, & Sanders, 1997). In some studies these improvements have been in parents' and child's opinions only, with little difference in clinical ratings, but these are nevertheless considered to be significant effects. The involvement of parents in reward programs (for example, providing a reward at home for some aspect of improved school performance) has been found to be effective.

3.5.2.iv Social skills training

Social skills training as an adjunct to other behavioural interventions has been found to be very effective in improving peer relations and general social skills (Askew, 1993; Carpenter, 1995; Carroll, 1993; Fiore & Becker, 1994; Forness et al., 1997; Grenell et al., 1987; Landau & Milich, 1988; Schwean et al., 1993; Scruggs & Mastropieri, 1992). Carroll (1993) found that social skills training may be particularly valuable for these students, as social development relies heavily on individuals imitating the behaviour of others. Students with attention problems have difficulty in directing and maintaining their attention processes for long enough to take advantage of observational learning: they need to be taught these skills specifically.

3.5.2.v Summary of multimodal responses

Behavioural programs have been found to be consistently successful in improving the behaviour and learning of students with ADHD, as have parent training programs and specific social skills instruction. Less consistent success has been reported with the implementation of cognitive behavioural programs.

The core features of ADHD which include attention problems, impulsivity and hyperactivity all pose a threat to the diagnosed child's educational success. ADHD is so often combined with other problems, such as learning difficulties and behavioural problems, that it clearly impacts negatively on the child's potential to learn. Drug

therapy alone is not enough to counteract the negative effects of ADHD on educational success. It is logical that a focus on the proposed neurological aspects of the condition has resulted in an emphasis on drug-related treatments. It is also clear that additional responses are necessary if the educational potential of these children is to be realised.

Of significance to this study is the fact that research such as that of Pelham et al. (1985; 1990; 1993; 1997) suggests that, while stimulant medication may be useful in moderating the impact of ADHD on the educational setting, the environment can either increase or diminish the impact of medication. Multimodal concepts suggest the need to look beyond a singular response to a more extended view of addressing the potential problems facing students diagnosed with ADHD.

This thesis has responded to the challenge of exploring what is most effective in producing successful educational outcomes for students diagnosed with ADHD through a longterm classroom-based examination of their behaviour in different classroom settings. Thus, it acknowledges some of the environmental influences which Bronfenbrenner (1979) highlights as being crucial to the development of all children. A classroom-based study will also assist understanding of the forces acting on students' development and aid the formulation of recommended practices specifically suited to their needs.

3.6 THE RELATIONSHIP BETWEEN ATTENTION DEFICIT HYPERACTIVITY DISORDER AND THE LEARNING ENVIRONMENT

Bronfenbrenner (1979) believes that behaviour cannot be divorced from the context in which it occurs. Environmental influences constantly act upon individuals just as individual responses exert an influence on the environment. An understanding of individual predispositions to certain behaviours is not enough. It is also necessary to have an understanding of the way in which the behaviours of people around them (for

example, other students and teachers) and of other environmental influences such as the physical arrangement of the room and the nature of the instructional tasks interact with, and have an impact on, the individual students.

Pelligrini and Horvat (1995) point out that the typical management strategies used by teachers such as reasoning, ignoring poor behaviour and various forms of punishment, are not useful with students who have difficulty in sustaining attention, remembering, and engaging in reasoned reflection. They also highlight the fact that most referrals for diagnosis occur in the early primary grades when a more sedentary and confined behaviour is expected of students who may be unable to match their behaviours with the demands of the environment. In their words:

> Developmental contextualism posits a transactional, not unidirectional, relation between individual organisms and their environments....Children's functioning in school is the result of within-individual factors being embedded within specific school systems. (p. 15-16)

The authors acknowledge the work of Cooper, Smith and Upton (1994) when they say:

> Notions of individual "maladjustment" that see the problem behaviour as resulting from individual disorder or disturbance...have given way to a preference for environmental explanations that see a child's adjustment difficulties in terms of social and psychological effects of hostile circumstances....If we get the curriculum right, if we get the school environment and ethos right, and if we get the relationship between staff and pupils right, then we will go a long way to preventing and alleviating [poor behaviour] in schools. (p. 32)

This provides strong support for an ecological view to be taken of influences on a child's behaviour. Rather than using a questionable label, a more functional approach is one wherein the difficulties of any child are related to a misalignment between the

child and the nature of the curriculum and/or instruction and/or school organisation. For these reasons, this thesis will now examine the ecology of a classroom learning environment.

3.7 CHAPTER SUMMARY

This chapter has examined the core features of ADHD and ways in which they are perceived to affect learning and behaviour. Reported incidence rates of ADHD have varied considerably over the past three decades, with recent reports putting the prevalence rate at 3-5%. The compounding effects of comorbid learning and behavioural problems are seen to increase the negative impact this condition can have on the quality of educational experiences of diagnosed students. Proposed aetiologies of ADHD and subsequent treatment approaches have resulted in a recognition that multimodal approaches appear to have the most desirable outcomes. Multimodal approaches require an understanding of how environmental factors may contribute to the difficulties of these students, or combine to reduce the negative impact their diagnosis may have. Chapter Four will examine a range of elements within the classroom environment that may have an effect on the learning of these students.

CHAPTER FOUR

THE ECOLOGY OF THE CLASSROOM AND ITS POTENTIAL IMPACT ON LEARNING AND BEHAVIOUR

From a review of the literature regarding ADHD some understanding has been gained of the impact this condition can have on diagnosed students and of the individual or within-child factors that may, according to Bronfenbrenner's (1979) model of development, contribute to learning and behavioural problems. According to his ecological model, any examination of student behaviour needs to look at both the individual student and the surrounding environment and more importantly, the interaction between the two. An exploration of classroom factors which may either exacerbate or counteract the predisposition to school difficulties should facilitate an understanding of the interrelationships between individuals and their classrooms. In this chapter, the immediate environmental factors – that is, those factors operating within the classroom which have been associated with successful learning outcomes – will be discussed in order to expand an understanding of how these may be matched with the needs of students diagnosed with ADHD.

4.1 A DEFINITION OF LEARNING FOR THIS THESIS

Before proceeding with the discussion of the classroom as an ecological system, further explanation is required of the definition of *learning* which will be used in this thesis. The construct of learning encompasses much. Advocates from two major schools of thought, the empiricists and the nativists, have been debating how learning occurs for centuries (Adams, 1990). The empiricist view of learning is that a knowledge base develops as a result of experiences, and that these experiences are derived strictly from the senses (see McLelland & Rumelhart, 1986). Learning is defined as the development of concepts through the classical principles of association (contiguity,

recency, frequency and similarity). In this way categorical knowledge is acquired about the objects and events in our environment and about their forms, their uses and their contexts. As our experiences increase we are able to make increasingly sophisticated judgements about closely connected concepts. Some concepts are abstract, and therefore not acquired through direct experiences (see Miller and Dollard, 1941). In such cases, we acquire widely accepted labels which allow us to organise our individual developing conceptual notions and share them in a communally accessible manner.

Nativists, in contrast, contend that what is known transcends what can be sensed. They agree that knowledge is built from experience, but only as the elements of that experience are selected, structured and interconnected by the individual in accordance with his or her own fundamental interpretive predispositions.

A constructivist approach offers a bridge between the empiricist and nativist views of knowledge. Learning is viewed as "the product of self-organisation" (von Glaserfield, 1989, p.136). Constructivists agree that learning accrues through experience, and that our perceptions are indeed received by innate sensory transducers and detectors. Constructivists argue, however, that knowledge is actively constructed by the learner rather than passively received. We remember not just central sensory events, but total contexts, including our individual responses to those sensory events. In this way what we learn becomes organised in uniquely individual ways. Because all learning is mediated by individual nervous systems, and thereby affected by individual differences in speed or organisation of response, disposition towards attention, impulsivity, and so on, each response to a potential learning situation will inevitably be unique. Individual responses will differ according to what memories, feelings, attitudes, contexts, and so on that the new stimulus activates within the existing system.

Within the constructivist framework, learning is also seen to be the result of *activation.* (Koffka, 1931). Such activation may be directly evoked by an outside stimulus, such

as when a familiar item is encountered; it may be indirectly activated when an experience is similar to one previously encountered; or it may be activated from within when, for example, reflection on knowledge occurs. When reflection occurs, attention is turned from one memory to another, comparisons or contrasts may be made, new associations may be created and perceptions may be reorganised. This reflection or perceptual reorganisation therefore results in learning which is not the result of outside stimuli – in insight or creativity.

Although acknowledging that learning most certainly includes notions of creativity and insight, it is not the intention of this thesis to investigate these notions. For the purposes of this thesis classroom learning is defined as *academic gains in basic skill areas,* the definition which is used throughout most of the effective teaching literature (Christenson, Thurlow, & Ysseldyke, 1987; Rosenshine & Stevens, 1986). This is admittedly a very narrow definition of learning, and one which leans uncomfortably towards an empiricist's view of learning. This definition does, however, have some redeeming qualities in a study set in primary classrooms.

A significant function of primary schools is to develop the basic literacy and numeracy skills of children. Thus, examining how this particular aspect of learning is best achieved is a valuable exercise, particularly in a study examining classroom practices in primary classes. Moreover, while the term *academic gains* presents some definitional problems it is more easily defined than some of the more esoteric aims of primary education which are often espoused, such as developing citizenship, or assisting children to reach their potential.

4.2 THE CLASSROOM AS AN ECOLOGICAL SYSTEM

Classrooms, as noted in Chapter Two, may be viewed as ecological systems in which there is constant interaction of the environment and its inhabitants or members. A classroom would be regarded by Bronfenbrenner as one of the microsystems in which a student's life is embedded. In addition to having the defining qualities of a system, classrooms also have quite distinct properties which must be appreciated if their potential impact on the individuals within them is to be understood.

4.2.1 The properties of classrooms and their potential effect on students with ADHD

According to Doyle (1986), classrooms have distinctive properties. These properties exist in all classrooms, whether they contain a kindergarten or senior class, whether the teacher is highly formal or informal in orientation and teaching style, and whether initial reading or advanced physics is being taught.

Classrooms, according to Doyle, are *multidimensional.* There is firstly a complex human dimension consisting of people with differing abilities, personalities, skill levels, and inclinations towards learning. Classrooms are also full of objects: furniture, resources and student belongings in varying conditions and degrees of order. Classrooms have a task dimension, with tasks differing in nature, level of demand and interest. The multidimensional aspect of classrooms alone makes them potentially difficult for the student with ADHD.

A related classroom characteristic is *simultaneity.* Many different activities coincide and/or overlap. Classroom activity may be interrupted at any time by questions, messages at the door, malfunctioning equipment, the need to redirect an off-task student, or any number of other things. The teacher and students respond and react in an environment in constant motion.

This leads to what Doyle refers to as *immediacy*. Decisions need to be made quickly in response to the rapid pace of classroom interactions. Situations and moods can change quickly and often require on-the-spot decision making and action.

The immediacy of a classroom is related to its *unpredictability*. The potential for something unexpected to occur is high in such a multi-faceted environment. Even the best-prepared classroom cannot predict an event such as a child suddenly having a seizure and the consequent responses on the part of other students to that event.

Classrooms are also very *public* places. Many students witness how individual infractions, disagreements and so on are managed. The public nature of classrooms brings its own pressures and exerts particular influences within their ecologies.

Finally, Doyle states that classrooms and the individuals within them have *histories*. Events, attitudes and responses are usually dependent upon events, attitudes and responses which have occurred in the past. A tardy student who has never been late before will receive a very different response from that given to a chronic truant.

Each of the characteristics discussed could pose difficulties for a student with ADHD. Classrooms could present for them a bewildering array of complex and potentially distracting elements. These elements increase the likelihood that students with ADHD will fail to attend to what is salient, fail to remain on task and fail to complete set tasks. It is precisely the ways in which students diagnosed with ADHD do respond to each of these characteristics and the impact these responses have on their educational experiences that this thesis will pursue.

Nevertheless, despite the complex and multi-faceted nature of classrooms, teaching and learning do occur within them. Most would agree that some classroom ecologies are more effective than others at facilitating these processes. The focus of this chapter is on

those particular classroom factors which are most significant in augmenting the learning experiences of students, particularly those diagnosed with ADHD who are in many ways "programmed" to fail.

Bronfenbrenner's ecological model (1979) reminds us that elements at many different levels will have an impact on classroom behaviour and learning. The practical constraints on a thesis, however, mean that some limitations must be set regarding what will be examined, both in terms of the related literature and the focus of the study. Bronfenbrenner himself (1979) states that all the relevant factors cannot be examined within a single study:

> It is important to emphasise in this connection that it is neither necessary nor possible to meet all the criteria for ecological research within a single investigation. Provided the researcher recognises which qualifications are met and are not met, useful scientific information can be gained. (p. 14)

In this chapter attention will centre on the microsystem of the classroom and the classroom and teacher factors which contribute to learning, although it is recognised that factors from other levels of Bronfenbrenner's ecological model have an impact on the ecology of a classroom. Particular focus will be on the following aspects of the learning environment:

- the link between academic engaged time (AET) and learning, as learning has been linked over a period of several decades with academic engaged time and this is an area of concern for students with ADHD;
- classroom practices linked to AET, to determine how AET may be increased;
- the link between classroom practices and academic achievement in order to identify other factors related to academic achievement;
- recommended teaching practices for students diagnosed with ADHD, to determine how these relate to effective teaching practices for regular students,

and to what extent (if any) teachers may need to change their practice to teach students with ADHD successfully;

- the nature of classroom tasks and their relationship to learning, particularly for students with learning difficulties;
- the significance of the emotional climate of the classroom because there is conflicting evidence concerning the role of this factor in the effective teaching literature; and
- the concept of *alliance* which has emerged from the psychotherapeutic literature as one explanation of how effective teachers operate.

4.3 THE LINK BETWEEN ACADEMIC ENGAGED TIME AND LEARNING

The notion that academic achievement is related to time spent engaged in the learning process has played an important role in the development of several proposed models of classroom learning (Bloom, 1974; Carroll, 1963; Fisher et al., 1980; Harnischfeger & Wiley, 1976; Rosenshine & Berliner, 1978). How time is used in schools is significant because it is essentially a variable that teachers can control. While the aspect of time and its relationship to classroom learning has been of interest to researchers since the early 1930s (Smyth, 1985), it was during the late seventies and early eighties that most research was conducted in this area.

Possibly the most extensive and influential study of engaged time was the Beginning Teacher Evaluation study (BTES) conducted at the Far West Laboratory for Educational Research and Development in San Francisco (Fisher et al., 1980). This study was originally devised to identify teaching activities and classroom conditions that promoted academic achievement. During the project a measure of student learning was developed using observable student behaviour which led to the concept of Academic Learning Time (ALT). ALT was defined as the amount of time a student spent engaged in an academic task that he or she could perform with high success. It was conceived as

having three elements: allocated time, engaged time and success rate. Engaged time represented a more refined measure than allocated time because students may not have been academically engaged throughout the entire allocated period. Similarly, periods of few errors and high success within engaged time suggested greater understanding than periods of high error rates and were therefore seen to represent an even more accurate measure of learning. According to the BTES model, the more ALT, the more a student is learning.

As the BTES study progressed a model of classroom instruction and student learning evolved. This model provided a conceptual framework for subsequent research on what became known as academic engaged time (AET) and its relationship to student learning. AET, rather than ALT, became the variable used more often in subsequent research, perhaps because of the greater ease and practicality of measurements of time alone, as opposed to measures of success.

Engagement time clearly does not measure student learning directly but studies over the past three decades have consistently shown that one of the best predictors of student achievement is the opportunity for the learner to be actively engaged in a task (Angus, Evans & Parkins, 1975; Bloom, 1974; Brophy & Good, 1986; Bulgren & Carta, 1993; Cannon, Idol, & West, 1992; Christenson et al., 1987; Cobb, 1972; Cooper & Speece, 1990; Fredrick & Walberg, 1980; Greenwood et al., 1990; Greenwood, 1991; Haig, 1987; Kamps et al., 1991; Lahaderne, 1968; Logan, Bakeman & Keefe, 1997; Marshall, 1976; McDonnell, Thorson, McQuivey, & Kiefer-O'Donnell, 1997; Pisarchick, 1989; Rosenshine & Berliner, 1978; Samuels & Turnure, 1974; Sindelar et al., 1989; Stallings, 1980; Stallings & Kaskowitz, 1974). This link has been established:

- on standardised as well as informal tests (Fredrick & Walberg, 1980);
- across varied subject matter (Evertson, Anderson, Anderson, & Brophy, 1980; Fredrick & Walberg, 1980; Rosenshine & Berliner, 1978; Samuels & Turnure, 1974);

• for students of varying ages and levels of schooling (Brophy & Evertson, 1976; Evertson et al., 1980; Fitzpatrick & McGreal, 1983; Harnischfeger & Wiley, 1976; Lahaderne, 1968; Pisarchick, 1989; Stallings & Hentzell, 1978);

• for regular students (Derevensky, Hart & Farrell, 1983; Graden, Thurlow & Ysseldyke, 1982; Thurlow, 1983);

• for students with mild disabilities (Bulgren & Carta, 1993; Marston et al., 1995; Thurlow et al., 1983);

• for students with severe or multiple disabilities (Christenson et al., 1987; Hollywood et al., 1995; Logan et al., 1997); and

• has been found to be a better predictor of achievement than the socioeconomic status of the student (Derevensky et al., 1983).

4.3.1 Students with learning problems and reduced academic engaged time

Research into the amount of time students with learning difficulties spend engaged in classroom activity supports the view that these two elements are closely related, as percentages for learning disabled students fall consistently below that of their non learning disabled peers.

Sullivan (1988 as cited in Marston, 1995) found in her sample that students with learning disabilities averaged 20-35% AET while regular students averaged at least 40%. Thurlow et al (1983) found that students with learning difficulties spent an average of 45 minutes per day or only 16% of the time available academically engaged. Allington & McGill-Franzen (1989) and Haynes and Jenkins (1986) reported that low-performing students spent approximately two thirds of their reading periods engaged in non-reading activities. Gelzheiser and Meyers (1991) and Haynes and Jenkins (1986) reported that students with mild disabilities spend up to 70% of their time waiting, off task, or passively watching and listening to the teacher with little or no opportunity to respond. McDonnell et al (1996) found that, on average, disabled students were

engaged only 32% of the time, although their non disabled peers in the same classroom fared little better at 37% AET. Krupski (1980) also found that children with a variety of learning disabilities spent less time on tasks of an academic nature than their non-disabled peers.

4.3.2 The distinction between academic engaged time and time on task.

The terms *academic engaged time* and *time on task* are used virtually synonymously in some reported research (Derevensky et al., 1983; Graden et al., 1982; Thurlow et al., 1989). For the purposes of this thesis, however, a distinction is made between the two (see Greenwood & Delquadri, 1988).

A student may be considered to be on task when he or she is doing what is required by the teacher at that time. That may include lining up, returning equipment, cleaning up after a practical activity or waiting for the next activity to begin. None of these activities would constitute academic engaged time, but all are important in that they facilitate the smooth functioning of the learning environment. It is in situations of this nature that students with ADHD have a great deal of difficulty in remaining on task, and may cause significant disruption leading to protracted transition periods and loss of learning time for themselves and often for their peers. If students with ADHD are able to co-operate in these "down times", their impact on the classroom is greatly reduced. It is therefore important when examining the behaviour of students with ADHD to take note of when they are simply doing what is required of them in addition to noting when they are actively engaged in learning tasks. A clearer picture then emerges of how they interact in the classroom.

Academic engaged time may be seen as a subset of time on task. For the purposes of this thesis, a student was considered to be academically engaged if he or she was actively engaged in oral or silent reading, writing, computing, manipulating objects

relevant to task completion, or engaged in verbal behaviours related to an academic task. Behaviours such as listening to a story were classified as *on task* but not as *academically engaged.* This is because it was virtually impossible to determine if the student was actually listening. Calculations of academic engaged time in this thesis, therefore, may err on the conservative side. A more detailed discussion of the distinctions made between these two terms, and also of behaviours considered *off task*, has been included in the methodology section.

4.4 CONCLUSIONS OF TIME-BASED RESEARCH AND ITS RELATIONSHIP TO LEARNING

Research based on the notion of academic engaged time has been criticised on a number of grounds (Christenson et al., 1987). It can draw attention away from the quality of learning; that is, "busywork" can result in high levels of academic engaged time. Large increases in time allocation may be necessary for quite modest gains in learning (Maggs & Morgan, 1986) and variations in the strength of the relationship between time spent and learning have been reported (Christenson et al., 1987). Nevertheless, the positive relationship between engaged time and achievement has been well established. As Gettinger (1986) reported:

> Despite some methodological and measurement flaws in the time-and-learning research, a fairly consistent conclusion has emerged: academic engaged time is related to student achievement. (p. 14)

Once the relationship between academic engaged time and student achievement was established, research focus moved toward identifying and isolating teaching and classroom-related variables associated with higher rates of academic engaged time. The need for specific classroom guidelines led to attempts to identify demonstrably effective practices that schools and classroom teachers could use to maximise the time for instruction and learning.

4.4.1 Classroom practices linked to high levels of academic engaged time

The classroom practices discussed below have been linked to high levels of AET by many researchers (Berliner, 1980; Caldwell, Huitt, & Graeber, 1982; Fisher et al., 1980; Rosenshine, 1979; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986; Stallings, 1980; Strother, 1984; Tobin, 1984; Wang, 1980; Wyne, 1981; Wyne & Stuck, 1982) and have been consistently associated with achievement gains in academic subjects. These classroom practices are as follows:

1. More highly structured, teacher-directed instruction consistently appeared as a factor in classrooms where there were high levels of AET (Askew, 1993; Bender & Mathes, 1995; Christenson et al., 1987; Dunlap, Gleason, & Waugh, 1982; Frudden & Healy, 1986; Gettinger, 1986; Hudson, 1997; Mathes & Fuchs, 1994). The use of whole class demonstrations, simple sequential directions, clear modelling of tasks, and specific and relevant feedback were found to be critical. Seating arrangements which ensured visual contact by the teacher with students at all times were associated with increased academic engaged time in that it was easier to attract and maintain attention in these positions. Students in informal and self-directed settings spent less time in academic activities (Bennet, 1976; Gump, 1974; Soar, 1973; Stallings & Kaskowitz, 1974). Independent seatwork, particularly for low achieving students, was not conducive to high levels of AET because they found it much easier to move off task when not under the direction of the teacher.

2. The use of an interactive instructional style by the teacher increased academic engaged time (Allinder, 1994; Cannon et al., 1992; Christenson et al., 1987; Dunlap et al., 1982; Krupski, 1981; McDonnell et al., 1996; Pemberton, 1984; Potter, 1983; Wheldall & Carter, 1996; Yehle & Wambold, 1998). Requiring active responding from

students during a presentation and providing opportunities for students to ask questions and seek clarification increased student accountability and time on task.

3. Maintaining an academic focus was found to limit student disruption of others and so contributed to on-task behaviour (Dunlap et al., 1982; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986; Yates, 1988).

4. Close monitoring and supervision by the teacher during seatwork decreased the need to manage disciplinary problems which led to loss of learning time (Bradley, Bjorlykke, Mann, Homon, & Lindsay, 1993; Carmichael et al., 1997; Crocker, 1986; Gettinger, 1986). Movement around the room in a monitoring capacity rather than sitting at the teacher's desk engaging in non-interactive activities such as grading papers and planning future lessons led to greater AET. The movement of the teacher to the students requiring assistance, rather than vice versa, also led to increased learning time.

5. Maintaining the momentum of a lesson, avoiding either dwelling too long on, or moving too quickly through, material assisted academically engaged behaviour (Dunlap et al., 1982; Kounin, 1977; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986).

6. The organisation and consistent use of specific routines for regular classroom activities was associated with increased time on task (Bender & Mathes, 1995; Dunlap et al., 1982; Englert, 1984a; Fuller, Miller, & Lesh, 1989; Gettinger, 1986; McDonnell et al., 1996; Palmer & Neal, 1994; Pisarchick, 1989; Purvis et al., 1992; Tobin, 1984; Wheldall & Carter, 1996; Yehle & Wambold, 1998). Using students to distribute and collect material and having specific transition tasks or routines reduced transition time and eliminated inactive waiting time.

7. Matching instructional tasks with the ability levels of the students reduced time spent waiting for assistance or the use of off-task behaviour as an avoidance strategy. Organised and structured tasks, including clear indicators of what was expected from the students, enabled them to stay on task for longer periods (Christenson et al., 1987; Crocker, 1986; Dunlap et al., 1982; Ellis, Worthington, & Larkin, 1994; Haig, 1987; Hudson, 1997; Reid, Maag, & Vasa, 1993; Scruggs & Mastropieri, 1992).

8. Providing immediate corrective feedback on both behaviour and academic work assisted the maintenance of AET (Christenson et al., 1987; Gettinger, 1986; Maggs & Morgan, 1986; Thurlow, Ysseldyke, & Wotruba, 1988b).

Cannon, Idol & West (1992) validated these practices for teaching students with learning difficulties with 105 regular and special educators. Although Cannon et al identified 96 practices, broadly grouped into six categories (assessment and diagnosis; instructional content; instructional practices; managing student behaviour; managing the teaching and learning environment; and monitoring and evaluation procedures), each of the practices could be allocated to one of the eight categories listed above. As noted in Chapter Three, students with ADHD share many characteristics of students with learning disabilities. Thus, it could be reasonably assumed that these findings are relevant to students with ADHD.

If these practices are closely linked with high levels of academic engaged time it is logical to assume that if teachers of students with ADHD used these strategies the AET of the students would increase. Loss of engaged time in classrooms is one of the major difficulties experienced by students with ADHD. It is one of the purposes of this thesis to ascertain just what instructional strategies are used by teachers of students with ADHD, and how effective they are in maintaining the on-task behaviour and engagement of their students.

4.5 THE LINK BETWEEN CLASSROOM PRACTICES AND ACADEMIC ACHIEVEMENT

If there is a strong link between AET and academic achievement one would expect similar classroom practices to be associated with both. One test of this premise is to review the literature relating to those practices which have been linked with academic learning and determine the extent to which they match the practices discussed in the previous section.

Evidence on effective teaching of basic skills comes from different sources. Most evidence is the result of classroom-based observation studies (DuPaul & Henningson, 1993). Another source of information emerges from a refinement of "best practice" from acknowledged experts in the field (Cannon et al., 1992) using a Delphi procedure (repeated surveys of the experts until broad consensus is reached).

For the most part the effective teaching literature has been concerned with basic academic achievement in literacy and numeracy, as has the AET research. One notable exception to this was a year-long classroom study (Crocker, 1986) involving 75 second and fifth grade teachers, each of whom was observed for 30 hours. In-depth interviews and questionnaires were also used. Outcome measures in this study included reading and mathematics achievement but also addressed self-concept and classroom social status, and classroom behaviour ratings. What is of particular note is that Crocker's findings on her greater range of outcomes were highly consistent with findings from the effective teaching literature that examined more limited outcomes.

As would be expected, there was energetic debate throughout the period of intensive effective teaching research concerning the definition of *effective teaching*. Clearly, effective teaching constitutes far more than facilitating academic gains and effective teachers do far more for their students than bring about academic improvements.

Nevertheless, the academic achievement of students is a critical part of effective teaching, it can be measured in a relatively straightforward manner, and is therefore one useful measure of the effectiveness of teaching.

This period of research endeavour resulted in a strong and consistent body of literature linking certain classroom practices with academic gains. This connection existed despite the reporting of differing effect sizes and varying levels of correlational support for particular practices and criticism of different methodologies.

The literature is largely the result of research conducted in regular classrooms as opposed to special education classrooms. A number of researchers have, however, extended effective teaching research into classrooms containing students with mild levels of disability where they have found broadly confirming results. Notable amongst these are Allinder (1994), Englert (1984a) and Benner (1987). It would be fair to say that there is broad consensus on the findings of the effective teaching literature. This literature will now be reviewed.

4.5.1 Classroom practices linked to academic achievement

The following is a combination of the findings of original research and literature reviews regarding the conditions which are present most often when effective teaching (defined for the purposes of this thesis as leading to academic outcomes) is taking place:

1. Students have been found to learn more when actively engaged in an instructional task: when they are engaged in an academic activity, rather than listening to, or observing, such an activity (Christenson et al., 1987; Crocker, 1986; Dunlap et al., 1982; Ellis et al., 1994; Englert, 1984b; Fisher, 1980; Haig, 1987; Krupski, 1981; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986; Yates, 1988). The link between AET and learning is made quite explicit. One of the most powerful predictors of learning is a high level of AET.

2. Academic achievement is more likely to occur when classroom instruction is teacher-directed rather than student-directed (Brophy & Good, 1986; Crocker, 1986; Dunlap et al., 1982; Ellis et al., 1994; Evertson et al., 1980; Fitzpatrick & McGreal, 1983; Frudden & Healy, 1986; Frudden & Manatt, 1986; Rosenshine & Berliner, 1978 ; Rosenshine & Stevens, 1986; Yates, 1988). This does not necessarily mean that the classroom is not student-centred, but rather that it is the teacher who directs most learning activity in response to identified student needs. Academic achievement is maximised by a high degree of teacher control of tasks, time and movement: when instruction is directed and organised by the teacher (Bradley et al., 1993; Ellis et al., 1994; Englert, 1984a; Frudden & Healy, 1986; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986; Valett, 1989; Yates, 1988). Effective teachers provide carefully scaffolded and explicit instruction as described below. Lesson structure is important. Presentation is usually in small steps. Burton (1985 as cited in Westwood, 1993) indicated that students benefit from well structured lessons with a predictable format. A typical direct and organised format would be as follows:

- establish attention ;
- review past work;
- state the goals of the lesson clearly to the students;
- demonstrate the new material using small, sequential steps and many examples;
- ask a large number of simple questions which focus on the core content;
- provide cues where necessary to assist all students to respond;
- check frequently for student understanding;
- provide further guided practice and monitor performance closely;
- provide opportunity for guided practice with cues and prompts offered until students are confident and accurate;
- provide opportunity for independent practice for speed and automaticity when performance is proficient;
- consolidate and review lesson content before closing; and

- engage in cumulative review and provide regular revision and application throughout the following weeks.

Linking the current lesson to previously learned material was also found to be important when setting up the lesson. This required more than "remember what we were doing yesterday?" A more explicit review of major concepts was required.

As Westwood expresses it (1993):

> Effective teachers are more likely to say to the class, "Watch carefully, and listen to what I say to myself as I do this", rather than saying "See if you can work out how to do this for yourself" – often an invitation to failure for the lower ability students. They then provide carefully guided practice and corrective feedback to the students as they acquire the skill. This explicit teaching of task-approach strategies actually helps the students to become better "self-regulated learners", able to monitor their own performance and self-correct when necessary. (p. 24)

3. Greater academic achievement has been found to occur when instruction takes place in groups with students working on common tasks and with a high level of teacher interaction (Crocker, 1986; Fisher et al., 1980; Fitzpatrick & McGreal, 1983; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986; Valett, 1989). Effective teachers are able to quickly gain the attention of the whole class and engage them throughout a demonstration or explanation through the use of such techniques as direct questioning and group responding.

4. When a classroom is academically focused more student learning takes place (Brookover & Lezotte, 1979; Crocker, 1986; Dunlap et al., 1982; Ellis et al., 1994; Fitzpatrick & McGreal, 1983; Rosenshine & Berliner, 1978; Rosenshine & Stevens,

1986; Yates, 1988). This involves a tightly coupled curriculum: one in which goals, curriculum and evaluation devices are closely related.

5. Student achievement is maximised where students have many opportunities for interaction and response in classrooms (Crocker, 1986; Frudden & Healy, 1986; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986; Valett, 1989; Yates, 1988). Thus, the effective teacher-directed classroom is not one in which the teacher does all the talking, but rather provides opportunities for students to interact and respond within demonstrations, explanations and so on.

6. Students' gains were found to be higher when there was careful monitoring of instruction, seatwork and student engagement (Bradley et al., 1993; Christenson et al., 1987; Crocker, 1986; Dunlap et al., 1982; Fitzpatrick & McGreal, 1983 ; Frudden & Healy, 1986; Potter, 1983). Students need supportive interaction with teachers to make most progress. Seatwork should only be assigned when students have a high degree of success with the task and are able to work largely independently (Christenson et al., 1987; Dunlap et al., 1982; Englert, 1984c; Fitzpatrick & McGreal, 1983; Frudden & Manatt, 1986; Potter, 1983; Rosenshine & Stevens, 1986; Thornton et al, 1983).

7. A brisk pace and maintenance of momentum (Brophy, 1979; Englert, 1984a; Frudden & Healy, 1986; Westwood, 1993) have been found to be present in those classrooms where higher academic gains were made. This helps prevent student boredom, assists in keeping students on task, and so increases work output.

8. More learning was found to take place in classrooms where teachers were good classroom managers (Crocker, 1986; Englert, 1984a; Fitzpatrick & McGreal, 1983; Fuller et al., 1989; Yates, 1988). In the setting-up phase, teachers who communicated lesson rules and expectations regarding desired behaviours, particularly those that facilitated attention to task, had more successful students (Anderson, Evertson, & Brophy, 1979; Brophy & Good, 1986; Emmer & Evertson, 1980; Brophy, 1979;

Emmer & Evertson, 1981; Evertson et al., 1980). Good classroom managers establish, in collaboration with their students, strong rules and routines for dealing with such things as requests for help; they monitor rules closely and follow through with consequences; they minimise constraints and interruptions; and they maintain efficient transitions. The classroom is physically arranged so students can move without disturbing others when handing in work and organising materials.

9. Academic gains were made more often when there was a close match between student ability and task demand. This ensured relevance and high success rate, particularly when students were engaged in seatwork (Christenson et al., 1987; Crocker, 1986; Ellis et al., 1994; Englert, 1984c; Frudden & Healy, 1986; Fuller et al., 1989; Haig, 1987; Thornton, 1983; Westwood, 1993; Wheldall & Carter, 1996).

10. Academic success was related to frequent teacher feedback (Crocker, 1986; Englert, 1984a; Frudden & Healy, 1986; Fuller et al., 1989; Thornton, 1983; Valett, 1989; Westwood, 1993). This provides the necessary direction and prevents students practising incorrect procedures, in addition to providing reinforcement for correct work.

4.5.2 Summary of practices linked to academic achievement

The match between the practices associated with academic engaged time and those associated with academic achievement is close which supports the view that a strong link exists between these two factors. With such a strong and consistent body of research to support the practices discussed thus far, it is perhaps surprising that these practices are not universally known and practised. Several authors have pointed out that a discrepancy exists between common teaching practice and that which has the strong support of research (Crocker, 1986; Hempenstall, 1996; Hillage et al., 1998; Westwood, 1993). Policy-makers and teachers appear to be insufficiently informed by research findings, either because they are presented in a form that is inaccessible to a

non-academic audience, they lack interpretation for policy-makers or practitioners, are not easily generalisable, or do little to advance real understanding of the issues. Teachers are overwhelmingly more likely to use information gained from other teachers or workshops than from academic journals (Landrum, Tankersley, & Cook, 1998). Thus, much of the research cited above has not permeated into classrooms. Student freedom of movement, student task choice and a greater openness in the classroom is still often perceived as more desirable than a teacher-directed classroom (Hempenstall, 1996; Westwood, 1993).

An open classroom in which great student freedom of movement and task choice is the norm could lead to increased difficulties for students who find it difficult to focus and attend to task as is the case with students diagnosed with ADHD. It would appear that a mismatch between the needs of students with ADHD and common classroom practice is one reason why these students struggle in many classrooms. Examining the literature related to recommended practices for students with ADHD will help establish whether or not there is a match between those practices normally recommended for increased AET and academic gains and those recommended for students with ADHD.

4.6 RECOMMENDED TEACHING PRACTICES FOR STUDENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

While much of the literature relating to effective teaching of regular students has resulted from classroom-based studies, information regarding best practice for teaching students with ADHD has been derived largely from research conducted in the fields of psychology and medicine in laboratories or clinical settings rather than in school settings. This is perhaps why many of the findings have remained inaccessible or unknown to most classroom practitioners. Fiore, Becker and Nero (1993) did a large scale review of studies relevant to the education of students with ADHD with a particular emphasis on non-pharmacological approaches. They found only 21 of the 137 studies reported findings in actual classroom settings. They concluded that

> Overall the literature on educationally relevant interventions for children and youth with ADD is exploratory, not prescriptive. (p. 170)

Some writers have extrapolated information from regular effective teaching research and put forward suggestions that they believe would be most relevant for the ADHD population. A great deal of this information is presented in the manner of "promising strategies" (Burcham & Carlson, 1994; Burcham, Carlson, & Milich, 1993; Fiore & Becker, 1994), or as "tips for teachers" rather than as the result of classroom-based research. Nevertheless, there is considerable consistency in the nature of the advice given.

Those practices emanating from the laboratory-based research and the effective-teaching literature which have been widely recommended for the effective management and instruction of students with ADHD in regular classrooms will now be discussed. [The use of stimulant medication (Bailey & Rice, 1997; Barkley, 1992; Carpenter, 1995; Forness et al., 1997; Wolfe & French, 1990) has been recommended as one part of an effective response to the condition by many different researchers, although its use is still viewed negatively by some workers in the field (Fiore & Becker, 1994). As this response to the condition is outside the classroom teacher's area of responsibility, it is not included in the following list of recommended practices. Other practices such as reduction in class size, gaining specific information about the condition, parent education programs and close communication between home and school were recommended, but were not included in the recommended practices here as they were not considered to be strictly classroom-based interventions.]

1. The provision of a highly structured and predictable setting is strongly recommended. Askew (1993) found that 67% of 183 special education teachers who responded to a survey included this in their list of preferred strategies for students with

ADHD. This recommendation also featured regularly in other literature (Bailey & Rice, 1997; Barkley, 1990; Barkley, 1992; Bender & Mathes, 1995; Bender & McLaughlin, 1995; Forness et al., 1997; Goldstein, 1995; Hudson, 1997; Jarman, 1996; Kameenui & Simmons, 1990; Prior & Sanson, 1986; Purvis et al., 1992; Schwean et al., 1993; Scruggs & Mastropieri, 1992; Wolfe & French, 1990; Yehle & Wambold, 1998). Specific strategies such as using an outline for lessons, repeating and highlighting key concepts, establishing and posting clear and consistent rules and consequences, foreshadowing transition times, reviewing rules frequently throughout the year, providing clear and focused instruction, setting time limits, and providing a consistent routine would be included within this recommendation. To quote just two advocates of this principle:

> ADHD children respond best to a highly organised and routine classroom structure, with a minimum of visual distraction and noise (Jarman, 1996 p. 51), and
>
> Their (children with ADHD) problems are worsened if they are in large unstructured learning settings; and they are advantaged where they are in highly regulated, predictable, and strictly managed classrooms with a directive teacher who applies consistent discipline. (Prior, 1996, p. 25)

2. It is recommended that teachers use strategies that maximise attention before giving directions or issuing instructions. Using names frequently and giving short, one-step directions that do not tax attention capabilities were suggested in the literature. Surrounding the student with on-task peers so that he or she was less likely to be distracted by peer behaviour, is also strongly suggested (Barkley, 1990; Barkley, 1992; Bender & McLaughlin, 1995; Division of Innovation and Development, 1994; Goldstein, 1995; Purvis et al., 1992; Schwean et al., 1993; Yehle & Wambold, 1998; Zentall, 1980; Zentall, 1985; Zentall, 1989; Zentall, 1993; Zentall & Shaw, 1980). The addition of novelty to easy and repetitive tasks is seen to facilitate attention although

new or difficult tasks often require a more directed and structured approach. Students also need to be trained to recognise "time to begin" cues to increase attention.

3. The reduction of extraneous stimulation in the surrounding environment is seen to be of benefit to students diagnosed with ADHD (Abramowitz & O'Leary, 1991; Abramowitz, O'Leary, & Futtersak, 1988; Abramowitz, O'Leary, & Rosen, 1987; Askew, 1993; Bailey & Rice, 1997; Barkley, 1990; Barkley, 1992; Bender & Mathes, 1995; Carmichael et al., 1997; Division of Innovation and Development, 1994; Fiore & Becker, 1994; Purvis et al., 1992; Umbreit, 1995; Yehle & Wambold, 1998). Seating the student away from high traffic areas and areas of obvious distraction such as doors and windows was a suggested way of limiting distractions. Teaching students to use a blank sheet of paper to cover sections of page not being used, to use study carrels if available and to reduce unnecessary clutter were additional suggested strategies. Dividing assignment work into smaller sections so the student could direct attention more easily to the immediately relevant parts of the assignment is also recommended.

4. The use of behavioural interventions, incentives and rewards, such as token economies for work completion and attention to task is widely recommended in the related literature (Abramowitz & O'Leary, 1991; Abramowitz et al., 1988; Abramowitz et al., 1987; Bailey & Rice, 1997; Barkley, 1990; Barkley, 1992; Bender & Mathes, 1995; Bender & McLaughlin, 1995; Division of Innovation and Development, 1994; Fiore & Becker, 1994 ; Goldstein, 1995; Hudson, 1997; Purvis et al., 1992; Schwean et al., 1993; Wolfe & French, 1990; Yehle & Wambold, 1998). Stronger than usual reinforcers are typically required (DuPaul & Stoner, 1994), but programs of this nature have been found to be effective. Cognitive behavioural interventions have been less successful (Fiore & Becker, 1994; Green & Chee, 1994) although they have the advantage of being easier to generalise and maintain.

5. The incorporation of tasks that require active responding and the provision of opportunities for productive legitimate movement are suggested as useful in assisting students with ADHD to remain on task (Barkley, 1990; Barkley, 1992; Carmichael et al., 1997; DuPaul & Henningson, 1993; Fiore & Becker, 1994; Goldstein, 1995; Schwean et al., 1993; Scruggs & Mastropieri, 1992; Yehle & Wambold, 1998). Students with ADHD may need to move more often than their peers. Arranging this as part of the class routine allows their movement to be less disruptive.

6. The increased use of demonstrations and visual cues is recommended to increase attention and add motivation (Barkley, 1990; Barkley, 1992; Division of Innovation and Development, 1994; Goldstein, 1995; Purvis et al., 1992; Schwean et al, 1993; Scruggs & Mastropieri, 1992; Yehle & Wambold, 1998).

7. The teaching of self-monitoring strategies is recommended by a number of writers and practitioners in the field. Programs which use timers or buzzers as cues to monitor attention have had some success with students who were motivated to increase their attention to task (Askew, 1993; Bailey & Rice, 1997; Barkley, 1992; Bender & Mathes, 1995; Fiore & Becker, 1994; Fiore et al., 1993; Forness et al., 1997; Scruggs & Mastropieri, 1992).

8. It is recommended that teachers assist with organisational strategies (Bailey & Rice, 1997; Barkley, 1990; Barkley, 1992; Bender & Mathes, 1995; Scruggs & Mastropieri, 1992; Yehle & Wambold, 1998). Suggested practices included designating the student's space, particularly when engaging in large group activities; modelling organisational skills; providing different coloured notebooks for different subjects; keeping essential information in one place; numbering pages of handouts; using large simple fonts on worksheets; and highlighting critical information.

9. An emphasis on formative rather than summative evaluation procedures is recommended in the literature. Providing feedback often and at regular intervals is seen to be very important in keeping students with ADHD on task (Barkley, 1990; Barkley, 1992; Forness et al., 1997; Goldstein, 1995; Schwean, 1993; Yehle & Wambold, 1998).

10. It is recommended that teachers address academic deficits directly and specifically teach such skills as strategy training, mnemonic strategies, organisational cues, outlining skills, and problem solving skills (Carmichael et al., 1997; Fiore & Becker, 1994; Forness et al., 1997; Goldstein, 1995; Schwean et al., 1993; Scruggs & Mastropieri, 1992; Yehle & Wambold, 1998).

11. The use of computers is widely recommended (Askew, 1993; Forness et al., 1997; Yehle & Wambold, 1998) as computers are continually responsive and can provide endless opportunities for both guided and independent practice of basic skills.

12. Higher levels of monitoring than usual are recommended because of the predisposition to move off task which is part of the ADHD condition (Bender & Mathes, 1995; Goldstein, 1995; Purvis et al., 1992; Schwean et al., 1993; Scruggs & Mastropieri, 1992; Yehle & Wambold, 1998).

13. The use of calm, firm, consistent and immediate directions and reprimands is widely recommended (Abramowitz et al., 1988; Abramowitz et al., 1987; Barkley, 1990; Goldstein, 1995; Schwean et al., 1993).

14. A close match between curriculum tasks, the pace of instruction and the ability of the student is seen to be essential in keeping these students engaged in classroom tasks (Bailey & Rice, 1997; Barkley, 1990; Bender & Mathes, 1995; Fiore & Becker, 1994;

Goldstein, 1995; Schwean, 1993; Scruggs & Mastropieri, 1992; Yehle & Wambold, 1998).

15. Social skills training is also recommended as a classroom strategy because of the high comorbidity of social difficulties and ADHD (Carpenter, 1995; Carroll, 1993; Schwean et al., 1993).

Perceptual motor training and modality (learning styles) instruction have been recommended by a small number of writers, but these approaches are not consistent recommendations.

4.7 SUMMARY OF LITERATURE ON PRACTICES LINKED TO ACADEMIC ENGAGED TIME AND ACADEMIC GAINS AND PRACTICES RECOMMENDED FOR STUDENTS WITH ADHD

Table 4.1 shows a comparison of the classroom practices associated with AET, with higher academic gains, and those recommended for teachers of students with ADHD. There is clearly a close relationship between recommended practices for students with ADHD and those factors relating to increased AET and learning. This is to be expected in view of the fact that many practices have been extrapolated from the effective teaching research. Some additional considerations have been recommended for classrooms that contain students with ADHD, although most of these do not contradict the "spirit" of those recommended for increased academic engaged time and higher academic gains. Such strategies as maximising attention, teaching organisational and self monitoring skills, issuing calm and firm commands, using computers, addressing academic deficits directly and teaching social skills would not be out of place in any effective classroom.

Table 4.1

Summary Table Comparing Classroom Practices Linked to High Levels of Academic Engaged Time, High Academic Gains and Practices Recommended for Teachers of Students with ADHD

Classroom Practice	Linked to AET	Linked to academic gains	Recommended for ADHD
1. Highly structured, teacher-directed teaching	✓	✓	✓
2. Close monitoring and supervision during seatwork	✓	✓	✓
3. Maintenance of academic focus	✓	✓	✓
4. A brisk pace and maintenance of momentum	✓	✓	✓
5. Use of interactive teaching style	✓	✓	✓
6. Use of strong routines	✓	✓	✓
7. Match of instructional task with student ability	✓	✓	✓
8. Provision of immediate corrective feedback, including academic feedback	✓	✓	✓
9. Maximising attention before instructions	✓	✓	✓
10. Reduction of extraneous stimulation			✓
11. Addressing of academic deficits directly			✓
12. Use of behavioural interventions			✓
13. Inclusion of legitimate opportunities for movement			✓
14. Use of visual aids and cues			✓
15. Teaching of self monitoring strategies			✓
16 Assistance with organisational strategies			✓
17. Use of computers			✓
18. Social skills training			✓

It should be emphasised again that the practices recommended for the teachers of students with ADHD have undergone little "testing" in regular classrooms. It is a major purpose of this thesis to investigate those teaching practices which are associated with increased academic engaged time in primary school aged students diagnosed with ADHD. This thesis will enable some comparison to be made between those practices

recommended in the literature and those which emerge from the classroom-based data as being associated with high AET for this group of students. Information gained from this study can guide recommended practices for students with ADHD with more confidence, as it will have been grounded in data from their natural learning environment.

With some understanding of those organisational, management and instructional practices which are related to high AET, other elements within the ecology of the learning environment need to be examined. One of Doyle's (1986) classroom dimensions which has not yet been considered is that of the learning tasks within classrooms and their differing natures, demands and interest levels. This can be seen to relate to the *rate of success* element of academic learning time and highlights the significance of matching tasks to students if learning is to be maximised.

4.8 THE NATURE OF CLASSROOM TASKS AND THEIR RELATIONSHIP TO LEARNING

Having considered organisational, management and instructional practices which have been recommended for students with ADHD, another element of the classroom environment which has had comparatively little direct attention from educators is that of the learning tasks involved (Derevensky et al., 1983). Derevensky reported that critical differences in learning tasks were being overlooked and that there was a need to examine the appropriateness of the tasks being given to students, especially those with learning problems such as students with ADHD would have. Nearly a decade later, Abramowitz & O'Leary (1991) were still noting the dearth of attention this factor (among others) was receiving:

> Environmental and task characteristics have received far less attention from psychologists and educators than have consequences (contingency management) both in efforts to understand the factors

> that maintain inappropriate behaviour and in the development of interventions. (p. 221)

This comment is entirely consistent with Bronfenbrenner's view that all dimensions of an environment need to be considered when attempting to understand individual behaviour and development. The nature of the learning tasks is a critical factor within classrooms and requires close examination.

4.8.1 Task characteristics and their impact on engagement

Tasks may make greater or lesser demands on individuals. Clearly the nature of the task and specific task variables will have some impact on the level of engagement of students, particularly those with attention difficulties. Understanding the varied attention demands implicit in different tasks provides some insight into the nature of those tasks or activities which are able to attract and sustain the attention of students with ADHD.

Attention may be classified as either voluntary or involuntary. James (1890/1950, cited in Krupski, 1981) was among the first to make this differentiation. Unexpected, intense or voluminous stimuli elicit attention in an almost reflex-like manner. Stimuli with what Krupski (1981, p. 6) refers to as *"congenital appeal"*, such as blood, or novel or moving objects, have a similar impact. If teachers could guarantee that their lessons continually contained these sorts of stimuli, gaining the attention of all students would not present a problem. These would be considered to be low demand tasks in that involuntary responses are elicited directly by the physical properties of the stimuli. Other high interest stimuli are also less demanding of attention. Free play, in which children are given a variety of interesting toys from which to choose, is highly motivating for most children. Although not eliciting reflex-like responses, the toys may be considered to directly draw and hold the child's attention.

Other tasks, however, require attention which has a strong volitional component. The task alone does not capture the individual's attention. The individual must act in a deliberate, sustained and voluntary manner in order to engage. Tasks requiring voluntary attention for sustained periods call for monitoring and increased effort by individuals. These may be considered high demand tasks.

Krupski concluded after significant research using laboratory tasks that learning-disabled and normal students did not differ in reflex-like responses. All individuals respond to such stimuli in a similar manner. The two groups differed consistently, however, when the experimental tasks required children to respond to tasks with some intent or anticipation. Task performance was most often adversely affected when tasks tapped higher cognitive processes (Krupski, 1980; Krupski, 1981; Krupski & Boyle, 1978). Unfortunately, these studies employed experimental tasks rarely found in classrooms.

Other work by Krupski (1985) involved three different types of tasks that are commonplace in classrooms: high-demand tasks such as reading and mathematics; medium demand tasks such as copying from the blackboard; and low-demand tasks such as playing with clay, or drawing a picture of the child's choice. One of the specific groups she used in this investigation was of students with attention difficulties. Regular students spent similar amounts of time on tasks of all types. For students with attention difficulties, however, the degree of on-task behaviour was related directly to the task type. Those tasks requiring the least amount of voluntary attention resulted in the highest levels of on-task behaviour.

Thus, attention difficulties are most frequent when task demands reflect high degrees of voluntary attention. Krupski found that students with learning difficulties spent significantly less time on task than normal peers when working on academic tasks but

were comparable in time on-task measures when engaged in art activities (Krupski, 1979).

Any investigation of student on-task behaviour should incorporate analysis of the tasks involved. High levels of on-task time are less significant if they occur with low-, rather than high-demand activities. What is of greatest interest when considering academic achievement is those strategies that promote high AET on the more challenging tasks, those that tap higher cognitive processes. This thesis will address these issues in order to identify those strategies most predictive of high levels of AET on high-demand tasks. This should also address the concerns of some critics (for example Christenson et al., 1987) who believe that measures of AET are not useful because "busywork" can contribute to high levels of AET but not really contribute to worthwhile learning. Analysing the task in addition to the AET will reveal those periods when higher cognitive demands are being made.

Further considerations relating to the task element of the classroom ecology concern how well tasks are matched to the ability and interest level of the individual students. Tasks which are below the ability level of students may fail to engage them just as tasks which are beyond their ability level may have a similar effect. Selecting appropriate tasks for students is a major responsibility of teachers in order to maximise engagement. This thesis will consider student-task match when analysing the classroom ecology in order to determine the impact this factor may have on student engagement.

Other aspects of the classroom ecology are also of significance. Bronfenbrenner (1979) developed hypotheses concerning the relationships which existed among the people who coexist in particular environments. His notion of the importance of *developmental dyads* in promoting individual development leads to an examination of the affective

component of the classroom, and relationships that may exist between the emotional climate of a classroom and learning.

4.9 THE SIGNIFICANCE OF THE EMOTIONAL CLIMATE OF THE CLASSROOM

A point of some debate in the literature concerns the extent to which the emotional climate of a classroom and the personal warmth of the teacher contribute to the effectiveness of the learning environment. A number of authors support the notion that an effective teacher establishes a warm and supportive classroom (Crocker, 1986; Dunlap et al., 1982; Fuller et al., 1989; Ginnot, 1971; Ginnot, 1973; Glasser, 1993; Goldstein, 1995; Jones, 1987a; Jones, 1987b; Pemberton, 1984; Ruddell, 1995; Scruggs & Mastropieri, 1992; Valett, 1989). It should be noted, however, that affective measures do not feature nearly as frequently in the effective teaching literature as those elements relating to organisational and instructional factors. Nor do positive personal interactions between students and teacher feature significantly in the recommendations for teaching students with ADHD, although there is some mention made of this factor (Goldstein, 1995). Overall, there was again far greater emphasis on organisational, management and instructional factors.

Soar and Soar (1979) actively dispute the fact that a warm emotional climate in which the teacher is outgoing and supportive, uses praise effusively and attunes to the emotional needs of students is a necessary element of an effective classroom. They found that classes which were affectively neutral were just as good in terms of student achievement. What was to be avoided, according to these authors, was the harsh, negatively affective environment.

Pemberton (1984), a critic of much of the effective teaching research, contends that good instruction certainly includes, but should extend well beyond, the use of

management techniques and provision of learning opportunities: it should also *"...reflect awareness of the interactive nature of the teaching situation."* (p. 6)

This lack of concordance in the literature required further investigation. Attempts to pursue this investigation led to a search of the literature in other domains in an effort to understand the role of the affective environment in a classroom. The psychological literature provided one avenue of potentially useful research.

Wool (1989) suggests that the developmental theories of psychotherapy could contribute to an understanding of both the successful and unsuccessful patterns of learning in educational settings. She believes such theories could contribute a balancing perspective to the already well-established educational emphasis on cognitive models and subject mastery in the teaching/learning process.

Wool quotes Lustman, who states that learning occurs *"within the context of intense relationships"* (p. 733). Lustman argued that the critical question, *"How do we make maximal use of the teacher as a crucial object in the lives of children?"* could best be answered through collaboration between education and psychotherapy. He spoke of the *"clinical dimension in education"* and argued that what has changed most in the past 25 years is less to do with subject matter and teaching methodology and more to do with the human variables in the educational situation (p. 274).

Wool (1989) states that an understanding of psychotherapy has particular relevance for the problems presented by what she referred to as *"the unprecedented numbers of impulse-ridden, developmentally impaired children"* (p. 734) who are appearing in primary-school classrooms:

> An understanding of the human variables in education, the dynamic interactions of teachers and learners, in particular, is the missing dimension in educational discourse and practice. (p. 735)

Clarkson (1995) claims that

> The interconnectedness between two people features in any major changes in people's lives, whether this happens as a result of falling in love, being in a crisis, *educational development*, (italics added) religious conversion or effective therapy. (p. viii)

Basch (1989) agrees that

> like it or not, the teacher, if he or she is to be successful, must function as a psychotherapist, not in the formal sense of conducting therapy sessions with students, but in the practical sense of being alert and responsive to the psychological needs that students evince both by what they do and what they do not do. (p. 772)

He refers to the role teachers have played in the lives of great and successful people:

> I cannot think of any successful person who, when giving biographical information, has not credited a teacher's influence for contributing significantly to his or her accomplishments. What is singled out is not usually the knowledge that that teacher imparted, but rather the impact of his or her personality that permanently altered the student's outlook... What makes the difference is that as a result of their relationship the student's view of himself (sic) is permanently altered. (p.773-4)

These writers see a close link between the teacher-student relationship and learning. This view led to a further search for any particular models within psychological theory which may help explain the dynamic interactions that occur between an effective teacher and his or her students.

In the psychological literature relating to the interaction between counsellors and their clients (in Bronfenbrenner's terms, these would be considered *developmental dyads*), there has been extensive exploration of the concept of *therapeutic alliance*. Whilst the setting is different from that of a classroom, parallels might be drawn between the

interpersonal connection or therapeutic alliance between therapist and client and the bond between a teacher and student.

4.9.1 The concept of 'alliance'

The term *alliance*, when used in the psychological and psychotherapeutic literature, refers to more than a feeling of mutual warmth and rapport, although that notion is certainly part of it. According to Bordin's (1979) explanation, the concept of alliance can be broken into three components: *bonds, goals* and *tasks.*

The *bond* concerns the interpersonal approach of the counsellor. It is the genuine demonstration of an empathic understanding of the client's concerns and unconditional acceptance of the client as a person. This is seen to be a prerequisite for the psychological growth of the client. The counselling bond can be enhanced when the "fit" between the interpersonal styles of counsellor and client is good and threatened when such a fit is poor. The counsellor's task is to modify his or her own style to complement the client's style. Some clients prefer a more formal approach from the counsellor. In these cases, there is little point in persisting with an informal and friendly style. It would be more beneficial to emphasise one's credibility as an expert. Conversely, those clients who respond to friendly and informal approaches need to see this in their counsellor if alliance is to develop.

The second component - *goals* - pertains to the objectives shared by the client and counsellor. A positive therapeutic outcome is facilitated when the counsellor and the client agree on the perceived therapy goals, and agree to work towards the fulfilment of these goals. In order for these to be clear, they should be made explicit. Specifying goals makes them achievable and subject to evaluation. Goals must also be within the client's power, and not related to change in another person.

The third component pertains to the *tasks* or activities carried out by both counsellor and client in pursuit of the goal(s). Clients must understand what their tasks are, see the value of doing them, have the ability to carry them out, and have the confidence to execute them.

It is relatively easy to transfer these notions to an effective classroom. In such a classroom, the teacher would respond positively and unconditionally to the student in a manner which the student finds congruent with his or her own personal style, the teacher and student would agree on the learning goals, and the student would both understand how those goals were to be achieved and have confidence in his or her ability to achieve them. In this way teacher and student would come together in a shared alliance.

The notion of alliance also intersects well with Bronfenbrenner's notion of how a developmental dyad operates. To requote Bronfenbrenner's (1979) seventh Hypothesis:

> Hypothesis 7
> Learning and development are facilitated by the participation of the developing person in progressively more complex patterns of reciprocal activity with someone with whom that person has developed a strong and enduring emotional attachment and when the balance of power gradually shifts in favour of the developing person. (p. 60)

Clearly an effective teacher would be operating within a developmental dyad with each student. If this is so, the affective realm of the classroom is clearly of significance, because *"a strong and enduring attachment"* is prerequisite to such a dyad. Duffy (1998), operating from outside the psychotherapy realm, also claims that teaching excellence clearly involves more than the skillful use of pedagogy. Some teachers are far more effective than others who use the same strategies and have had the same

training. Interestingly, he refers to a *"sense of alignment"* (p. 780) as the critical feature that exists between the most effective teachers and their students.

Could this be an explanation of that factor which exists in the very best of classrooms, that appears to bind together the teacher and the students in a environment which is conducive not only to effective learning, but also to a real nurturing of each unique individual within that environment? This thesis will investigate the affective nature of classrooms in which students with ADHD operate in order to explore this issue.

4.10 CHAPTER SUMMARY

The individual behaviour of students with ADHD, the organisational, managerial and instructional practices of the teachers and the nature of the learning tasks, are all critical components of the ecology of a classroom. There is also some debate about the extent to which the affective or emotional climate of the classroom contributes to positive educational outcomes for students. This thesis will investigate each of these in relation to students with a diagnosis of ADHD when analysing the ecology of their classrooms. Chapter Five will explain the research methodology used to conduct this investigation.

CHAPTER FIVE

SELECTION OF THE RESEARCH PARADIGM, DATA COLLECTION AND DATA RECORDING PROCEDURES

The purpose of this study was to investigate the interactions between students diagnosed with ADHD and their classroom ecologies with a view to developing a model of best practice for students with this diagnosis. This has been done within the framework of Bronfenbrenner's (1979) ecological model of individual development. In this chapter the selection of a qualitative research paradigm and a multiple-case study design are justified, and the specific techniques and procedures which have been used in the conduct of the research are explained.

5.1 SELECTION OF THE RESEARCH PARADIGM

This research was located within a qualitative or naturalistic paradigm. One of the major criticisms of the research concerning ADHD is that it has taken place in laboratories or clinical settings (Fiore et al., 1993). Therefore, an investigation of students with ADHD in their natural learning environments – their classrooms – appeared most suitable.

Qualitative research employs *"the natural setting as the direct source of data and the researcher is the key instrument."* (Bogdan & Biklen, 1992, p. 29). It operates on the principle that *"action can best be understood when it is observed in the setting in which it occurs* "(Bogdan & Biklen, 1992, p. 30). A methodological approach which acknowledges, indeed demands, input from contextual factors when attempting to understand a particular phenomenon was seen to be particularly appropriate for an investigation conceptually grounded in Urie Bronfenbrenner's (1979, 1989) ecological approach to individual development. He views classrooms as systems that exists within the broader contexts of a school, a community, a set of cultural values and

beliefs, an economic environment, and so forth. The qualitative methodological orientation utilised in this investigation is thus very much aligned with Bronfenbrenner's views on the importance of considering behaviour and development within the context of both immediate and extended environments.

Bronfenbrenner himself was critical of the emphasis on scientific, laboratory-based research on the behaviour of children which led to experiments that were *"elegantly designed but often limited in scope"* (1979, p.18). Consideration of the various elements within the classroom environment and of the impact that different elements have on each other is necessary if clear understandings of the behaviour of students with ADHD are to be gained. Walker and Evers (1988) expressed the preference for qualitative research in education thus:

> ...the genuinely and distinctively human dimension of education cannot be captured by statistical generalisations and causal laws. Knowledge of human affairs is irreducibly subjective. It must grasp the meanings of actions, the uniqueness of events, and the individuality of persons. (pp. 29-30)

A further argument for adopting a naturalistic over experimental method in the study of human behaviour was *"the practical and ethical impossibility of manipulating and controlling variables of primary significance"* (Bronfenbrenner, 1979, p. 19) when examining the causes of behaviour. Working in classrooms in schools, with children and teachers whose daily lives had an impact on the results meant that control of variables was impossible, even if it were desirable.

As Bronfenbrenner (1979) also points out, it is not only consideration of the environment, but the interaction of the varying elements and the environment, that is of significance. The whole is considered more than the sum of the parts:

> The developing person is viewed not merely as a tabula rasa on which the environment makes its impact, but as a growing, dynamic entity that progressively moves into and restructures the milieu in which it resides. The environment also exerts its influence, requiring a process of mutual accommodation. (pp. 21-22)

Robinson (Robinson, 1980, p. 187) supports the notion thus:

> Any attempt to understand the "whole" by breaking it down into component "parts" will always miss the nature of the relationship between the "parts" and quality of their interaction. (p. 187)

Thus, a qualitative approach which acknowledges that human behaviour is significantly influenced by the setting in which it occurs and the relationships between various elements of that setting was the chosen approach for this investigation.

5.1.1 The processes of analytic induction and theoretical sampling

Two processes which are critical to an understanding of the data collection procedures used in this study are *analytic induction* and *theoretical sampling*. These procedures were used in order to develop a model of effective teaching which was grounded in data collected in the natural learning environment of the target students.

In qualitative research an investigation begins with a broad interest in a particular phenomenon and data are collected with the intention of exploring a range of ideas. This period of the research is referred to as the *"initial stage"* (Burns, 1994) of a qualitative study and gradually directs and informs the development of the precise research questions to be investigated. Early propositions about certain relationships may begin to emerge quite rapidly. *Analytic induction* (Strauss & Corbin, 1990) assists the development of firm propositions as it demands that each data collection period supports the proposition being developed. If this doesn't occur, then the

proposition must be reviewed. In this way, the research questions constantly evolve in response to insights which emerge as further analysis occurs.

This study began with an interest in the classroom behaviour and learning problems of students with ADHD. The research questions recorded in Chapter One evolved over a period of some months. Extended time in classrooms heightened awareness of the range of factors which appeared to have an impact on the classroom performance of students diagnosed with ADHD. The physical layout of the room, organisation of desks, and the nature and placement of student work and organisational material appeared to have an impact on student behaviour. Factors relating to the students themselves, such as medication effects and intensity of ADHD behaviours, appeared to be of importance. Classroom behaviour appeared to differ according to the learning tasks, the management style evident in the classroom, and the ways in which instruction was delivered. Strikingly different behaviours were exhibited by one student with different teachers. Questions relating to each of these broad areas were refined throughout the early months of the study before reaching the focus of the questions set out in Chapter One.

Theoretical sampling (Strauss & Corbin, 1990) assists the process of analytic induction by directing the sampling procedures in response to issues which emerge from the data. It is a recurring process and may facilitate the research process in a number of ways. It may, for example, develop existing categories. In this thesis, the various categories of teacher behaviours – organisation of the physical environment, management strategies, and instructional methodologies – emerged from preliminary analysis as data collection proceeded. Theoretical sampling may also test emerging propositions. For example, early observations led to the proposition that students with ADHD were highly visual in their orientation. In order to test this emerging proposition, particular attention was focused in subsequent observation periods on the extent to which visual aids were used in lessons and student responses throughout these lessons. Theoretical sampling may

also suggest new categories or lines of enquiry. In this thesis, the atypical behaviour demonstrated by one student, Eric, during the initial stage of the research led to further investigation in his classroom in order to follow up these unexpected findings. These are all examples of sampling which occurred in response to data already collected. Thus, theoretical sampling is an in-depth study of particular categories of phenomena, with progressive interpretations guiding the next period of observation. This constant feedback gave the study its forward momentum and progressive focus, with the research process being cyclical rather than linear.

5.2 RESEARCH DESIGN

This research used a multiple-case study mode of enquiry. Yin (1994) contends that a case study design has distinct advantages when *"a 'how' or 'why' question is being asked about contemporary set of events over which the investigator has little or no control"* (p. 9). Yin also states that

> you would use the case study method because you deliberately wanted to cover contextual conditions – believing that they might be highly pertinent to your phenomenon of study. (p. 13)

This approach, therefore, is most appropriate for an investigation theoretically framed in Bronfenbrenner's ecological model which purports that behaviour can only be understood in terms of its context and the interactions that take place within that context.

Multiple-case designs also have distinct advantages over single-case designs. They are not based on the sampling logic of multiple subjects within one experiment, but rather represent a type of *"multiple experiment"* (Burns, 1994, p. 369). Multiple-case studies may provide replication and so findings are regarded as being more robust (Yin, 1994). They may also reveal differences or nuances which add greater insight to the phenomenon being studied. In this study, looking at different students diagnosed with ADHD, of differing ages, in different classrooms, provided a cross-sectional snapshot

of how a range of students with ADHD interacted within their classrooms. Findings which emerged consistently from all classrooms would be therefore more compelling than findings which emerged from a single case study. A need to examine more carefully or revise some propositions may also be the result of conflicting findings. In either case, a clearer understanding of how students with ADHD function in the classrooms would emerge than if only a single case study were undertaken.

Case studies draw on multiple sources of information. These are seen to be complementary, with no single source having a distinct advantage over any other (Creswell, 1998; Yin, 1994). Each source of evidence should be used to corroborate information from other sources. If a source of evidence is contradictory, further inquiry is clearly necessary.

The specific data collection techniques incorporated within this study included those of:

- participant observation;
- semi-structured interviewing at both formal and informal levels;
- the collection of work samples;
- the collection of related documents; and
- individual student assessments.

The commitment in this research was to understand and interpret in a holistic manner the classroom experiences of students with a diagnosis of Attention Deficit Hyperactivity Disorder. Multiple sources of evidence were used to portray an authentic picture of the ways in which these students interacted with their environment in order to understand more fully how the educational experiences of these students may be optimised.

Figure 5.1 provides a representation of how the research process was both developed and conducted. The research began with a broad interest in the area of students with a

diagnosis of ADHD and how they functioned in classrooms. This interest had developed from experience with these students, a reading of related literature and much anecdotal evidence from colleagues who also had experience with these students. This led to what Guba and Lincoln (1989) refer to as *tacit knowledge:* knowledge that has accumulated through relevant experience, and which, while not necessarily articulated, is one of the bases upon which the insights and propositions which emerge from naturalistic enquiry are grounded.

This broad interest and knowledge was followed by negotiated entry to the research sites, firstly the schools and then the individual classrooms. Stage One data collection commenced and the research questions were refined as progressive levels of analytic induction took place. This occurred as preliminary data were collected from classrooms, discussions were held with teachers and students, assessment of students took place and selection of classrooms and students to be involved in Stage Two data collection was negotiated.

Stage Two data collection continued the process of analytic induction and theoretical sampling in what Guba and Lincoln (1989, p. 178) refer to as the *"hermeneutic dialectic circle ....the continuous interplay of data collection and analysis".* Timed observations in classrooms, narrative recording, further post-observation interviews with participants, formal interviews of parents and teachers and the collection of related documents and work samples contributed to this process.

As findings emerged, they were *grounded* or validated through a process of returning to the field, collecting further data to test the developing propositions and inviting the comment and critique of participants. As an understanding grew of the relationships that exist between students with ADHD and the various elements of their classrooms, a model of effective teaching for students with ADHD was developed.

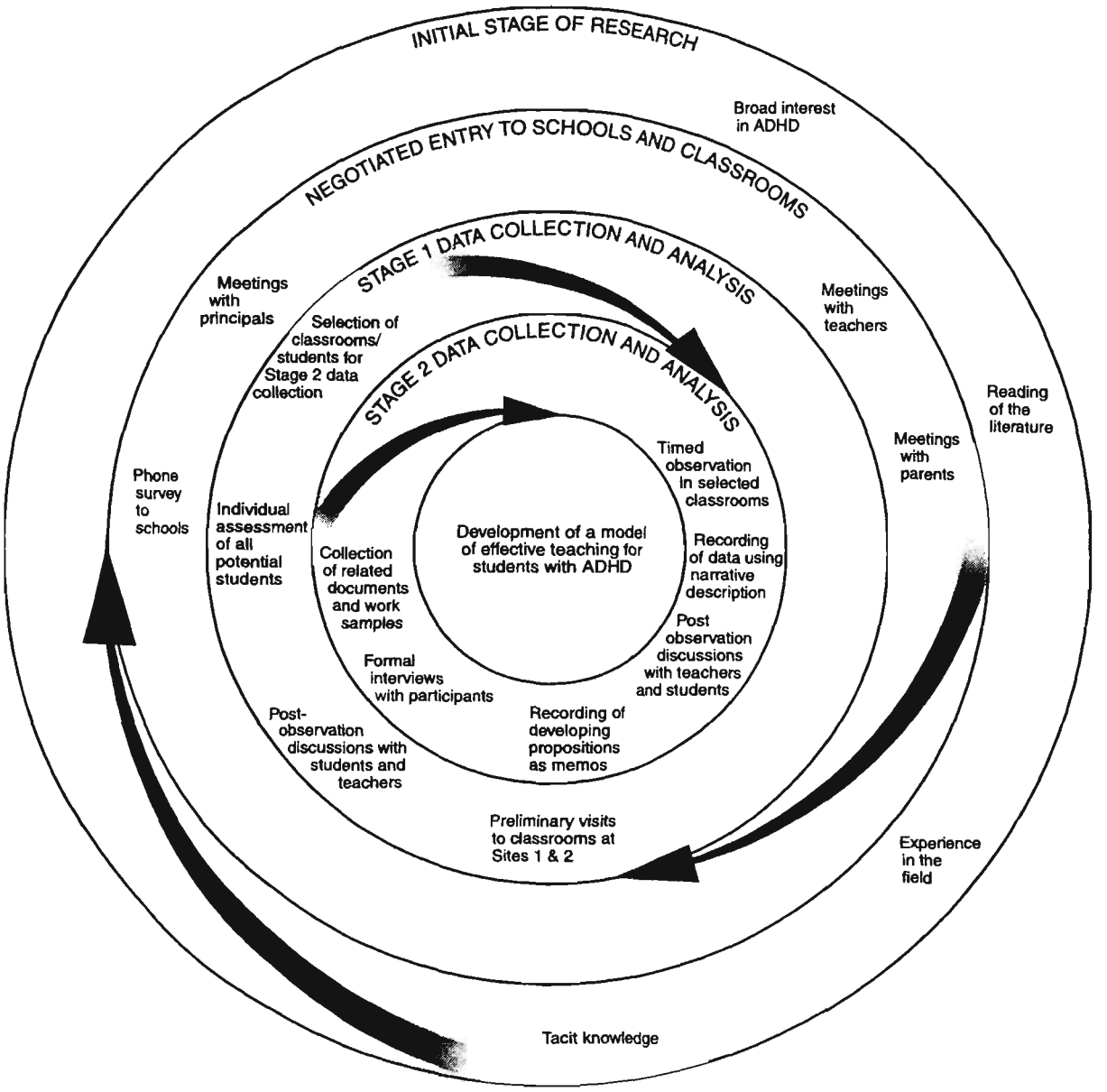

Figure 1: A Representation of the Research Process used in this Thesis

The qualitative research approach and the multiple-case study design were used in this study to broaden understanding of the relationships that exist between students with ADHD and the complex ecology of their classrooms. As stated previously, research in the area of attention deficit disorder has largely emerged from the fields of medicine and psychology, and has been conducted most often in clinical or laboratory settings. There has been little direct investigation of their development in the classrooms in which they spend so much of their time (Fiore & Becker, 1994). This study addressed the need for classroom-based research into the specific needs of students diagnosed with ADHD.

The discussion regarding negotiation of entry to the research sites and the data collection processes may be more clearly understood after preliminary reference to a timeline of these procedures. Table 5.1 provides an overview of the data collection activity.

Table 5.1
Timeline of Data Collection Procedures

Time period	Data collection procedure
October - December, 1995	• Negotiation of entry to research sites • Two schools selected • Ethics clearance sought and gained
February, 1996	• Meetings with staff and parents at both sites for explanation of proposed research • Consent negotiated with participants
March - June, 1996	**STAGE ONE DATA COLLECTION** • Preliminary visits as active participant to two classrooms at Site One • Preliminary visits as active participant to nine classrooms at Site Two • Post-observation discussions with teacher and recording of field notes • Individual assessment of all potential students • Selection of classrooms/students for Stage Two of research
July - December, 1996	**STAGE TWO DATA COLLECTION** • Timed classroom observations in two classrooms at Site One and five classrooms at Site Two • Recording of observational data using narrative description • Post-observation interviews with teachers and students • Recording of field notes on proformas • Recording of memos regarding developing propositions • Formal interviews with principles, teachers and parents • Collection of related documents and work samples

5.3 NEGOTIATING THE RESEARCH SITES

The original focus of this study was students diagnosed with ADHD who were enrolled in their first year of school. In October, 1995, principals of all schools within one hour's travelling time of the researcher's workplace who had indicated to the (then named) Department of School Education that they were available as research sites, were contacted by phone to determine whether or not they were expecting Kindergarten students diagnosed with ADHD to enrol in the following school year, and if they did, whether or not they would be interested in discussing proposed research into this condition. Only seven schools responded positively to both questions, five of which had to their knowledge only one Kindergarten student diagnosed with ADHD due to enrol. These schools were scattered around the locality and data collection at all of them would not have been feasible within the planned time frame. It was decided to proceed with the two schools who each had two Kindergarten students enrolling.

Further discussion of the planned research topic with supervisors led to the decision that students from other grades be included in order to gain greater representativeness of the sample being studied. This strategy was recommended by Miles and Huberman (1997) as one of the ways in which errors in qualitative research may be minimised. The inclusion of older students helped establish whether or not certain behaviours of students diagnosed with ADHD were consistent across age groups and provided a cross-sectional "snapshot" of primary-aged students with ADHD.

The school at Site One preferred to limit the research to the Kindergarten grades in view of the fact that other research was being conducted in Years 3 to 6 at the school. The school at Site Two agreed to extend the research into other grades and identified a further fourteen students at the school who were diagnosed with ADHD.

In February, 1996, teachers and parents of the prospective participants at both schools were involved in further meetings and explanations of the proposed research before consent for involvement was requested. Parents with low levels of literacy had personal meetings during which the nature of the research was explained. Both parent sets at Site One agreed to involvement in the research and thirteen of the fourteen parent sets at Site Two also gave consent.

5.4 SETTINGS

5.4.1 Site One

The school at Site One exists in a well established *"lower to middle class community with a degree of upward mobility"* (interview with principal, 11/11/96). It was originally opened in 1959 to serve a small rural population. As the surrounding area became more populated both the school and the clientele changed. Significant refurbishment and the addition of new wings occurred in 1986 as the result of rapid development in the surrounding area. At the time of data collection, there was a combination of government housing and private dwellings surrounding the school, with many young families moving into the area and moving out as they become more established.

The school buildings and amenities are modern, well maintained and aesthetically pleasing. The playground includes large open areas. The entrance foyer of the administration block displays many examples of students' work, has "Welcome" written in twelve different languages and presents as positive and "people friendly".

At the time of data collection the school had an enrolment of 740 students and a staff of 27, which included a non-teaching principal, part-time librarian, an ESL teacher, an early childhood support teacher, a support teacher-learning difficulties (STLD), a

specialist teacher for students with mild intellectual disabilities, two Aboriginal educational aides and four administrative assistants.

There was a significant number of students (45 to 50) at the school who were non-English speaking on enrolment and 35 identified as Aboriginal or Torres Strait Islander.

The classes in each grade were parallel with a small number of composite classes. The principal and staff were all experienced teachers, the least experienced having taught for twelve years.

5.4.2 Site Two

The second site was a medium-sized primary school set on 3.5 hectares of ground in a southern suburb of Sydney. It was established at the current site in 1982, although the current buildings were erected in 1986. It was architecturally superior to the surrounding schools, with large classrooms, each of which had a "wet" area. During the period of investigation there were 20 classes with a total pupil enrolment of 560. In addition to the 20 class teachers, the school had the full-time support of a teacher/librarian and teacher for the mildly intellectually disabled class, and the part-time support of ESL (English as a Second Language) teacher, an Early Student Support teacher, and a Support Teacher-Learning Difficulties.

The staff was predominantly married and female, with a range of teaching experience and there were three longterm casual teachers on staff. One of the casual teachers, "Ed", had been particularly selected by the principal for a longterm placement on a difficult Year 5/6 class because of the relationship Ed appeared to develop with some of the more challenging students during brief casual appointments at the school. That particular casual teacher took part in this study. The principal, while acknowledging that there was a range of levels of enthusiasm and expertise among the staff, referred to

them as a *"have-a-go"* staff and the school as a *"moving"* rather than a *"stuck"* school (interview with principal, 4/5/96). The principal operated very much on an open-door policy and was highly accessible to staff, students, parents and researchers. The school had been the site of several research projects during the current principal's tenure.

The school's management plan, developed by a committee with significant parent representation, devised an "Us skilling Us" program, with the aim of using the skills of the staff to broaden the expertise of other staff. This program recognised the talents of its own people and was felt to be a highly appropriate means of staff development.

5.5 DATA COLLECTION AND RECORDING PROCEDURES

5.5.1 Classroom Observations: Stage One

The classroom observations followed different patterns and were designed for different purposes in each of the two separate stages of the research. The first stage of data collection which took place during the first two terms of 1996 was designed:

- to gain a broad understanding of how students with ADHD were operating in the classrooms at the two different research sites;
- to familiarise the students with the researcher;
- to gain information about the students' functional levels of ability;
- to decide which specific students would take part in the more focused observations later in the year;
- to determine the comfort levels of the teachers who had agreed to be involved; and
- to focus the research questions.

A more detailed discussion of the two stages of classroom observation periods will provide an audit trail of this part of the research.

During the first two terms of 1996, weekly or fortnightly visits were made to the two schools. Time was spent in the two classrooms at Site One in which target students were located in order to familiarise the children with the researcher. The researcher assisted in the classroom, taking the role of an active participant. A minimum of eight visits was made to each classroom at Site One for periods ranging from one to two hours. Detailed observation records could not be made while the researcher was actively involved in classroom activity. At the conclusion of the observation periods there were discussions with the teacher concerning the observed activity. Field notes were recorded as soon as possible after each of these sessions (an example has been included as Appendix B1).

Also during this period the students' receptive language, using the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981) and phonological development, using the Sutherland Phonological Awareness Test (Neilson, 1995) were assessed. This was done in order to have some understanding of the functional ability of the students and also to provide some return to the teachers involved, in recognition of their co-operation in the research process. At Site One all students in each of the two Kindergarten classes were assessed at the request of the principal. This was followed up by further assessment of all students in the Kindergarten classes at Site One at the end of the year and the writing of personal reports on each child which were sent home. In those cases where language or phonological problems were detected, suggestions for follow up activities were included.

At Site Two thirteen students with a diagnosis of ADHD were originally considered for inclusion in the study. The parents of each of these students had given consent for them to be involved in the study. One student was excluded early in the investigation when it was discovered that informed consent could not be guaranteed, as discussed in Chapter Six. Each of these students was assessed using the Sutherland Phonological Awareness Test (Neilson, 1995) and the Peabody Picture Vocabulary Test (Dunn &

Dunn, 1981). One or two periods of observation, ranging from 60 to 90 minutes, were spent in the classrooms of these students throughout the first few weeks of the year.

This period of the research corresponded to the *"initial stage"* (Burns, 1994) referred to earlier in this chapter. These preliminary observation periods enabled the researcher to make some decisions about which students from Site Two to include in the more detailed study planned for the second half of the year. Guiding principles were the need to make the final sample as representative as possible (Miles & Huberman, 1994), and to ensure that class teachers were genuinely willing to be involved (Miles & Huberman, 1994).

While all teachers had consented to be involved in the research there were clearly varying degrees of enthusiasm and "comfort levels" with the idea of having a researcher in their classrooms taking detailed notes for two school terms. The delicate process of negotiating entry into individual classrooms for an extended period required a considerable commitment of time during the first half of the year. Clearly, if either the teacher or any students displayed significant discomfort with the researcher's presence, or significantly different behaviour, such researcher effects would affect the validity of the data. Efforts made to counter these effects in the second stage of data collection are discussed in Chapter Seven.

5.5.1.i Selection of Classrooms for Detailed Observations

After several weeks of preliminary observations at Site Two brief descriptions of each of the children and the classrooms were made to assist in the selection of classrooms in which detailed observations would take place. These summaries were shared with the two supervisors of the research and three other experienced qualitative researchers. Each classroom site was discussed with reference to the target child, the perceived

comfort level of the class teacher, and any other factor which may have relevance to the research.

As only two Kindergarten students were available at Site One both of these were selected in order to increase the representativeness of the sample. At Site Two it was decided to collect more comprehensive data on the following students:

- the two Kindergarten children, which would provide comparative data with the Site One Kindergarten students;
- a year 3 student in a composite 2/3 class whose behaviour was highly typical of ADHD, and whose teachers shared considerable enthusiasm for the project;
- a Year 4 class in which five students with ADHD were placed (only four of whom were to be involved in the study), one of whom was highly typical and unmedicated; and
- a Year 6 student whose behaviour appeared to be quite different from other diagnosed students. It is recommended that *"following up surprises"* (Miles & Huberman, 1994) is a useful way of increasing understanding about certain phenomena.

Other classes were not selected for the following reasons:

- in one case the teacher appeared to be extremely anxious about having an observer in the classroom;
- the target student in another class had an extremely severe behaviour disorder and the presence of an observer would have added another unknown variable to an already highly stressful setting; and
- the indicators of ADHD in other students were considerably milder and it was felt that greater information would be gained from observing those students who manifested more severe symptoms.

The selected sample was designed:

- to provide as representative a sample as possible (by including students of various ages), and by selecting students with the most typical characteristics of the disorder);
- to limit researcher effects (by excluding the extremely anxious teacher and the class with the severely behaviour-disordered student);
- to allow for comparisons and contrasts (by including four kindergarten students, two from each site);
- to investigate outlier cases (by including the atypical student); and
- to replicate findings (by using two separate sites).

These strategies were all proposed by Miles and Huberman (1994) as ways in which typical sources of error in qualitative research could be counteracted. Once the final students had been selected further periods were spent in their classrooms throughout the first two terms in order to understand more fully how the classes, and the teacher and students within them, operated together. In most cases a total of eight preliminary observation periods were spent in each of these classrooms.

5.5.1.ii Participants

The following summary information is provided to orient the reader to the student and teacher sample. The names of the children and the teachers have been changed for reasons of confidentiality. More detailed student information is presented in the findings chapters.

Table 5.2 provides a summary of the two students who participated in Stage Two data collection at Site One.

Kyle demonstrated typical ADHD (combined type) behaviour. There did not appear to be significant comorbid factors which may have confused the issue of how students with ADHD behave in a Kindergarten classroom.

Bonnie was the only female included in the data pool. Her behaviour was very different from that of her peers. Although Bonnie was in almost constant motion, her movements were slow and deliberate, rather than hyperactive or impulsive. She was highly distractible and rarely completed set tasks. She did not respond to group or individual instructions and infrequently engaged in conforming behaviour.

Table 5.2

Summary of Participants at Site One

Student	Grade	Diagnosis	Behaviour	Acad Perf	Teacher
Kyle	Kindergarten	ADHD-combined type Ritalin 3xday	High levels hyperactivity, impulsivity & distractibility	Low average	Female; member of executive staff; 20 years experience
Bonnie	Kindergarten	Specific diagnosis unknown Ritalin 3xday	Passive oppositional; highly distractible	Significantly below average	Female; 20 years experience

Table 5.3 provides a summary of the eight students who participated in Stage Two data collection at Site Two.

James was diagnosed with ADHD of the combined type. His behaviour was highly variable. Administrative staff regularly reported his hyperactive behaviour when he went to the office for his medication and this was witnessed several times by the researcher. In the classroom setting this behaviour was rarely seen although distracted behaviour was the norm.

Bailey had no formal diagnosis but was included at the particular request of the teacher who felt an official diagnosis was *"just a matter of time"*(teacher interview, 20/3/96). Bailey's parents were happy for him to participate as they often had difficulty managing him. Bailey's behaviour was highly variable: on occasions he was "invisible" in the classroom; on others he displayed highly impulsive and hyperactive behaviour, although there were few signs of distractibility. Bailey was not used as a focus child in the writing up of this thesis because of his lack of formal diagnosis, but observations in his classroom provided useful data on how difficult behaviours may be managed.

Ricky's behaviour typified ADHD of the combined type. Ricky's school experiences afforded the opportunity to observe his behaviour with four different teachers on a regular basis. He was placed in a composite 2/3 class which was shared by two permanent part-time teachers. During twelve weeks of the intensive observation period Ricky attended the Intensive Reading class every morning (9.00 - 1.00) which was also taught by two different teachers within that period due to a period of long service leave taken by the regular Intensive Reading teacher. Ricky's behaviour was quite different with each of these teachers which provided interesting comparative data.

Mitchell, in Year 4, displayed behaviours which were typical of ADHD of the combined type and was unmedicated. His highly distractible, hyperactive and impulsive behaviour dominated the classroom and the teacher's time. Mitchell had an assessed Intelligence Quotient of 127 (which was assumed to be suppressed) and the class contained several very high achieving students. Mitchell's class also included four other students diagnosed with ADHD, three of whom were involved in the study: **Mark, Toby** and **Paul**. Toby had been integrated into the class part way through the year from a specialist class for students with mild intellectual disabilities. The data collected on Mark, Toby and Paul were not as detailed as for most other students as it was not possible to record detailed field notes on all four students simultaneously.

Nevertheless, some significant observations were made regarding these students which are discussed at the appropriate points.

Eric, a Year 6 student, was selected because he did *not* present as typical of a student with ADHD and the stories of such "atypical" students need to be explored (Miles & Huberman, 1994). Although he presented as extremely disorganised, he was almost always on task and was achieving highly despite having attended the Intensive Reading class just two years previously.

Table 5.3
Summary of Participants at Site Two

Student	Grade	Diagnosis	Behaviour	Acad Perf	Teacher(s)
James	Kindergarten	ADHD combined type Ritalin 3xday	variable	Average	female; 3 years experience
Bailey	Kindergarten	No formal diagnosis	highly variable	Average	female; 5 years experience
Ricky	Year 3 of 2/3 composite	ADHD combined type Ritalin 3xday	highly variable	Below average	4 different teachers; see notes
* Mitchell	Year 4	ADHD combined type Ritalin 3xday	high levels hyperactivity, impulsivity & distractibility	Below average despite IQ 127	female; 12 years experience
* Mark	Year 4	ADHD combined type Ritalin 3xday	dependent on medication	Above average	female; 12 years experience
* Toby	Year 4	ADHD Type 1 Ritalin 3xday	highly distractible; no hyperactivity or impulsivity	Sig. below average; mildly intellectually disabled	female; 12 years experience
* Paul	Year 4	ADHD combined type Ritalin 3xday	flattened affect; task avoidance; no hyperactivity, impulsivity	Low average	female; 12 years experience
Eric	Year 6 of 5/6 composite	ADHD combined type Ritalin 3xday	attentive; disorganised; no hyperactivity or impulsivity	Above average	male; 1 year's experience

*** Four boys in same year 4 class**

5.5.1.iii Confirming the Diagnoses of ADHD

Paediatricians were approached (in cases where the parents had given consent for this to occur) to ascertain how the diagnosis of ADHD for each student was made. This was deemed important to ensure the internal validity of the research: to confirm that the students, particularly those who were not medicated, had a formal diagnosis of ADHD. Letters explaining the research (see Appendix C) were sent requesting information on how the diagnosis of ADHD was made and what instruments were used. Follow-up telephone calls were made to each practice and the required information was provided over the phone. In most cases the paediatricians were aware of the research being undertaken as it had been mentioned by parents during regular consultations.

It was confirmed that, of the ten students involved in the intensive data collection, eight had been diagnosed using criteria recommended by the National Health and Medical Research Council report (Carmichael et al., 1997). Bonnie's paediatrician was not identified by her parents but she was taking Ritalin prescribed in her name at school, thus some formal identification had taken place. Bailey had no formal diagnosis, as reported earlier in this chapter.

5.5.2 Classroom Observations: Stage Two

The second stage of data collection was designed to:

- gather more detailed information on the selected students' experiences through timed observations of their various learning environments (that is, classrooms, libraries, playground, and so on); and
- to gather this information across samples of all periods of the day and all days of the week.

Having selected seven classrooms at two different sites in which ten students were to be observed, a schedule was drawn up which would allow all students to be observed

across all days of the week and during different periods of the day. Originally (and highly optimistically) 45 periods of intense observation were planned for each student. Once such inevitable factors as child absences, teacher absences, observer illness, school excursions, parent interviews, and so on were accounted for, patterns of observation occurred as per Tables 5.4 and 5.5. [Observations conducted of sports periods supervised by other teachers, of one-to-one tutoring sessions conducted by parents, of playground behaviour and of behaviour on excursions outside the school have not been included in the following tables for ease of analysis.] The asterisks represent preliminary classroom visits made during Stage One of data collection. Each dot point represents a period of timed observation during either Term Three or Term Four which constituted Stage Two of data collection.

5.5.2.i Observation Patterns

Tables 5.4 and 5.5 demonstrate the patterns of observations. There was a spread of observations ranging from 10 to 90 minutes' duration throughout the week and during different periods of the day for each of the target students although the pattern is not entirely consistent for each student. Such factors as time of day or day of the week which may have an effect on behaviour were addressed by the broad sampling of observation periods.

Table 5.4
Observation Patterns at Site One
A: Observation patterns of Kyle – *8 preliminary observations and •35 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	••	*•••••	*•	•	*•
11-1	•••	*•••	••••	*••	**••
1-3	••••		•••••	••	*

B: Observation patterns of Bonnie – *8 preliminary observations and •24 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	•••	*••	*••	*••	**•
11-1	•	•••	•	••	*••
1-3	••	*•	•		*•

Table 5.5

Observation Patterns at Site Two

A: Observation patterns of Bailey – *8 preliminary observations and •35 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	••	•	*••	*•	*•••
11-1	*••	•••	*••••	••••	•••
1-3	*•••	*•••	•	•	*••

B: Observation patterns of James – *8 preliminary observations and •35 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	*••	•••••	*•	*••	•
11-1	••	*•••	*••••	••	*•
1-3	*••••		••••••	••	*

C: Observation patterns of Ricky – *8 preliminary observations and •30 timed observations with letters referring to different teachers

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	H	*CCHRR	*	HHR	*H
11-1	HRRR	CC	R	*JJHHR	*H
1-3	*CCC	C	*	JJ	*J

D: Observation patterns of Mitchell – *8 preliminary observations and •31 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	••	*••	*•	•••	
11-1		•••	*•	•••	*••
1-3	••••••	•••	*•••	*•	**•

E: Observation patterns of Toby – *5 preliminary observations and •25 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	••	*•	*	••	
11-1		•••	*•	•••	*••
1-3	••••	•••	•••	*•	

F: Observation patterns of Mark – *8 preliminary observations and •29 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11		*••	*•	•••	
11-1		•••	*•	•••	*••
1-3	••••••	•••	*•••	*•	**•

G: Observation patterns of Paul – *6 preliminary observations and •27 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11			•	••	•
11-1		•••	*•	•••	*••
1-3	••••••	•••	*•••	*•	**•

Note: Paul was withdrawn on Monday and Tuesday mornings to attend special reading classes so he was not observed during those periods.

H: Observation patterns of Eric – *7 preliminary observations and •20 timed observations

Approx time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
9-11	••		•	•••	*•
11-1	•	*••	*•	•	**•
1-3	•	••	*••	*••	

The patterns of observation allowed constant return to the classrooms over an extended period of time to explore and refine the research questions and to test developing propositions as they emerged from the data. These are requirements of qualitative research and assisted in the development of the effective teaching model which evolved from this study.

Observations in the classrooms also afforded the opportunity to examine the behaviour of the students with ADHD in their natural learning environments. This is consistent with Bronfenbrenner's (1979) view that behaviour can only be understood in its natural context.

5.5.2.ii Recording of Observational Data

Stage Two of this study used narrative description, a real-time method of data recording in which as much as possible that was relevant was recorded as it happened. This was used in preference to a time-sampling method in which the recorder, using a timepiece, records only those events which occur, for example, every thirty seconds, with events/interactions between those times not being recorded. The choice of narrative descriptions meant that the context could be richly described, the natural sequence of events preserved, and unpredicted events recorded.

- ***Field notes***

Handwritten field notes were recorded during the observation periods using a combination of longhand and an idiosyncratic shorthand (which developed as the observations continued) in an attempt to record as much as possible of the classroom activity involving the target student. The primary focus during the actual observation was on the target student but other relevant material was also recorded when possible. Such material included how settled or distracted the rest of the class was at certain times, the level of movement, entry of visitors and so on. This was done in order to provide as full a context as possible for the observations.

Observations were recorded on almost a minute by minute basis, although at times this was difficult because of the rapid note taking that needed to take place in order to record the activity of a child diagnosed with ADHD. There was a particular attempt made throughout the observations to record verbatim the words spoken by, or to, the target

students although it is acknowledged that this was not possible on all occasions. Despite the fact that a complete picture of the complex interactions that constitute a classroom could not possibly be recorded under these circumstances, the narrative description did provide a great deal of highly relevant information (see Appendix B2 for an example).

In the classroom in which there were four targetted students, observations focused on Mitchell whose behaviour was a dominating factor in the classroom. Some data were recorded on the other three students but these were far less detailed and had only a supporting, rather than in an integral, role to play in the development of the thesis.

At the conclusion of each observation period brief discussions occurred with the teacher and, where practical, the students regarding the lesson just observed. This constituted a level of member checking and provided opportunities for incidents to be followed up and individual perspectives on the preceding events to be gained. For example, the teacher may have been questioned regarding particular student behaviours, her perceptions of their cause(s), and so on. Students were sometimes asked why they did certain things. (These exchanges were necessarily brief and were often followed up later in the staff room with the teacher, or in the playground with the student.) If possible and practical, target student work (and occasionally other student work for comparative purposes) was photocopied at the conclusion of the observation period and filed.

- ***Preparation of field notes***

Field notes were word processed as soon as possible after each observation on a proforma which detailed time and date of the observation, general lesson content, whether or not a demonstration took place, and any other points of general relevance (such as the presence of work experience students or support teachers). These field

notes incorporated teacher and student comments, and included reflections and comments of the researcher on the raw observations. In this way, the prepared field notes provided the first stage of data organisation and analysis. For an example of prepared field notes, see Appendix B3.

5.5.2.iii Difficulties encountered with electronic recording

In view of the complex interactions that take place in a classroom it would have assisted data recording had it been possible to videotape or audiotape each observation period. According to departmental guidelines permission needed to be gained from the parents of *every* child in the observed classrooms for this to take place because of the fact that each child could potentially appear or be heard. Principals at both sites felt on the basis of their past experience that this permission was unlikely to be granted by *every* parent. Nevertheless, in view of the perceived advantages of such recordings, letters were drafted explaining the research and requesting permission to audio and/or videotape and posted to parents of two classes in each school. As predicted by the principals, although most parents gave consent, at least one in each class declined and no further attempts were made to gain permission. While this was disappointing, the rights of parents in these instances must be acknowledged; thus no electronic recording took place in the classrooms.

5.5.3 Interviews

5.5.3.i Teachers and Students

As mentioned previously, informal interviews occurred in the form of brief discussions with the teachers and target students after lesson observations. This was to follow up and garner individual perspectives on the preceding events.

More formal, focused interviews were conducted with each of the teachers in the study and also with other teachers in the schools who had taught target students in past years. These interviews explored teachers' perceptions of the causes of ADHD and their beliefs concerning how it should be managed. The interviews were conducted in the final weeks of data collection when the most comfortable relationship had developed between teachers and the researcher. The interview schedule is included as Appendix D1. Several of these interviews were recorded but not all due to a failure of equipment.

5.5.3.ii Principals

The principals of each of the schools were interviewed regarding demographic information on the schools, the student and staff populations, relevant school policies and beliefs concerning ADHD. The interview schedule may be seen as Appendix D2. Information regarding school policies on student placement and how casual teachers were appointed were of particular relevance to this research.

5.5.3.iii Parents

A great deal of informal contact occurred with the parents of the Kindergarten children as they arrived to deliver or pick up their children or when they were involved in class reading groups. There was also informal contact with parents of the older students on such occasions as the school Open Day, a market day and a school sports day. These spontaneous exchanges provided unplanned opportunities to develop greater understanding of the parents' perceptions of their children and their children's behaviour.

Formal, open-ended but focused interviews were conducted with at least one parent of each of the children involved in the study, including parents whose children were not selected for the fuller observations. The only exception was with one mother with whom a breakdown in the relationship occurred as explained in Chapter Six. In these

interviews background information on the children was obtained as was information regarding parents' beliefs about ADHD, its causes, drug therapy, medication effects, the children's behaviour at home and strategies they found useful in managing the behaviours. The interview schedule may be seen in Appendix D3.

Some interviews with parents were audiotaped, however, most were not. While most interviewees agreed to this procedure in initial consent agreements it was clear that for some, audiotaping the interview was considered to be intrusive. At this point a decision had to be made in favour of either the validity or the reliability of the data. Taped interviews can be checked for authenticity but the very existence of the tape recorder may affect the validity of the data. This is particularly the case when interviewing parents who may be in some distress or when the research focus is on very sensitive issues. Respect for research participants and consideration of their level of comfort with the process should always outweigh research considerations.

In this study there were, in several cases, sidelong glances, grimaces and references to the recorder during the initial stages of the interview. When this persisted for more than a few minutes it was the researcher's opinion that the interviewee's discomfort level would affect the integrity of the interview. In these cases interviewees were asked if they would prefer to have the tape turned off. In almost all cases this suggestion was gratefully received.

In doing this the researcher was responding to suggestions in the qualitative research literature (Bogdan & Biklen, 1992; Cassell, 1982; Evans & Jakupec, 1996; Kiegelmann, 1996) to ensure throughout all periods of the research that consent was ongoing. A signed form at one point may not ensure consent at a later date.

After the interviews the detailed notes that had been hand recorded were shown to the respondents as a form of member checking. They were invited to alter or remove any

material which they believed did not reflect their beliefs or that they did not want to have included. No requests were made for removal of any material. This supports the view that the action taken by the researcher added to the validity of this part of the data.

5.5.3.iv Visitors to the School

Throughout the period of investigation many other visitors to the school were informally interviewed. ADHD is a topic of interest to many people and when the nature of the research being conducted at the schools became known the researcher became involved in many informal discussions on the topic. On several occasions the researcher was actively sought out as visitors wished to discuss individual experiences and perceptions of ADHD. This occurred with visitors on a Multicultural day, a visiting illustrator, an acting group and members of an historical society. In all six "interviews" of this nature occurred after which field notes were recorded to add to the data base. As most of these individuals were responding as parents of children diagnosed with ADHD a fuller understanding of the parents' perspective was gained.

These occurrences also attested to the fact that the researcher had become an accepted part of the school community which is an integral component of qualitative research. Having visitors to the school directed to the researcher by different staff members suggests that the research being conducted was considered valid and worthwhile by these stakeholders.

5.5.4 Collection of Work Samples

Work samples were collected, photocopied and filed after timed observation periods where this was practical to document the quantity and quality of the students' output. This did not occur with group products where individual contributions were difficult to identify. On occasions samples from other children in the class were also photocopied and filed in order to compare the output of target students and their peers. As work

output is one measure of academic engagement, it was noteworthy to compare the products of students with ADHD and those of their peers. On one occasion the photocopied page of a target student's book revealed a collection of headings with no actual working evident over a period of weeks (see Appendix E1).

5.5.5 Collection of Related Documents

On occasions throughout the period of the research, staff would share related material with the researcher. Items of this nature included newspaper articles concerning ADHD and proposed new treatments. This contributed little to the actual data base of the research but was evidence of the interest level and engagement of the teachers in the project, even those who were not directly involved in the study. This also suggested a level of acceptance of the researcher on site which is of considerable significance in qualitative research.

5.5.6 Assessment Data

All students were assessed for receptive language [using the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981)] and phonological ability [using the Sutherland Phonological Awareness Test (Neilson, 1995)] This information was useful in understanding the functional ability of the students and provided the researcher with opportunities to interact with the students on a one-to-one basis.

5.6 DATA ORGANISATION

5.6.1 Observation data

Original and prepared field notes were filed in ten individual student folders. Having field notes on each individual student filed separately facilitated initial coding.

Work samples were also filed in the students' folders with the relevant field notes.

Interview data were filed in separate folders for teachers and parents once they had been validated by the interviewees as accurately reflecting their beliefs and verified as not containing any material they did not wish to have included. Transcripts were not made of the taped interviews.

A contact summary file was kept to record different sources of evidence including those individuals contacted and/or interviewed in relation to this research. Members of school executive, teachers, clerical staff, parents, students, visitors to the school and paediatricians are included in this file. The roles these individuals played – for example, parent or casual teacher – were listed and not individual names.

A document summary file evolved which housed all documents apart from students' work samples which were collected in relation to the research. Examples of these documents included material collected at a staff development day held at one of the sites, reports of different treatments approaches, and newspaper cuttings relating to ADHD given to the researcher by different teachers.

An analytic file was kept to maintain records of propositions, possible interpretations and early representations of what emerged later as categories and relationships. These were referred to as *memos* and appear in relevant sections of the Results chapters (Eight to Twelve) of this thesis. Also contained within this file were preliminary conceptualisations which were not supported by the data as the research progressed.

5.7 CHAPTER SUMMARY

This chapter has provided a justification for the research paradigm used in the investigation of the interaction of students diagnosed with ADHD and the ecology of their classrooms. The specific research procedures used in the conduct of the study have been explained. The processes of negotiation into the research site and the various data collection and recording procedures have been detailed.

Before proceeding to outline the data analysis procedures a range of ethical issues which emerged throughout the data collection period will be discussed in the next chapter in order to fulfil the researcher's responsibility to disclose any material which may have affected the operation of the research.

CHAPTER SIX

ETHICAL CONSIDERATIONS WHICH EMERGED THROUGHOUT THE CONDUCT OF THIS RESEARCH

Several ethical dilemmas arose throughout the data collection period. By its very nature, qualitative research is immersed in a *"messy, chaotic reality of on-the-spot personal interaction...sensitivity and experience"* (Holbrook, 1997, p. 49). This immersion into *"chaotic reality"* certainly occurred on occasions throughout the study reported here.

The following issues, and how they affected the progress of the study reported in this thesis, are discussed in this chapter:

- the issue of informed consent;
- the issue of confidentiality;
- the issue of individual realities; and
- the issue of researcher versus counsellor.

6.1 THE ISSUE OF INFORMED CONSENT

Informed consent is seen to be one of the most critical issues in qualitative research; indeed, it is regarded by some (Bogdan & Biklen, 1992; Burgess, 1989; Cassell, 1982) as the key issue in research with human beings. While covert research is claimed to have some validity if it is used to expose malpractice or corruption (Punch, 1986), or if there is no risk to the participants (Fine, 1992), it is largely rejected and is seen by many as being intrinsically wrong. Kiegelmann (1996) stresses that the foremost consideration in research should be given to the dignity of the research participants and that on these grounds alone, deception in research can never be condoned.

Particular problems relating to informed consent arose on two occasions throughout this research. In the first case, a prospective participant's mother had received a letter explaining the proposed project and extending an invitation to attend a meeting at which further details regarding the research would be provided. Although the mother did not attend the meeting, she sent written approval for her son to participate in the study. Subsequently it was discovered through an indiscreet disclosure by a staff member that this particular mother was undergoing treatment for a severe psychiatric condition. After discussion with the principal of the school it was decided that it was not possible to ensure that "informed" consent had been obtained and therefore that particular child was excluded from the study. In this case the decision appeared to be quite straightforward.

In the second case the primary caregiver was not literate and so was unable to read the explanatory note. The child's teacher and the researcher explained the purpose of the research personally to the mother who expressed willingness for both her and her child to be involved.

On subsequent occasions when the investigator was attempting to arrange interview times the mother was unable to participate in the discussions because of her extreme agitation about unrelated matters. The mother appeared to be totally unaware of the research under discussion. After three attempts to explain the project and arrange interview times it was decided that the ethical way forward would be to exclude that particular child from the study as informed consent did not appear to have occurred. Observations on that child ceased from that point. Shortly afterward the mother approached the investigator and asked when she could be interviewed, and appeared to be fully cognisant of the research. Discussion with the class teacher, the principal and the research supervisor led to an agreement that the mother appeared to be genuinely consensual for her child to be part of the study and so the child was once again included.

As the study progressed, this mother would often spend considerable time talking to the researcher when she dropped off her two children at school and there was no indication that she had any concerns about the research. On one occasion during the final days of data collection, as the researcher approached the mother, she reacted in quite a startled manner and ran from the school grounds. This pattern of behaviour continued from that point on. Attempts by staff members to determine the cause of her behaviour resulted in the discovery that the mother had connected the presence of the researcher with the principal's reporting of suspected child abuse. The mother now believed that the investigator was a representative of the Department of Community Services and wanted to interview her regarding child abuse.

This pattern of behaviour strongly suggested that the mother was not in a position to make clear judgements. While she did not officially withdraw her consent, it was clear that she was no longer comfortable with any level of involvement with the researcher. Did this mean that her daughter (the only female in the sample) should be removed from the study in its final days and that all data collected to that point discarded? Would new understandings that may arise from analysis of data involving her daughter justify her continued involvement as a participant? If, as has been suggested by Fraenkel and Wallen (1990), the central ethical question for all researchers is "Will any physical or psychological damage come to anyone as a result of this?" the answer in this case is probably "no". The mother was not concerned about the classroom research which involved her daughter, but about possible intervention from a supposed Department of Community Services agent.

Debriefings with stakeholders such as the principal and class teacher, and with other experienced qualitative researchers, did not result in any definitive answer. As pointed out by the principal, the young student played an important part in the research as the only female in the group and the investigation was likely to throw more light on the perplexing condition of ADHD. The mother had at no time objected to the classroom

research being conducted and in fact showed a great interest in it. It was not the research or the researcher she was attempting to escape but rather a fantasy figure and situation she had created. The class teacher believed that no harm could arise from using the data collected on the young girl and that should be the guiding principle.

Continued discussion with stakeholders in the research, supervisors and other qualitative researchers was critical in the conduct of this research, but even experienced researchers differed in their opinions, with some recommending use of the data and others saying that, if there were any concerns, withdrawal was the safest option. Data on that student were not withdrawn from the study although she was not used as a focus child in the writing up of this thesis and information gained from the informal interviews with the mother was not used.

This issue did highlight, however, that in qualitative research informed consent needs to be sought at regular intervals throughout a research process rather than only prior to its commencement. This should go beyond the usual statements that consent may be withdrawn at any time and should include direct discussion regarding the progress of the research and the participants' continued willingness to be involved. Cassell (1982) points out that it is almost self-contradictory to obtain informed consent when employing an emergent research design.

6.2 THE ISSUE OF CONFIDENTIALITY

The issue of confidentially is one which underpins all qualitative research (Fraenkel & Wallen, 1990; Raffe, Blundell, & Bibby, 1989) and is seen to be a major issue in such research. Throughout this study the researcher became a familiar figure to many of the parents whose children were participants in the study. This arose chiefly because the parents would often linger after dropping their children off at the school, apparently keen to just "have a chat" about their children.

While this arrangement greatly facilitated the development of a high level of rapport with the parents, on several occasions by the time the formal interview took place, and on some occasions merely as part of the informal chats which occurred of a morning, some highly personal revelations were made. Spontaneous and intimate disclosures are not uncommon in qualitative investigations (Rowling, 1994). In this research these disclosures included those of drug use and distribution, unregistered firearms in a highly unstable home, sexual assault (of the mother) and on one occasion of child abuse. Suggestions that relevant agencies be contacted were not acted upon.

Private lines of enquiry revealed that the drug use and distribution had been reported to the local police but was not considered to be serious enough to warrant immediate action as it was felt that there was little chance of a conviction. On the last day of the weapons amnesty in force at the time, the unregistered firearms were handed in and, coincidentally, the suspected child abuse was reported by the principal of the school. In each of these cases the researcher did nothing. Confidentiality was maintained. But in each of the cases there could have been serious repercussions. It is possible that these disclosures were meant to force action on the researcher's part: to, in effect, pass on the responsibility of reporting to another person. As pointed out by Bogdan and Biklen (1992), researchers surely have obligations as citizens as well as obligations which their research places on them. At what point does moral responsibility outweigh the confidentiality that Ethics Committees demand? While no serious consequences resulted from the researcher's lack of action, these instances certainly raised questions concerning the difficulties encountered in the conduct of qualitative research.

6.3 THE ISSUE OF INDIVIDUAL REALITIES

In qualitative research, the commitment is to understand and interpret processes which are occurring in their natural settings in a holistic manner, acknowledging that there are multiple realities. All efforts are directed toward reflecting the viewpoint of the

individuals directly involved in the phenomena being studied. There is no attempt made to alter any participant's view of reality. Should this, then, still be the case when "reflective listening" and "acceptance of individual realities" involve reflecting damaging personal beliefs?

When interviewing the parents of one particular child and questions were raised about their beliefs concerning the cause(s) of ADHD, the mother stated quite spontaneously that she always believed it had been because their son had not been planned as their first child had been, and that perhaps the ADHD was the result of her son responding to some subtle awareness of this. She then became quite distressed, as did her husband who "confessed" that he believed that also. This was apparently their first articulation of this shared belief and the level of distress was such that it was difficult for the researcher to know how to proceed. Qualitative research strives to reflect the beliefs of the participants but there seemed to be in this case needless suffering based on faulty beliefs.

The researcher was not sure how to proceed. These beliefs were the source of considerable pain to the participants. The beliefs have no scientific support. Would it be damaging or helpful to question these beliefs? To what extent do researchers have a responsibility to accept the beliefs of the participants, even beliefs that appear to be faulty or dangerous?

The investigator made references to children with a diagnosis of ADHD who had been adopted and so clearly wanted, and to other children who were the result of IVF treatments and so carefully planned, who also had a diagnosis of ADHD. There was also mention of the fact that "unplanned did not necessarily mean unwanted".

The explanation – "unplanned does not necessarily mean unwanted" – appeared to be of comfort to them and they seemed surprised and relieved to hear of adopted children

having ADHD. When the interview transcript was being read back to the parents and they were asked if they would like any material deleted, they elected to have the material remain intact. This suggests that gently challenging rather than reflecting their beliefs had a positive outcome, although this is not generally perceived to be part of the qualitative researcher's role.

Rowling (1994) recommends the return of interview transcripts to interviewees for confirmation as one technique which is aimed at protecting their interests. This certainly seemed appropriate in this case. The parents had the opportunity to state that they were happy for the transcript to remain unaltered. This does not, however, help in determining whether or not the discussion recorded was appropriate, and whether the investigator followed the appropriate course.

6.4 THE ISSUE OF RESEARCHER VERSUS COUNSELLOR

Some difficulties emerged in this thesis precisely because a high level of rapport, so essential for many aspects of qualitative research, had been established between investigator and participant. That which was required for the research to be valid was also the catalyst for a complex array of highly-charged interpersonal issues to emerge. Participating over a period of time with a group of people in order to "tell their stories", which is in effect what a qualitative researcher tries to do, often involves the formation of close relationships among the participants. Parents of children with special needs are often undergoing periods of intense stress and greatly in need of personal support. It is not uncommon that the researcher, a person who by definition has a great interest in the lives of the participants, is seen to be a source of information and particular support.

In cases where a relationship extends over a period of time a dependent relationship can develop. An extreme example of this occurred with the mother of one of the

participants, a particularly challenging young boy. There was a high level of instability, physical violence and disruption in his home. His mother was genuinely concerned for the welfare of her children but her own coping resources were severely taxed by her circumstances, leaving her little time or energy to address the problems directly.

During the interview with the student's mother many personal issues emerged and it was clear that she would benefit from professional counselling. Suggestions were made by the researcher to the effect that professional help should be sought, however, attempts to direct her to relevant services were not successful.

The researcher had provided details of when she would be at the school with the usual advice that she could be contacted at any time for information about the project. Requests from the mother for additional home visits began soon after the interview and became more and more frequent as his mother's ability to cope deteriorated. If the researcher was not available to visit (and the school administrative staff tried to relay this message), the mother would arrive at the school in a distressed state. The school counsellor, the school principal, and various other members of the teaching and clerical staff became involved at different stages in an effort to assist the mother to access appropriate services. This situation was not relieved until the data collection period ended.

Clearly the professional and the personal interactions had become confused but at precisely which point it was difficult to judge. Early interactions with the mother suggested that a difficult time was being experienced but there was little indication that the behaviour would become extreme. There is also a continuing sense that the mother felt greatly let down by the whole process. The research was presented as something which was aimed at helping both parents and teachers understand the behaviour of students diagnosed with Attention Deficit Hyperactivity Disorder and indeed this was

the intention. It was as if the mother saw this as a promised source of support which failed to deliver.

Thus, this period of data collection was not without its moral as well as practical difficulties and highlighted the need for researchers to be aware of responsibilities to the people involved, rather than to the research process alone. These difficulties also underscored the fact that, as Bronfenbrenner (1979) proposed, all elements of a system influence the functioning of that system. In this study, the presence of the researcher and the conduct of the research clearly had an impact on the way in which other people within that system operated.

Ethical issues such as those highlighted by this research have received little attention until comparatively recently (Bibby, 1997; Burgess, 1989). Bibby (1997) contends that few researchers have a clear understanding of both research methodology and the moral argument or theory which should guide decision-making processes when confronted with ethical dilemmas. It is important that researchers consider different moral arguments as part of their training and reflect on what is acceptable behaviour before beginning a research career. Postgraduate or research preparation programs should perhaps devote a little more time to consideration of different moral theories in order that a more carefully considered approach may be taken in some of the circumstances described in this thesis. Codes of ethics can only operate as a guide. There are no real solutions but there is "a *great need for researchers to regularly reflect on their work to develop their understanding of the ethical implications associated with social and educational investigation"* (Burgess, 1989).

Working with children with a range of special needs and their families, particularly in the more personalised areas of qualitative research, demands sensitivity and an increased awareness of the great vulnerability of many of these families. Their life circumstances are such that they are often placed under extreme levels of stress and are

therefore more likely to react in an unpredictable manner. The effects, short- or long-term, that research may have on the emotional well-being of participants must always be at the forefront of the researcher's consciousness as day-to-day decisions are made that guide the qualitative researcher in the field.

6.5 CHAPTER SUMMARY

This chapter has highlighted some of the moral and ethical considerations which arose throughout the conduct of this research. The issues of informed consent and confidentiality, and the difficulties of reflecting individual realities and of discriminating between a researcher's role and a counsellor's role all had an impact throughout the study reported in this thesis. Each of these issues arose because of the nature of the research and brought into sharp focus the responsibilities researchers have when permitted the privilege of entering people's lives.

Chapter Seven will outline the data analysis procedures which proceeded from the data collection and recording processes detailed in Chapter Five. As mentioned previously, data collection and analysis proceeded in a cyclical fashion throughout the conduct of this research, as is necessary when developing a theory which emerges from the phenomena it represents.

CHAPTER SEVEN

DATA ANALYSIS AND DISPLAY PROCEDURES

The overall aim of this study was to develop a model of classroom practice and organisation which would meet the needs of students with a diagnosis of ADHD. In order to do this, data were collected on students with this diagnosis over a period of one year. Chapter Five outlined the precise ways in which this was done, providing an audit trail of the procedures used.

In this chapter the data analysis procedures are outlined. Analysis proceeded in tandem with periods of data collection in order to test developing propositions and therefore ground them in the data, as per the diagram in Chapter Five. Each step of the data analysis is described separately to facilitate an understanding of this necessarily complex process.

7.1 ANALYSIS AND DISPLAY OF CLASSROOM OBSERVATIONAL DATA

7.1.1 Calculation of time on task and academic engaged time

This study focused on how students with ADHD function in regular classrooms. Thus, it was appropriate that the initial point of analysis be directed to any indicators of the functioning of these students. Because of the well documented link between time on task, academic engaged time and academic learning outcomes (as established in Chapter Four), and because the nature of the classroom observations allowed measures to be made of percentages of both time on task and AET, this was the first point of analysis.

Percentages of time on task and academic engaged time were calculated for each student for all timed observation periods which occurred during Terms Three and Four. This provided a broad overview of the students' performance in relation to a key aspect of this research; that is, how students with a diagnosis of ADHD manage in the classroom learning environment.

The characteristics of ADHD have been seen to predispose students with this diagnosis to learning and behavioural difficulties. This may contribute to loss of academic engaged time and time on task. The information presented reveals to what extent this occurred. In this way the broad impact of factors relating to the student on the microsystem of a classroom learning environment have been examined.

The Code for Instructional Structure and Student Academic Response (MS-CISSAR) - mainstream version (Carta, Greenwood, Schulte, Arreaga-Mayer, & Terry, 1988) was used to classify behaviour as either academically engaged (referred to by Carta et al as *academic responding*); on task (engaged in what Carta et al refer to as *task management*); or off task (engaged in what Carta et al refer to as *competing behaviours*). This instrument has undergone extensive validation and has been used to address a number of research questions focusing on the academic performance of students who are at risk of academic failure (Greenwood, 1991). Examples of each of the classifications used in this research, which were taken from the above instrument, have been included in the proceeding sections.

Academically engaged behaviour refers to behaviours which occurred directly in response to academic tasks, commands or prompts, such as:

- writing;
- manipulating objects relevant to task completion;
- reading aloud;
- reading silently; and

- engaging in verbal behaviours related to the academic task.

On task behaviour refers to the management of instructional tasks and materials and includes such behaviours as:

- raising hand to request help or in response to teacher question;
- playing with objects or peers as approved by the teacher such as talking with a friend after an assignment has been completed;
- handling, looking for, or using materials that are essential to the completion of an academic task, such as looking through a dictionary;
- lining up or moving from one part of the classroom to another such as during transitions between lessons;
- talking with peers in order to solicit assistance or clarification; and
- attending to media, the teacher or a peer during an academic task.

Off task behaviours are those behaviours that would interfere with academic responding or task management and/or those which would be unacceptable because they are against commonly accepted social conventions, classroom rules or teacher directions, including:

- aggression;
- disrupting an academic task;
- talking with peers or teacher about unrelated subjects;
- looking around the classroom and not attending to the academic task;
- non-compliance with teacher directions or commands;
- self-stimulatory behaviour; and
- self abuse.

The following behaviours, as reported by Evans et al. (1995) were also included within the definition of off-task behaviour for this study because they related directly to the behaviours typical of students diagnosed with ADHD:

- any repetitive purposeless motion of limbs or trunk occurring alone;
- any inappropriate vocalisation;
- playing with or touching objects; and
- out of seat behaviour.

In this study a student was considered to be on task or academically engaged if behaviour so defined persisted for at least 30 seconds. Shorter periods of engagement or on-task behaviour were not counted towards the total. Totals of minutes of time on task and academic engaged time were assessed as a percentage of the total period of observation.

A small sample of word-processed field notes based on the narrative description and recorded soon after the relevant observation period of Ricky is included at this point to exemplify how engaged time and time on task were calculated. The notations in the first two columns indicate intervals assessed as time on task (T0T) or academically engaged time (AET). A tick represents a period of approximately ten seconds on task. An explanation of the table follows it.

Table 7.1
Extract of Field Notes Recorded Tuesday, 6 August, 1996.

TOT	AET	Time	Observation notes
-	-	10.02	Teacher instructing chn to get out books as I enter. Ricky out of seat looking at chart on back wall (close to desk) and tracing around picture with finger.
30 s	30 s	10.03	Ricky turns, runs to tray, gets book out; returns to desk, running over chairs on way back. Sits at desk, begins ruling page, waves ruler around before margin drawn; leaves seat; approaches teacher who is busy with another student; approaches b'board and draws on it with finger, runs back to desk; completes margin and writes three word heading and date. ✓✓✓
-	-	10.05	Rubs side of chair; mimics noise it makes; calls to peer opposite, 'Look at this.' Peer tells him to 'Stop it'; Ricky continues rubbing chair.

3 m	3 m	10.07	Ricky stamps feet loudly several times; Teacher says, "Stop that please Ricky.' Ricky complies; moves quickly under table to get eraser which has fallen off table next to him; sits on chair; erases quickly; starts writing.✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓✓
-	-	10.11	Looks up; gazes around, rocks on chair; flicks eraser across table; peer doesn't respond.
1 m	1 m	10.12	Two boys leave table; Ricky calls 'Ms F...'; Teacher approaches, says, "That's not right, Ricky', and assists Ricky for approx. one minute✓✓✓✓✓✓; Teacher leaves; Ricky rocks, gazes.
1m3 0s	1m3 0s	10.14	Ricky leans across table to girl opposite; says, 'I can make a castle'; girl ignores; leaves desk to show teacher work; Ricky alone at table now; writes in book ✓✓✓✓✓✓✓✓✓.
-	-	10.16	Lifts head, calls 'Finished'; stands on chair, jumps off and crawls to front of room where students are sorting out sheets; crawls and slides on floor around them.
-	-	10.18	Goes to board; draws on it with finger; moves back to children on floor; talks briefly to them; they don't respond; Ricky walks to paper tub; rummages around and pulls out sheet of paper; returns to desk.
-	-	10.20	Teacher approaches; marks original book work ✓; Ricky rocks and looks around; Teacher says, 'The spelling words aren't finished. Hurry up, please.' Teacher walks away.
-	-	10.21	Ricky leans over boy next to him and looks at his work; leaves seat; approaches Teacher who is working with another student; says, 'I didn't get to finish that'. Doesn't wait for response; runs back to desk.
-	-	10.22	Sits; moves under table quickly; vocalises strange noises; returns to seat.
-	-	10.23	Writes on worksheet ✓; Teacher approaches; says, 'That's the wrong sheet. Go and get the right one this time, please.' Ricky hops to front of room; takes another sheet from tub; hops back to seat.
30s	30s	10.24	Ricky sits; writes briefly ✓; raises head; vocalises strange noises; writes several words, sounding them out ✓✓✓; T approaches; ticks the word Ricky has written; says, 'Keep going'.
		10.25	Teacher approaches me and talks.
-	-	10.28	Ricky bouncing on chair; leans over and takes coloured pencil from tin; draws on small piece of paper. Teacher approaches; removes piece of paper; puts original sheet in front of him; says, 'Read those words'. Ricky sounds out one ✓; Teacher looks up at noise and moves off.
-	-	10.29	Ricky draws; lifts head; waves arms around and rocks on chair; slides under table; girl opposite says, 'Ricky, stop bumping'.

-	-	10.30	Sits on chair; writes briefly ✓; starts making odd noises; moves erratically on chair, draws; jumps onto chair. Girl opposite says, 'Ricky, shush'. Ricky approaches Teacher and asks to go to toilet. Teacher says, 'One minute'. Ricky runs out of room.
-	-	10.33	Ricky returns, sits heavily on chair, asks a question of peers at table but keeps talking; swings legs, one shoe comes off, Ricky laughs; puts shoe on again.
-	-	10.34	Teacher calls all students to sit at front of room; Ricky runs to front; kneels and bounces around on knees, says something to teacher, teacher doesn't respond; Ricky lightly headbuts leg of boy standing next to him.
-	-	10.35	Teacher tells everyone to sit down as she opens a book. Ricky still bouncing on knees at front of group.

Table 7.1 demonstrates how both time on task and academic engaged time were calculated. When timed observation intervals were of several minutes duration and both on- and off-task behaviours were recorded, some assessment had to be made of how much time the off-task behaviours would take. For example, between 10.07 and 10.11, although the student stamped his feet, moved under the table, erased something, and lifted his head spasmodically, he was considered to be on task for most of that period, as each of those actions took little time. One of the shorthand methods used by the researcher was to record a tick whenever the target student was on task for approximately ten seconds. This time period had nineteen ticks which was translated into an on-task time of three minutes. On those occasions (for example 10.20, 10.23) when only one tick appeared, the criterion of thirty seconds on task was not met and so this period was not counted towards engaged or on-task time.

At 10.25, the teacher approached the researcher and commented on how easy it was to tell when Ricky was due for another tablet, and this led to a few minutes conversation about Ricky's response to medication. Recording of behaviour was not continued during that period, therefore those three minutes were deducted when assessing TOT and AET.

At 10.34 when the teacher called everyone to the front of the room Ricky complied, but because his manner of getting there and his behaviour once there were inappropriate and interfered with peers his behaviour was not assessed as being on task. In this extract, based on the decisions explained above, the student scored 20% for both time on task and AET: that is, six of the thirty minutes.

Having established time on task and academic engaged time percentages for all observation periods, averages could be calculated for each student which provided broad but useful comparative data.

7.2 ANALYSIS OF CLASSROOM ECOLOGY

In order to investigate in some systematic way those elements of the classroom ecology that were affecting time on task and academic engaged time, both time on task and academic engaged time were viewed in relation to a range of different classroom factors. Consistent with Bronfenbrenner's (1979) view that all aspects of the environment and the interactions among them were important in understanding behaviour which occurred within that setting, analysis of the data was as comprehensive as possible. This involved examining the following aspects of the classroom ecology:

- context variables, such as day of the week and time of each observation period;
- the nature of the task, the task-student match, and level of task demand;
- specific target student behaviours, including those directly related to the diagnosis of ADHD;
- peer behaviour in relation to the student with ADHD;
- teacher behaviour in terms of
  - organisation of the physical environment;
  - management practices; and
  - instructional practices.

7.2.1 Coding of the Data

Field notes were read and reread many times as interactions and events were coded into different categories. The categories changed, in some cases many times, before the final categories described in this section were finalised. In some cases the coding resulted in a frequency count, as was the case with the number of times the target students approached their teachers. In other cases, interactions or events were allocated to categories such as *evidence of attention problems*, *use of routines by teacher*, *maintenance of momentum*, and a variety of other categories (which have been detailed in the proceeding section) and given an overall rating of high, moderate or low.

Once each observation period was coded, information for each student was collated using Excel spreadsheets. The spreadsheets were organised so that levels of time on task and academic engaged time could be evaluated in relation to each of the classroom elements listed. In some contexts within a qualitative paradigm such procedures as frequency counts (more often found in quantitative data) can provide useful information. Miles and Huberman (1994, p. 42) refer to this as the *"quantizing level"* of qualitative-quantitative linkage. The fact, for example, that within a 40 minute observation period Mitchell was involved in six negative interactions with peers (see Table 7.4) provided considerable insight into interactions within the classroom throughout that time.

The summary information on the Excel spreadsheets provided a snapshot of each student's interactions in the classroom and facilitated closer analysis. Some clear patterns emerged regarding those conditions which were associated with higher levels of time on task and academic engaged time and set the scene for more precise data analysis.

7.2.2 Analysis of the Context Variables

The accumulating data were more easily managed once each observation period was coded according to context variables. This then was the initial coding task. Codes and decision rules used for this section of the data recording were as follows:

Ob No.		observation number
D/T		day (using conventional abbreviations) and time of observation, which was recorded as:
	m	if the observation took place during the first period of the day, usually between 9.00 and 11.00 am;
	mm	if the observation took place in the middle section of the day, between the morning break and lunch; and
	aft	if the observation took place after lunch
LC		lesson content – a brief description was noted
M/O		minutes of observation
TM		task match, which was judged on level of engagement of student and rated as:
	low	if task did not match interest and/or ability level of student ;
	med	indicating medium match with student interest and/or ability; or
	high	if task was judged to match interest and ability level of student to a high degree.
TD		task demand, which was rated as:
	low	if it involved free choice activity, highly routine procedures or was highly motivating;
	med	indicating medium demand if the task involved strong teacher direction; or tasks such as choral responding, discussing relevant material with peers or manipulating concrete materials; or
	high	if it involved such activities as oral reading, answering oral or written comprehension; or doing mathematical calculations.

When TOT and AET percentages were added to the table, any broad relationships between TOT, AET and context variables could be noted. It was important to determine if there was a pattern of reduced engagement or on-task behaviour on certain days of the week, throughout certain periods of the day, during particular lesson types or with

tasks of lesser or greater demand. The level of task demand was important as maintaining engagement throughout a highly demanding task is significant for much academic learning. The number of minutes of each observation was also included in this initial analysis because a high percentage of engaged time over a fifteen minute period of observation would not be as significant as a similar level over, for example, a 40 minute period.

Understanding what facilitates engagement in high demand tasks is important when developing a model of effective teaching for students with ADHD. To illustrate how this was done, the context data summary of the first ten observation periods of one of the target Kindergarten students, Kyle, has been presented in Table 7.2.

Table 7.2 reveals, for example, that during Observation 5, Kyle was calculated as having an average TOT of 65% and AET of 30% over a 55 minute observation period on a high demand number task on a Wednesday morning. It was possible to establish averages for different periods of the day and for different lesson types. This provided a broad overview of the classroom behaviour of each student and a starting point for further analysis. As various aspects of the classroom ecology were analysed, they were added to the table. This allowed the analysis of different elements to take place with some understanding of the context of each observation period, and an awareness of task match and task demand as these were key points of analysis. Having observation periods and context columns numbered also facilitated discussion of specific interactions.

Table 7.2

Task Characteristics in Relation to Time on Task and Academic Engaged Time for Kyle – extract

1 Ob No.	2 D/T	3 LC	4 M/O	5 TM	6 TD	7 TOT	8 AET
1	Thurs m	craft	20	low	low	40%	0%
2	Fri m	Junior assembly	20	low	low	55%	n/a
3	Mon mm	learning of poem	20	med	med	45%	0%
4	Mon mm	number-practical activities	15	high	med	47%	20%
5	Wed m	number-worksheet	55	high	high	65%	30%
6	Tues m	language worksheet	25	high	high	56%	44%
7	Tues mm	fitness activities	20	med	low	0%	n/a
8	Fri m	sports preparation	50	med	low	10%	n/a
9	Friday	Sports day	180	med	varied	?	n/a
10	Tues m	morn'g routine;shared read'g	30	high	med	47%	0%

Key

Ob no.	observation number	TD	task demand
D/T	day and time of observation	TOT	time on task
LC	lesson content	AET	academic engaged time
M/O	minutes of observation	?	data unavailable or not recorded
TM	task match		

7.2.3 Analysis of specific ADHD student behaviours in relation to time on task, academic engaged time, lesson content and task demand

Examination of more specific factors relating to the students with ADHD was then possible. This was done in order to take into account the individual elements within the microsystem of the classroom. The behaviour of individual target students was examined in terms of typical ADHD behaviours exhibited, the number of times they approached their teacher and peers, the number of times they interfered with their peers, and the number of times they imitated peer behaviour. Each of these factors emerged from the data as appearing to have an effect on academic engaged time and time on task. Other behaviours which appeared to be of relevance to individual target students were also examined. Codes and decision rules used throughout this aspect of the data analysis were as follows:

ATT		level of *attention* problems displayed, rated as either
	low	if minimal problems were displayed;
	mod	signifying moderate levels if behaviours such as gazing around or moving off task persisted for up to half of the observation period; or
	high	if behaviours such as those above persisted for more than half the observation period.
IMP		level of *impulsivity* displayed, rated as either
	low	if minimal impulsive behaviours were displayed;
	mod	signifying moderate if behaviours such as interrupting, calling out answers, or suddenly taking another's belongings consistently occurred for up to half of the observation period; or
	high	if behaviours such as those above consistently occurred for more than half the observation period.
HYP		level of *hyperactivity* displayed, rated as either
	low	if few hyperactive behaviours were noted;
	mod	signifying moderate, if out-of-seat behaviour, excessive talking or fidgeting, or inappropriate running or climbing persisted for up to half of the observation period; or
	high	if behaviours such as those above persisted for more than half the observation period.
AT		number of times target student approached the teacher
IIP		number of times target student initiated positive interaction with a peer
IP		number of times target student interfered with a peer
ImP		number of times target student was observed imitating peer behaviour

An example of how this was displayed for one observation period of Kyle is provided in Table 7.3.

Table 7.3 reveals that during Observation 5, a high demand number lesson, moderate levels of attention difficulties, impulsivity and hyperactivity were noted. Kyle approached his teacher three times, initiated positive interaction with his peers once and was assessed as interfering with his peers on one occasion. No imitating of peer behaviour was observed throughout that period. A clearer picture of Kyle's behaviour within the classroom microsystem for that period of observation thus emerged. Once all observation periods were coded according to the variables relating to the target student's behaviour, patterns and relationships between these points of analysis were more easily detected.

Table 7.3

Target Student (Kyle) Behaviour in Relation to Time on Task and Academic Engaged Time

1	2	3	4	5	6	7	8	9	10	11	12
Ob No.	LC	TD	TOT	AET	ATT	IMP	HYP	AT	IIP	IP	ImP
5	number	high	65%	30%	mod	mod	mod	3	1	1	0

Key

LC	lesson content	HYP	hyperactivity evident
TD	task demand	AT	number of times target student approached teacher
TOT	time on task		
AET	academic engaged time	IIP	initiated positive interaction with peer
ATT	attention difficulties	IP	interfered with peer
IMP	impulsivity evident	ImP	imitated peer behaviour

Having coded the target student behaviour within the classroom, other aspects of the classroom ecology were examined in order to formulate as comprehensive a view as possible of the classroom experiences of these students. Lesson content and task demand were again included in all tables to facilitate the analytic process as successive tables were viewed.

7.2.4 Analysis of peer behaviour in relation to target student behaviour, lesson content, task demand, academic engaged time and time on task

Peers form an integral part of an individual's classroom environment, thus peer behaviour in relation to the target students was examined. Measures of the number of times the target students initiated positive interactions with their peers and the number of times each target student directly interfered with peers were again included in the tables as those factors could have had a direct bearing on peer responses. In this way, relationships between peers in the classroom microsystem were analysed. Only one new coded item was added to the table to include this information:

NP	number of time target student received a negative response from a peer.

The data from one observation period of Mitchell is provided in Table 7.4 to demonstrate how this was done. Table 7.4 reveals that during Observation 2, a high demand editing task in which Mitchell was on task only 7% of the time, he interfered with his peers on six occasions and received a negative response on six occasions. This provides a useful overview of how Mitchell and his peers interacted on that occasion.

Table 7.4
Peer Behaviour toward Mitchell in Relation to Time on Task and Academic Engaged Time – extract

1	2	3	4	5	6	7	8	9
Ob No.	**D/T**	**LC**	**TD**	**TOT**	**AET**	**IIP**	**IP**	**NP**
2	Thurs mm	editing	high	7%	7%	0	6	6

Key

D/T	day/time	AET	academic engaged time
LC	lesson content	IIP	initiated positive interaction with peer
TD	task demand	IP	interfered with peer
TOT	time on task	NP	received negative response from peer

7.2.5 Analysis of factors under the teacher's control

Having considered the impact of the individual students and their immediate relationships with peers, the classroom ecology was then analysed in terms of factors which were under the teacher's control. This acknowledged further aspects of the microsystem in which the students were placed, such as the organisation of the physical environment, the classroom management behaviour of the teacher, and the instructional procedures used by the teachers. The organisation of the physical environment was the first considered.

7.2.5.i Analysis of the organisation of the physical environment

By presenting information regarding the organisation of the physical learning environment in relation to AET and TOT, any relationships between the physical environment and TOT and AET were more easily identifiable. Elements within the category of physical environment which were considered were the formality of each learning setting and evidence of planned seating for the target student. Both of these factors appeared to be of significance for some students. Codes and decision rules used for this aspect of the data analysis were as follows:

FS	the formality of the classroom setting, rated as either low, mod(erate) or high, depending upon desk arrangements, the organisation of resources, the level of classroom decoration, and the degree of freedom of movement afforded the students.
PS	evidence of planned seating for the target student, rated as either high, mod(erate) or low, depending upon whether student was placed near the front, away from obvious distractors, or near on-task peers.

An example of the data display for Mitchell in relation to this aspect of the analysis has been included as Table 7.5. Table 7.5 reveals that during the editing lesson, the formality of the room organisation was assessed as low. This rating was based on the fact that desks were arranged in various clusters as designed by the students, resources were loosely distributed around the room, student work was displayed in an informal fashion, and students had freedom of movement around the room. Planned seating was also given a rating of low as Mitchell had free choice in this regard.

Table 7.5

Organisation of the Physical Environment in Relation to Time on Task and Academic Engaged Time for Mitchell – extract

1	2	3	4	5	6	7	8
Ob No.	**D/T**	**LC**	**TD**	**TOT**	**AET**	**FS**	**PS**
2	Thurs mm	editing	high	7%	7%	low	low

Key

D/T	day/time	AET	academic engaged time
LC	lesson content	FS	formality of setting
TD	task demand	PS	evidence of planned seating
TOT	time on task		

7.2.5.ii Analysis of the managing behaviours of teachers

The second factor under the teacher's control which was examined in relation to time on task and academic engaged time was the managing behaviour of the teacher. This element of analysis related to how the teacher managed the behaviour of the class and the conduct of the lessons. The level of classroom monitoring demonstrated by the teacher was rated as either low, moderate or high. The number of times the teacher redirected the target student to task was recorded for each observation period. Evidence of direct and explicit language, the number of times the teacher engaged in positive interactions with the target student, and evidence of the use of routines was also recorded as part of teacher managing behaviour. Codes and decision rules used for this aspect of the data analysis were as follows:

MB		general monitoring behaviour (that is, of whole class, not just of target student), rated as either
	low	if, for example, the teacher was absent from room or seated at the desk engaged in some organisational activity throughout seatwork for a large proportion of the lesson;
	mod	signifying moderate levels of monitoring if, for example, the teacher engaged in limited movement around the room; or
	high	if the teacher moved persistently around the classroom attending to student enquiries and/or monitoring behaviour.
TR		the number of times the teacher redirected the target student to task;
DL		the teacher's use of direct and explicit language, rated as either low, moderate or high;
PI		the number of positive interactions between target student and teacher;
R		evidence of the use of routines, rated as either low, moderate or high.

An example taken from Eric's data display is presented as Table 7.6. This Table reveals that during Observation 1, a high demand mathematics lesson, the teacher's monitoring behaviour was regarded as moderately high; he did not redirect Eric on any occasion; the teacher's use of language was assessed as highly explicit and direct; routines were very much in evidence; and there were two positive interactions between the teacher and Eric. This provides part of the picture of how Eric and the teacher were interacting within the classroom learning environment on that occasion. Data extracts which exemplify how decisions regarding the use of language and evidence of routines were made have been provided in the Findings chapters (Eight to Twelve) of this thesis.

Table 7.6

Managing Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Eric – extract

1	2	3	4	5	6	7	8	9	10	11
ObNo	D/T	LC	TD	TOT	AET	MB	TR	DL	PI	R
1	Wed aft	maths	high	89%	60%	mod	0	high	2	high

Key

D/T	day/time	MB	monitoring behaviour
LC	lesson content	TR	teacher redirects to target student
TD	task demand	DL	use of direct, explicit language
TOT	time on task	PI	positive interactions
AET	academic engaged time	R	use of routines

7.2.5.iii Analysis of the instructional behaviour of teachers

The final aspect of teacher behaviour which was examined related to the instructional behaviour of the teacher. In some cases, the analysis referred to instructional behaviour directed towards the target student only, whereas other aspects referred to whole class instructional behaviour. Within this category, the use of explicit demonstrations, the level of task structuring, the number of times the teacher approached or assisted the target student, the level of momentum maintained throughout the lesson, and the frequency and type of feedback were recorded to facilitate the analytic process. Codes and decision rules used throughout this aspect of the data analysis were as follows:

Dem	presence of teacher demonstration, rated from low indicating a brief and/or less explicit demonstration to high indicating a detailed and structured demonstration;
TS	task setting, rated from low indicating minimal direction to high indicating highly structured and explicit task setting;
TAA	the number of times the teacher approached or assisted the target student;
MM	maintenance of momentum, with low referring to a lesson which featured, for example, many interruptions, loss of time as equipment was organised, and frequent redirections to task, through to high for a lesson which involved, for example, high task-related student interaction, smooth transition from one part of the lesson to the next and high rate of completion of set tasks;
FF	frequency of feedback related to academic tasks, as opposed to feedback on behaviour, rated as either low, mod(erate) or high; and
PF	use of process or elaborated feedback on academic tasks, rated as either low, mod(erate) or high.

Eric's first observation period is presented again as Table 7.7 with factors relating to his teacher's instructional behaviour. Table 7.7 reveals that as part of that same mathematics lesson, the teacher provided a highly explicit demonstration; the task setting was rated as being highly structured; the teacher approached and/or assisted Eric on four occasions; the momentum of the lesson was assessed as being high; and feedback to the class in general was frequent and highly process oriented. This builds up an even clearer picture of how the teacher was interacting with the classroom learning environment throughout that lesson.

Table 7.7

Instructional Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Eric – extract

1	2	3	4	5	6	7	8	9	10	11	12
Ob No	D/T	LC	TD	TOT	AET	Dem	TS	TAA	MM	FF	PF
1	Wed aft	maths	high	89%	60%	high	high	4	high	high	high

Key

D/T	day/time	TS	level of task setting
LC	lesson content	TAA	no of times teacher approached or assisted target student
TD	task demand		
TOT	time on task	MM	maintenance of momentum
AET	academic engaged time	FF	frequency of academic feedback
Dem	level of demonstration	PF	level of process feedback

Each of the categories discussed above focused on different aspects of the ecology of the classroom and emerged from the data as of significance to the target students' TOT and AET. Bronfenbrenner (1979) reminds us that understanding individual behaviour must go beyond examining the individual. Factors in the immediate and surrounding systems and the relationships between them must also be examined. Analysis of the observational data addressed many different aspects of the classroom environment in order to identify those elements which were associated with high levels of TOT and AET.

7.2.6 Analysis of Interview Data

Interview data from principals, parents, teachers and students were examined for patterns and themes which would extend understanding of the classroom behaviour of students with ADHD.

Analysis of the data from the principals' interviews provided demographic and background information which increased understanding of the microsystem of the school and of the relationships between the individual classrooms and the school. For example, the extent to which effective classroom systems (in that they facilitated high

levels of time on task and academic engaged time) were supported by broader school-wide systems in one particular case was evident through analysis of this data. The way in which, on some occasions at least, there was an attempt made to match teachers with students also emerged from this interview data.

Data from interviews with the parents provided information which assisted the understanding of another aspect of Bronfenbrenner's (1979) mesosystem: the relationship between the classroom and the home environments. For example, consistencies between management strategies used in both environments and evidence of strong and positive relationships between the two environments were relatively easy to identify in some cases and supported Bronfenbrenner's hypotheses that individual development is enhanced by these factors.

The data from teacher interviews revealed many of the teachers' beliefs concerning ADHD. Analysis of these data demonstrated the power of teacher beliefs in directing organisational, management and instructional behaviour in the classroom. These data, by way of triangulation across methods, provided confirming evidence of much of what was found in the classrooms. One teacher's expressed belief that students learned best when they had control over their learning environment, freedom to move around as they wished and when surrounded by familiar items things that made them feel comfortable and "at home" (teacher interview, 9/12/96) confirmed observation notes regarding management practices in her classroom.

The brief, informal interviews with the students also provided confirming data for classroom observations. In one instance a teacher, on noticing that one of the target students was off task, said, *"I'm watching you, Toby"* (25/9/96). Toby looked at her for a moment and then responded with a small, tentative wave. When asked later by the researcher why he had done this, he replied, *"She was being nice to me, so I waved"* (25/9/96). The implication of what the teacher was saying – presumably, "I can see

you're not working and I want you to get on with it" – was apparently not understood by Toby, who merely thought the teacher was engaging in some pleasantry. This confirmed the developing proposition regarding the importance of using direct and explicit language when communicating with students with ADHD.

7.2.7 Analysis of work samples

Work samples provided evidence of the fact that the students with ADHD generally completed far less work than their peers. Triangulation of the observational data through analysis of work samples further supported the developing thesis that this is a major area of concern for these students. Examination of Eric's work also supported the developing proposition that he appeared to match, if not outdo, the work output of his peers in both quality and quantity. This appeared to relate to the fact that more of the activities within Eric's classroom presented as what Bronfenbrenner (1979) referred to as *molar* activities: those that engaged the interest of the student and motivated him or her to resist distractions and complete the task.

7.3 CHECKS FOR RELIABILITY AND VALIDITY

Criticisms of qualitative approaches have centred on their lack of objectivity, rigour and scientific control. Lincoln and Guba (1985) argue that within the qualitative research mode the notions of credibility, applicability (or transferability), consistency and neutrality may be seen as analogies respectively for internal validity, external validity, reliability and objectivity.

Building on these notions, Guba and Lincoln (1988, p. 84) proposed the following techniques to address the issues of reliability and validity in naturalistic enquiries. The attempts made to incorporate each of these checks into the research process reported here are described after each point.

7.3.1 Prolonged engagement at the site

This, according to Guba and Lincoln (1988, p. 84), provides time to understand salient characteristics and to overcome biases and misconceptions. Qualitative researchers need to continually question and re-evaluate their findings. The process of continual data analysis while the investigator spends long periods of time with the participants increases the ability to refine constructs and to match them with reality.

In this research the data collection period extended over one school year, with four days per week being spent in schools for the last two terms. A total of 361 observation periods, ranging from 10 to 90 minutes, was spent observing in classrooms, including 291 periods of timed observations. An additional 61 hours was spent interviewing participants in formal situations. Many more hours were spent in informal information gathering sessions at the end of observation periods.

7.3.2 Persistent observation

This is required to confirm categories and to appreciate atypical but meaningful characteristics.

The observation schedules in this research were designed to observe students over all weekdays and over all periods of the day. Each student was also observed on different occasions in the playground and participating in a range of events which occur throughout a typical school year. Representative events included market days, school athletic days, Book Week activities, assemblies, sports sessions, multicultural days, school fetes, excursions and listening to school visitors such as illustrators, actors and artists.

7.3.3 Peer debriefing

This is seen by Guba and Lincoln (1988) as essential to test growing insights and receive counsel about the evolving design, to discharge personal feelings and to leave an audit trail.

Regular meetings with supervisors and other experienced qualitative researchers were conducted throughout this research. This was particularly helpful when selecting the classrooms for closer observation at Site Two and when some of the ethical issues discussed in Chapter Six arose. Throughout the data collection period preliminary material was also presented at conferences in order to gain further insights from other qualitative researchers.

Miles and Huberman (1994) also warn against typical sources of error in qualitative research. They propose the following ways in which errors relating to validity and reliability can be guarded against. Attempts made to address these sources of error in the current research are once again discussed following each point.

7.3.4 Ensuring representativeness

This may involve searching for contrasting cases, sorting cases systematically, sampling randomly and increasing the number of cases being studied.

In this research, the inclusion of older students helped establish whether or not certain behaviours, preferences, and so on of students diagnosed with ADHD were consistent across age groups. The instrumentation used for the diagnosis of ADHD was confirmed in all but one case to ensure that the identification of these students was valid. Contrasting cases such as Eric were not excluded but included in an attempt to expand understanding of the condition through examination of an atypical student.

Observations were planned to take place on all days of the school week, and across all periods throughout the day for an extended period of time.

7.3.5 Checking for researcher effects

The very presence of the researcher can have an impact on the environment being studied. Researchers are obliged to acknowledge these effects and to counter them as far as possible.

In this research, when selecting classrooms for more systematic analysis, two classrooms were not selected because of the likely researcher effects. In one case, the classroom teacher was clearly very uncomfortable having a researcher in the room during the preliminary classroom visits, a factor which would probably affect the validity of the data collected. In another case, the researcher withdrew from one classroom because of the presence of a severely behaviour-disordered student. It was felt that adding another variable to an already highly stressful setting would not be in the best interests of that student, his peers or his teacher.

In another case, the class teacher appeared at times to be uncomfortable with the observation process even after some months of observation and despite her expressed interest and willing co-operation in the research. This usually occurred when the target student was being particularly challenging. In response to this, offers were made by the researcher to teach the class for some periods of time, giving the teacher an opportunity to observe the researcher in a teaching role and thus equalising the relationship to some extent. The researcher asked the teacher to record observations of the target student throughout this process. In effect, teacher and researcher briefly exchanged roles. It eventuated that the researcher also had difficulties keeping the target student on task, a fact which contributed to significant "bonding" between researcher and teacher. This did appear to contribute to greater comfort levels throughout later

observation periods (and reminded the researcher of the difficulties of keeping these students on task).

7.3.6 Triangulation of the data

Gathering data from as many sources as possible enables the qualitative researcher to confirm data or, alternatively, question its validity.

As previously described, triangulation occurred in this research by cross-checking classroom observational data through the collection of work samples and member checking with participants after observation periods and interviews.

7.3.7 Making contrasts and comparisons

Making comparisons or drawing contrasts between students, activities, interactions and so on can be useful in isolating important elements or in supporting generalisations.

Data relating to Ricky were helpful in this regard. As the result of his placement in a class shared by two teachers and his inclusion in an Intensive Reading class for the morning period over twelve weeks which was also taught by two different teachers, it was possible to observe Ricky interacting with four different teachers. This enabled useful comparisons to be made of his behaviour in these four settings and to further investigate the role of the teacher in the learning environment.

The different age groups represented in the sample enabled comparisons of behaviour to be made. The inclusion of four Kindergarten students at two different sites also enabled comparisons to be made across that age group.

7.3.8 Examination of outlier cases

It is important not to exclude discrepant or exceptional cases that do not follow the usual patterns.

> Going deliberately after negative and atypical instances is...healthy in itself: it may force you to clarify your concepts, and it may tell you indeed that you have sampled too narrowly. (Miles & Huberman, 1994, p. 34)

Eric was included as a major focus student as his observed behaviour in the classroom was not at all typical of a student diagnosed with ADHD, and thus he presented as an outlier. Eric's inclusion in the study contributed much to the development of the model of effective teaching practice for students with ADHD, precisely because his behaviour was so different from that of the other target students.

7.3.9 Replication of the findings

Looking at multiple cases is considered to be an even *"stiffer test"* (Miles & Huberman, 1994, p. 273) than triangulation. Findings which can be reproduced in another setting or another context can be reported with greater confidence.

The use of two different sites and ten different children increased the generalisability of this research, especially in those areas where highly consistent patterns were noted across all case studies.

7.3.10 Seeking feedback from respondents

This is seen to be one of the most logical sources of corroboration.

> An alert and observant actor in the setting is bound to know more than the researcher ever will about the realities under investigation. (Miles & Huberman, 1994, p. 275)

Bronfenbrenner himself (1976, p, 161) referred to feedback from informants as a source of *"phenomenological validity"*.

In this study, notes taken at interviews were read back for confirmation at the conclusion of each interview so that interviewees could check for accuracy, and elaborate or disclaim if necessary. The views of teachers and students were sought as often as possible after classroom observations in order to gain their perspective on events and interactions which had been recorded.

Thus, consistent efforts were made throughout the data collection period to avoid errors typical of qualitative research and to increase the validity and the reliability of the findings.

7.4 CHAPTER SUMMARY

This chapter has presented in detail the data analysis procedures. The calculation of academic engaged time and time on task, the way in which the classroom observational data were analysed and displayed, and the use of interview data and work samples for support and triangulation have been recorded in order to fulfil the researcher's responsibility to make clear how data were analysed and the basis on which conclusions were drawn.

An ecological study demands that elements from all layers of the environment be examined if a full explanation of behaviour is to be gained. This study has only been able to examine some of those elements, chiefly within the microsystem of the classroom, but also to some extent the way in which elements from the classroom have interacted with the microsystem of the family. The wealth of data gained from this study alone reveals the explanatory potential of a more broadly based ecological study.

Despite its limitations, this study has been grounded in the natural learning environment of students with ADHD. Prolonged periods of time were spent in the classrooms, detailed records were taken of classroom events, observational records were checked with the participants and work samples were collected to support classroom observations. Data were analysed continually and developing propositions checked by returning to the classroom for confirmation, refinement or rejection. This was done in order to develop a model, of effective teaching for students diagnosed with ADHD.

The following chapters present detailed results relating to five of the ten target students described in Chapter Five. Some reduction of the data presented in this thesis had to take place due to space limitations. Bonnie was excluded from the results section as it was the opinion of different stakeholders that other conditions were affecting Bonnie's behaviour and that ADHD was probably not her primary diagnosis. Detailed data on Bailey was not included as he was not formally diagnosed. Data gathered on Mark, Paul and Toby, who were in the same class as Mitchell, have not been included. There were greatly reduced data collected on these students due to the difficulty of simultaneously recording data on four students in one classroom: the focus was always on Mitchell due to the great impact he had on that classroom environment. Detailed data have been presented on Kyle, James, Ricky, Mitchell and Eric in the formation of a grounded theory of best classroom practice for students with ADHD. Chapter Eight will present detailed findings relating to the first of the target students, Kyle.

CHAPTER EIGHT

FINDINGS RELATED TO KYLE

In this and the following four chapters, findings related to the five students selected for detailed discussion are presented as separate case studies. These findings have been drawn from classroom observations and have been supported by teacher, parent and pupil interviews. Reference to work samples is also used to illustrate particular points.

Each of these chapters follows the same format as described below:

- Initially, brief background information on the target child gained from interviews with the student's parents, teachers and in some cases from formal assessments, has been provided to place the subsequent results in an appropriate context. Information relating to the relationships between home and school is also provided in this section.

- A short conceptual summary of the individual case-oriented data contained within the chapter follows. This is designed to highlight the particular significance and relevance of each particular child's story to the research questions addressed in this study.

- Detailed data gained from the classroom observations of the target student are then presented in a series of tables. These address the main elements of the classroom ecology (as detailed in the next dot points) which emerged from this study as being significant for the maintenance of high levels of time on task and academic engaged time for each individual student.

- The first table in each chapter relates percentages of time on task and academic engaged time to the day and time of week, lesson content, task match and task

demand of each observation. This provides an overall picture of each observation period and of how each target student responded throughout certain lessons and during certain periods of the day.

- The proceeding tables relate percentages of time on task and academic engaged time to one of the following aspects of the classroom ecology:
  - **task characteristics**, including task match and task demand;
  - **target student factors**, including evidence of ADHD characteristics, and interactions with teacher and peers;
  - **peer behaviour** in terms of how often they engaged in negative interactions with the target student;
  - **organisation of the physical environment**;
  - **teacher managing behaviour**, including monitoring behaviour, teacher redirects, use of explicit language, positive interactions with target student and use of routines; and
  - **teacher instructional behaviour**, including use of demonstrations and structured task setting, direct teacher assistance of the target student, maintenance of momentum, and frequency and type of feedback used.

- As the different classroom relationships were explored, *particular attention was paid to those observation periods when average percentages of time on task and academic engaged time were above 70%.* These observation periods have been shaded in all tables to highlight the elements which were associated with them within each category.

- Lesson content and task demand have also been included in each table to facilitate analysis. An awareness of those elements of the classroom environment which were in evidence when time on task and academic engaged

time were high assisted the development of a model of effective classroom practice for students with ADHD.

In this chapter, findings in relation to Kyle, a Kindergarten student from Site One, are presented.

8.1 BACKGROUND INFORMATION ON KYLE

8.1.1 Early development

Kyle was described by his parents as a placid baby. Early physical milestones were within the normal range. Once he was mobile his hyperactive and impulsive behaviour was noted. He regularly jumped off beds, threw toys, emptied drawers and engaged in potentially dangerous activities.

When Kyle was two he was referred to a paediatrician for asthma, eczema, and suspected hearing difficulties. His hyperactivity, noted at the time by the paediatrician, increased dramatically when he was placed on Ventolin for asthma but he adapted to this medication over a period of months. Speech therapy was recommended and undertaken but at three years of age his speech was still incomprehensible to most people.

His speech rapidly improved when he attended preschool. His mother describes the preschool as *"the doorway to his learning"* and believes he *"almost caught up to all the other kids"* during his eighteen months there (all quotes in this section from parent interview, 18/11/96). The preschool teachers expressed concern about Kyle's ability to adapt to the more rigorous expectations of kindergarten and suggested some investigation into his hyperactive behaviour.

8.1.2 Diagnosis of ADHD

A formal diagnosis of ADHD of the combined type was made just prior to Kyle's enrolment in Kindergarten at age 5.2 and Ritalin was prescribed. His parents reported an *"overnight change"*. He was *"just normal"* when on medication, able to watch television and concentrate on games, and was generally more compliant and adaptable but, according to his mother, *"had to be held with a death grip"* to keep him under control when not medicated. For this reason he was also medicated at weekends and throughout holidays. When some of the difficult behaviours returned after a few months a higher dose of Ritalin was tried, however his mother reported that he became *"depressed and it wasn't worth it"*.

8.1.3 Formal assessment and progress at school throughout period of research

When assessed early in his Kindergarten year, Kyle scored within stanine 3, a moderately low score, on the Peabody Picture Vocabulary Test (Dunn & Dunn, 1981), a test of receptive language. The teacher's records revealed that Kyle's sight vocabulary developed at an average rate for a Kindergarten student, particularly during the latter half of the year, but he continued to have significant difficulties with his phonological development. The teacher's records also revealed that his number concepts and both gross and fine motor co-ordination were below average when compared to his peers.

8.1.4 Relationships between home and school

Kyle's parents saw his teacher as *"good with the kids and she can handle Kyle pretty well most of the time"*. They reported that Kyle *"really likes her - he's always telling us 'Mrs H... said this' or 'Mrs H... said that'"*. They also saw the teacher as approachable and helpful: *"She's easy to talk to and the stuff she tells us usually works at home when we try it"*.

Kyle's teacher believed that the home environment was quite chaotic at times which was reflected in Kyle often arriving without his lunch and medication, and the regular loss of reading books and other school materials which were sent home. The teacher had made several suggestions regarding ways in which his parents could help Kyle but felt that the parents lacked organisational skills and an effective support network themselves, which made managing a child like Kyle very difficult. While the relationship between home and school was positive, she did not believe the home environment was able to support many of the strategies she was trying to teach Kyle at school. *"He hasn't got much of a chance really - I'm surprised he copes as well as he does"* (teacher interview, 13/12/96).

8.2 CONCEPTUAL ISSUES HIGHLIGHTED BY FINDINGS RELATED TO KYLE

Aspects of importance which were highlighted by findings related to Kyle are as follows:

- the effect of ADHD-type behaviours on classroom engagement;
- the impact of task demand on engaged behaviour;
- the role of peer models for some students with ADHD;
- the relationship between formal structures and engagement in high-demand tasks;
- the impact of school-wide systems on classroom functioning: in this case, the school communication systems;
- the use of strategy training with young students with ADHD; and
- the relationship between self-talk and engagement in a task.

8.3 TABULATED DATA FROM CLASSROOM OBSERVATIONS

Table 8.1 provides an overview of the 29 classroom observations of Kyle. It shows relationships between TOT, AET, day and time of observation, lesson content, minutes of observation, task match and task demand. On average, Kyle was academically engaged for 29% of the time throughout the timed observation periods. His time on task averaged 38%.

Morning and afternoon observations were then analysed separately. The average time on task for the morning periods was 44% compared to 11% for afternoon observations. This suggests that on task behaviour was more likely to occur before lunch. It was not possible to compare AET percentages as no afternoon lessons were categorised as being "academic". Factors associated with the period of the day, or in Bronfenbrenner's (1979) terms, with some chronological aspect of the microsystem, appeared to be interacting in Kyle's case. He was more likely to be on task in the morning rather than in the afternoons.

8.3.1 Task characteristics, time on task and academic engaged time

Table 8.1 also reveals that most of the observed lessons were of either low or medium demand. Few of the observed lessons were rated as being of high demand for Kindergarten students. Kyle's classroom would not be classified as being *academically focused.* An academic focus is recommended by the ADHD literature as one of the key characteristics of classrooms in which students with this diagnosis are more able to maintain on-task behaviour.

Low demand tasks averaged time on task of 25%, medium demand tasks 43% and high demand tasks 57%. This trend was opposite to that which would be predicted by Krupski (1985), whose research supported the view that students with learning

difficulties were able to remain on task longer with low demand tasks. Kyle maintained greater on-task behaviour when engaged in high demand rather than low demand tasks. On only one occasion did Kyle score high AET on a task of at least medium demand. This was shared reading of a big book (Observation 22).

On two other occasions time on task was 70% or over. During Observation 26 it was 95%. This was during one of the morning routine sessions, when typically the roll would be marked, money collected, lunch orders taken, formal greetings would be exchanged, and some brief language-related exercise, self esteem activity or such would be conducted. Other observations of morning routines or organisational activity (see Observations 18 and 21) did not score as highly. These differences will be explored in the section on teacher instructional behaviour as TOT appeared to relate to the level of momentum maintained throughout the lesson.

Table 8.1

Task Characteristics in Relation to Time on Task and Academic Engaged Time for Kyle

1 Ob No.	2 D/T	3 LC	4 M/O	5 TM	6 TD	7 TOT	8 AET
1	Thurs m	craft	20	low	low	40%	n/a
2	Fri m	Junior assembly	20	low	low	55%	n/a
3	Mon mm	learning of poem	20	med	med	45%	0%
4	Mon mm	number-practical	15	high	med	47%	20%
5	Wed m	number-w'sheet	55	high	high	65%	30%
6	Tues m	language w'sheet	25	high	high	56%	44%
7	Tues mm	fitness activities	20	med	low	0%	n/a
8	Fri m	sports preparation	50	med	low	10%	n/a
9	Friday	Sports day	180	med	varied	?	n/a
10	Tues m	morn'g rtne; sh rd'g	30	high	med	47%	0%
11	Wed m	Word Bingo	20	low	med	15%	10%
12	Wed mm	reading activities	20	med	high	45%	45%
13	Thurs mm	language/number	34	med	high	50%	29%
14	Tues aft	dance practice	30	low	low	15%	n/a
15	Tues aft	lunch	10	high	low	30%	n/a
16	Thurs aft	weaving	30	low	med	?	n/a
17	Mon m	listening activities	40	high	high	70%	55%
18	Fri m	morn'g routine	20	high	med	18%	n/a
19	Fri mm	phonemic activities	30	high	med	40%	40%
20	Fri aft	talent audition	50	low	low	0%	n/a
21	Tues mm	org'n activities	12	med	low	17%	n/a
22	Tues mm	shared big book	15	high	med	75%	70%
23	Wed mm	grp read class book	15	high	med	33%	27%
24	Thurs m	language w'sheet	30	med	med	43%	30%
25	Fri m	sh'd book; w'sheet	55	med	med	49%	15%
26	Mon m	morn'g routine	20	high	low	95%	n/a
27	Mon m	language w'sheet	10	high	med	60%	20%
28	Wed aft	weaving	30	low	low	12%	n/a
29	Thurs aft	organisation/dance	40	low	low	0%	n/a
			total mins = 946			mean = 38%	mean =29%

Key

Ob No.	observation number	TD	task demand
D/T	day and time	TOT	time on task
LC	lesson content	AET	academic engaged time
M/O	minutes of observation	?	data unavailable or not recorded
TM	task match		

8.3.2 Target student (Kyle) behaviour in relation to time on task and academic engaged time

Table 8.2 presents time on task and academic engaged time measures in relation to Kyle's own behaviour. This reveals the extent to which his individual behaviour contributed to the ecology of the classroom.

8.3.2.i Evidence of ADHD characteristics in relation to time on task and academic engaged time

Kyle was recorded as having attention, impulsivity and hyperactivity problems to some extent in every observation, with attention problems being the most severe (see Table 8.2, columns 6, 7 and 8). In many ways, Kyle presented as a "typical" student with ADHD of the combined type. Many of his behaviours predisposed him to both learning and social difficulties in the classroom. These behaviours were, however, less severe when he was on task a greater percentage of the time (see Table 8.2, Observations 17, 22 and 26, columns 6, 7 and 8). To some extent, Kyle provided an answer to the first research question: "How do the core characteristics of ADHD impact on learning and behaviour?"

Kyle's behaviour within the classroom was variable. He could be, as his teacher stated, *"relatively normal on a good day and blend in with all the others"* (post observation interview, 15/8/96). More usually he demonstrated the behaviours typical of a child with his diagnosis. He moved rapidly from one activity to another, rarely completed set tasks, lost items, bumped into other students and furniture as he moved quickly around the room, gazed around and fidgeted constantly during mat activities. Occasionally he would stand in the middle of the classroom and make rapid, flapping movements with his arms. He needed to be accompanied for the first two terms when sent to the office to take his medication, or when he left the room to go to the toilet, as he regularly became lost or distracted on the way.

Throughout the one lesson of high AET (Observation 22) attention, impulsivity and hyperactivity problems were not considered to be high, although still in the moderate range. Kyle attended closely during periods when visual aids were being used by the teacher, such as when a big book was being read or a worksheet was being explained with continued reference to the sheet itself.

8.3.2.ii "Approaching teacher" behaviour in relation to time on task and academic engaged time

Table 8.2 also reveals that Kyle did not approach the teacher often for assistance, with many observation periods recording none at all. He did approach the teacher once during the observation (No 22) of high AET on a medium demand task (see column 9).

8.3.2.iii "Initiating positive interaction with peers" in relation to time on task and academic engaged time

Kyle did not initiate contact with his peers during periods of high TOT or AET (see Table 8.2, Observations 17, 22 and 26, column 10). Interaction with his peers occurred most often during seatwork or less structured activity. Occasionally when he sat down beside a peer on the mat he would take the peer's hand and hold it, which usually received a positive response. During the observed lunch period (Observation 15) he chatted comfortably with a number of peers as he moved around to three different groups.

8.3.2.iv "Interfering with peers" in relation to time on task and academic engaged time

Considering Kyle's level of hyperactive and impulsive behaviour, he did not interfere with his peers to a great extent. On those occasions when he interfered three or more times (Observations 8, 11, 20 and 29) he was in a relatively informal situation which was not being directly monitored by the teacher. It is also noteworthy that he scored poorly for both TOT and AET on those occasions. During periods of high TOT and

AET he was not observed interfering with his peers (see Table 8.2, Observations 17, 22 and 26, column 11).

Worthy of mention is the fact that, during the Word Bingo activity (Observation 11), in which Kyle interfered with his peers on several occasions, Kyle was on task only when the teacher was leading the group. (The teacher shared her time throughout this period between the six different language groups.) For most of the activity one of the more capable girls watched Kyle's card for him and placed matching words on it while also playing for herself. When it was Kyle's turn to call the words, she whispered each word in his ear and he called the words out, but he did it in such a manner that it disrupted the game considerably. Peer direction was not sufficient to keep him on task throughout this activity: it required teacher direction.

8.3.2.v "Imitating peer behaviour" in relation to time on task and academic engaged time

When Kyle was unsure what to do he tended to look at what his peers were doing (see Table 8.2, column 12). This is evident from the number of times he imitated his peers. If he noticed peers doing something different, even when he was not particularly seeking assistance, he would often copy their behaviour. For example during Observation 13, when doing a colour, cut and paste language activity, Kyle was observed adding "grass" and "sky" (blue colour at the top and green along the bottom of the picture) after looking at the work of a peer who had done the same thing. On another occasion (Observation 6), when he observed the student opposite blowing on and wiping her paper, having just erased something, he also blew on and wiped his paper, even though he had not erased anything. Imitating peer behaviour did feature in two of the three periods of high TOT.

Table 8.2

Target Student (Kyle) Behaviour in Relation to Time on Task and Academic Engaged Time

1 Ob No.	2 LC	3 TD	4 TOT	5 AET	6 ATT	7 IMP	8 HYP	9 AT	10 IIP	11 IP	12 ImP
1	craft	low	40%	n/a	high	high	high	1	2	1	1
2	Junior assembly	low	55%	n/a	mod	low	low	0	0	2	n/a
3	learning of poem	med	45%	0%	high	mod	low	0	0	2	1
4	number-practical	med	47%	20%	high	mod	mod	0	0	0	0
5	number-worksheet	high	65%	30%	mod	mod	mod	3	1	1	0
6	language w'sheet	high	56%	44%	high	low	low	4	2	1	3
7	fitness activities	low	0%	n/a	high	mod	mod	0	0	3	0
8	sports preparation	low	10%	n/a	high	mod	mod	0	1	5	1
9	Sports day	varied	?	n/a	?	?	?	?	?	?	0
10	morn'g rtne; sh rd'g	med	47%	0%	high	low	low	0	0	2	0
11	Word Bingo	med	15%	10%	high	mod	mod	0	0	3	2
12	reading activities	high	45%	45%	high	mod	high	0	0	0	1
13	language/number	high	50%	29%	high	high	high	0	0	0	2
14	dance practice	low	15%	n/a	high	mod	high	0	0	0	2
15	lunch	low	30%	n/a	mod	high	mod	0	*	0	0
16	weaving	med	?	n/a	high	high	mod	3	?	2	0
17	listening activities	high	70%	55%	mod	low	low	1	0	0	5
18	morning routine	med	18%	0%	high	high	high	0	0	0	0
19	phonemic activities	med	40%	40%	low	low	low	0	0	0	1
20	talent audition	low	0%	n/a	high	high	high	1	0	4	0
21	org'n activities	low	17%	n/a	high	high	mod	2	0	2	0
22	shared big book	med	75%	70%	mod	mod	mod	1	0	0	1
23	grp read class book	med	33%	27%	mod	mod	low	0	0	0	2
24	language worksheet	med	43%	30%	mod	low	high	2	0	0	1
25	sh'd book; w'sheet	med	49%	15%	high	mod	high	1	*	0	3
26	morning routine	low	95%	n/a	low	low	low	0	0	1	0
27	language worksheet	med	60%	20%	mod	mod	low	0	2	1	3
28	weaving	low	12%	n/a	high	mod	high	?	?	?	2
29	organisation/dance	low	0%	n/a	high	high	high	0	0	4	3
			mean = 38%	mean = 29%							

Key

LC	lesson content	AT	approached teacher
TD	task demand	IIP	initiated positive interaction with peer
TOT	time on task	IP	interfered with peer
AET	academic engaged time	ImP	imitated peer behaviour
ATT	attention difficulties	?	data unavailable or not recorded
IMP	impulsivity evident	*	talked often with peers
HYP	hyperactivity evident		

8.3.2.vi Additional behaviours occurring with time on task and academic engaged time

Kyle was occasionally observed engaging in self-talk. Reference to the raw data revealed that this behaviour was often associated with higher levels of on-task time and academically engaged time, although not always. When audible, the self-talk was usually task-related. For example, in Observation 6, when copying the word "lamb" from the blackboard, he quietly said, *"l-a-m-d; no, b - gotta put b on the end"*. Apart from the fact that he confused *i* and *l*, the self-talk appeared to assist him remain focused on the task. During a listening task (Observation 17) during which he scored 70% time-on-task, Kyle regularly chanted statements such as: *"I'm ready, ready, ready" and "No, no, no, not that one"* in a quiet voice as he completed the worksheet according to oral instructions.

8.3.3 Peer behaviour in relation to time on task and academic engaged time for Kyle

Table 8.3 reveals that throughout only seven of the 29 observations were negative responses directed towards Kyle by his peers and on most occasions these occurred only once. Usually these were prompted by his pushing into a line or continuing to touch someone during mat activities. He took the occasional rebuff or sign of irritation with good humour. These incidents were always short-lived and never escalated into a major problem. They did not occur at all during periods of high TOT and AET (see Table 8.3, Observations 17, 22 and 26, column 8).

Kyle moved easily between different groups of his peers but did not have an established friendship group. Several of the more capable girls appeared to enjoy organising him, ensuring he had his equipment and often cleaning up after him.

Table 8.3

Peer Behaviour in Relation to Time on Task and Academic Engaged Time for Kyle

1 Ob No.	2 LC	3 TD	4 TOT	5 AET	6 IIP	7 IP	8 NP
1	craft	low	40%	n/a	2	1	0
2	Junior assembly	low	55%	n/a	0	2	0
3	learning of poem	med	45%	0%	0	2	1
4	number-practical	med	47%	20%	0	0	0
5	number-worksheet	high	65%	30%	1	1	0
6	language worksheet	high	56%	44%	2	1	0
7	fitness activities	low	0%	n/a	0	3	1
8	sports preparation	low	10%	n/a	1	5	0
9	Sports day	varied	?	n/a	?	?	0
10	morn'g rtne; sh read'g	med	47%	0%	0	2	0
11	Word Bingo	med	15%	10%	0	3	3
12	reading activities	high	45%	45%	0	0	0
13	language/number	high	50%	29%	0	0	0
14	dance practice	low	15%	n/a	0	0	0
15	lunch	low	30%	n/a	*	0	0
16	weaving	med	?	n/a	?	2	1
17	listening activities	high	70%	55%	0	0	0
18	morning routine	med	18%	n/a	0	0	0
19	phonemic activities	med	40%	40%	0	0	0
20	talent audition (aud)	low	0%	n/a	0	4	4
21	org'n activities	low	17%	n/a	0	2	0
22	shared big book	med	75%	70%	0	0	0
23	group read class book	med	33%	27%	0	0	0
24	language worksheet	med	43%	30%	0	0	0
25	sh'd book; worksheet	med	49%	15%	*	0	0
26	morning routine	low	95%	n/a	0	1	0
27	language worksheet	med	60%	20%	2	1	1
28	weaving	low	12%	n/a	?	?	?
29	organisation/dance	low	0%	n/a	0	4	2
			mean = 38%	mean = 29%			

Key

LC	lesson content	IIP	initiated positive interaction with peer
TD	task demand	IP	interfered with peer
TOT	time on task	NP	received negative from peer
AET	academic engaged time	?	data unavailable or not recorded
		*	talked often with peers

8.3.4 Organisation of the physical environment in relation to time on task and academic engaged time for Kyle

Table 8.4 displays the relationships between TOT, AET and aspects of the physical environment. The various components of the physical classroom environment which emerged from the data as being of significance to time on task and academic engaged time for Kyle were combined into two categories: formality of setting and planned seating.

8.3.4.i Formality of setting in relation to time on task and academic engaged time

Analysis of Table 8.4 reveals that most class activity took place in settings of moderate to high formality (see column 7). There was a range of TOT and AET calculated which did not reveal a consistent pattern, apart from the fact that low formality was never associated with high TOT or AET. The formality of the setting during those periods of high time on task was categorised as either medium or high.

During the listening activity (Observation 17), which scored relatively high TOT and AET for Kyle, students were seated at their desks. The teacher wanted to use this as an assessment task. Thus, students were encouraged to do their best and told that their worksheets would be going into their portfolios. There was emphasis on ensuring that their seats were in the right position, that everyone had access to coloured pencils and that everyone was, in the teacher's words *"comfortable and ready to do their best"*. This was clearly a formal setting for Kindergarten students.

During the two other observation periods of high time on task (Observations 22 and 26), students were seated on the carpeted floor in front of the teacher within a large rectangle marked out with packaging tape. Kyle's regular spot was located in the front right hand corner of the rectangle, and was marked with a cross. He was quite

proprietorial about his spot and usually remembered to sit there when directed to the front. Because there was a defined space for the children and because Kyle had a clearly designated position, this setting was considered to be of moderate formality despite the fact that the children were sitting very close to each other and most had peers directly in front of them. A great deal of classroom activity took place in this setting.

Kyle's scores for TOT and AET when the setting was very informal were consistently low. Craft and dance periods were characterised by low levels of formality. Students were not allocated a particular position but were permitted to move around the area. (The dances were individual, rather than folk or more formal dances.) These situations did not promote high TOT for Kyle even though they were of low demand, situations in which Krupski (1985) would suggest that students with ADHD could remain on task.

Another feature of the physical environment which appeared to be of relevance to TOT and AET, particularly with the younger students, was the level of classroom decoration. In many Kindergarten classrooms brightly coloured posters, charts and mobiles decorate the walls and hang from the ceilings. It was noted that mobile decorations (a favourite in many classrooms) which hung from the ceiling (or netting positioned across the ceiling) were a particular distraction if they were hanging between the target students in this study and the teacher, even if they were not particularly low. The constant if subtle movement inherent in a "mobile" served as a major distraction. This was the case in Kyle's classroom. Brightly coloured items also caused some distraction.

A memo recorded after Observation 3 makes reference to the apparent effect classroom decoration had on Kyle:

Response to visual stimuli? Monday, 29/7/96

A fleuro cardboard poster positioned to the left of where the teacher sat during mat activities acted as a constant distraction for Kyle. The poster had been created by the teacher over the weekend and was new to the classroom this morning. It had various animal shapes pasted onto it, all of different colours and representing different language groups. Kyle's eyes were constantly drawn to it and despite repeated teacher redirection, he could not concentrate until she removed the poster and placed it on her desk. This incident was discussed with the teacher after the observation period concluded. The teacher commented on Kyle's off-task behaviour and wondered aloud what the classroom looked like from his perspective. She sat on his "cross" and looked towards where she normally sat during mat activities. She commented on the number of visually stimulating materials that could be seen on walls and hanging from the ceiling. Later that day she removed coloured posters from the front walls and front third of the side walls. She also removed anything that hung from the ceiling in the front third of the classroom. Some decorations such as word walls that were not particularly colourful remained where they were. The rest of the classroom remained as a typically colourful and stimulating Kindergarten classroom.

Because this occurred quite early in Stage Two of data collection there was not the opportunity to compare Kyle's TOT and AET before and after this attempt to make the environment less distracting for him. The teacher did comment later in the term, however, that she believed he was more on task during mat activities from that point on.

8.3.4.ii Planned seating in relation to time on task and academic engaged time

In most situations in the classroom, Kyle was purposively placed near on-task peers or on his spot on the carpet. On those occasions, planned seating was given a rating of high. When students were permitted to move around at will, planned seating was rated as low. Planned seating did not always result in high periods of time on task but was

evident in those observations when Kyle was rated as having relatively high percentages of time on task and academic engaged time.

Table 8.4

Organisation of the Physical Environment in Relation to Time on Task and Academic Engaged Time for Kyle

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 FS	8 PS
1	craft	20	low	40%	n/a	low	low
2	Junior assembly	20	low	55%	n/a	high	low
3	learning of poem	20	med	45%	0%	high	high
4	number-practical	15	med	47%	20%	mod	high
5	number-worksheet	55	high	65%	30%	mod	high
6	language worksheet	25	high	56%	44%	mod	high
7	fitness activities	20	low	0%	n/a	high	low
8	sports preparation	50	low	10%	n/a	mod	high
9	Sports day	180	varied	?	n/a	?	?
10	morn'g rtne; sh read'g	30	med	47%	0%	high	high
11	Word Bingo	20	med	15%	10%	mod	low
12	reading activities	20	high	45%	45%	mod	low
13	language/number	34	high	50%	29%	mod	high
14	dance practice	30	low	15%	n/a	low	low
15	lunch	10	low	30%	n/a	mod	low
16	weaving	30	med	?	n/a	low	low
17	listening activities	40	high	70%	55%	high	high
18	morning routine	20	med	18%	n/a	mod	high
19	phonemic activities	30	med	40%	40%	mod	high
20	talent audition (aud'ce)	50	low	0%	n/a	mod	low
21	organisation activities	12	low	17%	n/a	mod	high
22	shared big book	15	med	75%	70%	mod	high
23	group read class book	15	med	33%	27%	mod	high
24	language worksheet	30	med	43%	30%	mod	low
25	shared book; worksheet	55	med	49%	15%	mod	high
26	morning routine	20	low	95%	n/a	mod	high
27	language worksheet	10	med	60%	20%	mod	high
28	weaving	30	low	12%	n/a	low	low
29	organisation/dance	40	low	0%	n/a	low	low
		total mins = 946		mean = 38%	mean = 29%		

Key

LC	lesson content	AET	academic engaged time
M/O	minutes of observation	FS	formality of setting
TD	task demand	PS	evidence of planned seating
TOT	time on task	?	data unavailable or not recorded

8.3.5 Managing behaviour of teacher in relation to time on task and academic engaged time for Kyle

Table 8.5 reveals how different aspects of the teacher's managing behaviour related to Kyle's time on task and academic engaged time.

8.3.5.i Monitoring behaviour and teacher redirects in relation to time on task and academic engaged time

Analysis of Table 8.5 reveals that on the three occasions when Kyle was on task for 70% or more of the time, the teacher's monitoring behaviour was considered to be high (see column 7), although high monitoring behaviour also occurred on occasions when he was less on-task. There were few teacher redirects to task during periods of high on-task and engaged behaviour (see column 8), presumably because he did not need it.

8.3.5.ii Use of explicit language in relation to time on task and academic engaged time

Table 8.5 (column 9) also reveals that the teacher's use of direct language was also rated as high throughout periods of high time on task. Directions were usually expressed in single sentences with the teacher waiting for compliance before giving another. For example, in Observation 5, she said, *"Kyle, put your hanky in your pocket"*. When he had accomplished this, she said, *"Now put your hands on your knees."* She often said, *"Kyle, turn around. Face the front"*. The fact that she used his name first also ensured that his attention was gained before the direction was given.

8.3.5.iii Positive interactions with target student in relation to time on task and academic engaged time

Kyle's teacher interacted positively with Kyle on a number of observed occasions (see Table 8.5, column 10). Although her frustration with him was evident at times, redirections or reprimands were almost always followed up by a smile or a joke and Kyle responded very warmly to her. Specific instances of positive interactions within observation were not consistently related to periods of high time on task.

8.3.5.iv Evidence of routines in relation to time on task and academic engaged time

Table 8.5 shows that each of the periods of high engagement occurred when the lesson was following routine procedures. The one period of high TOT with a high demand task was of particular interest because of its duration of 40 mins, a considerable time for any Kindergarten student to maintain attention, particularly one diagnosed with ADHD. Factors which may have been of significance in that particular case are discussed in the section on teacher instructional behaviour.

Kyle's teacher used many of the strategies recommended in the literature for students with ADHD, and while there were periods when he was on task to a high level, average TOT and AET are quite low. Possible explanations of this finding are explored further in this chapter and in the discussion chapter.

Table 8.5

Managing Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Kyle

1 ObNo.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 MB	8 TR	9 DL	10 PI	11 R
1	craft	20	low	40%	n/a	high	4	high	0	mod
2	Junior assembly	20	low	55%	n/a	low	0	low	0	high
3	learning of poem	20	med	45%	0%	high	6	high	1	low
4	number-practical	15	med	47%	20%	high	10	high	4	high
5	*number-worksheet	55	high	65%	30%	mod	4	high	3	high
6	language worksheet	25	high	56%	44%	high	3	high	0	high
7	fitness activities	20	low	0%	n/a	low	2	low	0	low
8	sports preparation	50	low	10%	n/a	low	4	high	2	low
9	*Sports day	180	varied	?	n/a	?	?	?	?	?
10	morning routine; sh read'g	30	med	47%	0%	mod	2	high	1	high
11	Word Bingo	20	med	15%	10%	low	1	mod	0	high
12	reading activities	20	high	45%	45%	high	0	high	0	high
13	language/number	34	high	50%	29%	high	9	high	0	mod
14	dance practice	30	low	15%	n/a	?	*	low	0	low
15	lunch	10	low	30%	n/a	n/a	2	high	0	high
16	*weaving	30	med	?	n/a	?	* *	?	?	mod
17	listening activities	40	high	70%	55%	high	0	high	1	high
18	morning routine	20	med	18%	0%	low	3	high	1	high
19	phonemic activities	30	med	40%	40%	mod	5	high	3	high
20	talent audition (audience)	50	low	0%	n/a	low	5	varied	0	low
21	organisational activities	12	low	17%	n/a	high	10	high	0	high
22	shared big book reading	15	med	75%	70%	high	1	high	0	high
23	group reading of class book	15	med	33%	27%	low	2	high	0	high
24	language worksheet	30	med	43%	30%	mod	1	high	3	high
25	shared book; worksheet	55	med	49%	15%	mod	1	high	1	high
26	morning routine	20	low	95%	n/a	high	1	high	0	high
27	language worksheet	10	med	60%	20%	high		high	0	high
28	#*weaving	30	low	12%	n/a	mod	4	high	0	mod
29	#organisation/dance	40	low	0%	n/a	mod	5	varied	0	mod
		total = 946		mean = 38%	mean = 29%					

KEY

M/O	minutes of observation	PI	positive interactions with target student
TD	task demand		
TOT	time on task	R	use of routines
AET	academic engaged time	?	data unavailable or not recorded
MB	monitoring behaviour	#	year 6 student assisted
TR	teacher redirection	*	extended assistance by teacher
DL	direct language		

8.3.5.v Additional managing strategies used by Kyle's teacher

Kyle's teacher mentioned that Kyle needed more cues than most Kindergarten children. The teacher reported that for the first few weeks of the year, Kyle had regularly put things in his tray rather than his bag (which was on the opposite side of the room) and vice versa: it seemed a matter of chance as to where he put things, despite her direction. She then began pointing in the correct direction when she gave an instruction and he almost always successfully completed the task. From that point on she made a habit of adding a visual cue as often as possible when giving directions. This behaviour was noted in a memo recorded after Observation 1:

> **Use of additional visual cues Thursday, 18/7/96**
> Kyle had just completed colouring in a picture of a rooster which was to be cut out at a later date. He was directed to put it in his tray which was on the right side of the room. He headed towards his bag which was on the left side of the room. The teacher called him back and said, *"Kyle, in your tray"* and pointed to where the trays were located. Kyle grinned and moved in the correct direction.

The teacher also mentioned that she had tried to teach Kyle specific strategies to help him stay on task. She had taught him to remind himself in which direction he needed to go when going to the office for his medication. He was to stand at the door and physically point in the direction of the office. This was, in fact, observed on several occasions when he would stop at the door, turn quite deliberately in the direction of the office, point ahead and say: *"Have to go that way"*.

8.3.6 Instructional behaviour of teacher in relation to time on task and academic engaged time for Kyle

Table 8.6 shows associations between Kyle's TOT and AET and the teacher's instructional behaviour. Some consistently strong trends appeared to emerge from this data.

8.3.6.i Level of demonstrations in relation to time on task and academic engaged time for Kyle

Strong teacher demonstrations accompanied the observation periods during which the highest levels of TOT and AET were recorded (see Table 8.6, column 7). It was also noticeable that strong teacher demonstrations occurred for all tasks that were considered high demand.

In Observation 22, the class was reading a big book together under the teacher's close direction. The students were quite familiar with the text (*"Who's in the Shed"* - author and publication details not recorded) and the teacher was emphasising putting expression into their voices. She would say a sentence in a particular way in order to *"make it more exciting"* and *"make people want to hear more"* after which the class would repeat the sentence. The pointer was used to direct attention to each word that was said.

When introducing new worksheets the teacher would always demonstrate on a worksheet pinned to an easel at the front of the room precisely how to complete each section. During practical mathematics lessons she would demonstrate explicitly using concrete materials how each number sentence was created.

8.3.6.ii Level of task setting in relation to Kyle's time on task and academic engaged time

Highly structured task setting also accompanied high demand tasks. The listening task in Observation 17 provided an example of this. The children were issued with a picture of a bear with a honey pot. The listening task required them to follow the teacher's instructions carefully. The teacher gave each instruction three times. The instructions began with straightforward ones (*"Look at the picture. Write your name beside the honey pot."*) and progressed to quite difficult ones, the final instruction being, *"If you*

think the bear has a pocket on his trousers, draw a circle around the whole picture, but if you think he doesn't, put a line under your own name".

Another point worth noting was that all lessons which featured both strong teacher demonstration and highly structured task setting had above average (for Kyle) measures of TOT and AET. This appeared to be a useful combination for him.

8.3.6.iii Direct teacher approach/assistance in relation to Kyle's time on task and academic engaged time

From Table 8.6, it can be noted that Kyle received individual teacher assistance in almost every lesson, often more than once (see column 9). The inclusion of Year 6 students to assist the Kindergarten students during craft and some dancing sessions did not contribute to great changes in Kyle's TOT.

8.3.6.iv Maintenance of momentum in relation to Kyle's time on task and academic engaged time

The momentum of the lessons in which there was highest TOT and AET was well maintained. The effect of interruptions in this classroom was demonstrated by the loss of momentum in those lessons when such interruptions occurred. As an executive member of the staff this teacher experienced more interruptions than most. When they did occur they were usually extended, causing considerable loss of teaching and learning time. Reference to the raw data revealed that often a period of high engagement for Kyle was greatly affected by interruptions. Kyle's loss of engagement in Observations 3, 4, 18 and 21 occurred throughout extended interruptions during those lessons, although he had been on task before they occurred.

The class teacher was aware of the effect of the interruptions and would often joke with the students about the number of *"visitors"* the class received. *"It drives me crazy, and*

we've got to work out a better system" was her comment to the researcher after several interruptions throughout Observation 21 (post observation discussion 15/11/96).

8.3.6.v Frequency and type of feedback in relation to Kyle's time on task and academic engaged time

Table 8.6 reveals that Kyle's teacher provided moderate to high levels of feedback, usually process feedback, throughout academic tasks (see columns 11 and 12). This is in line with recommended practice for students with ADHD. Examples of the type of explicit feedback recorded included, *"Good work, Kyle, you've already written your name"*, (Observation 6) and *"Excellent, Kyle, you, traced that 'f' very carefully"* (Observation 24). Moderate levels of feedback were recorded during the highest periods of TOT and AET.

Table 8.6

Instructional Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Kyle

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 Dem	8 TS	9 TAA	10 MM	11 FF	12 PF
1	craft	20	low	40%	0%	?	?	2	low	high	high
2	Junior assembly	20	low	55%	n/a	n/a	n/a	n/a	mod	low	low
3	learning of poem	20	med	45%	0%	high	mod	1	low	mod	high
4	number-pract	15	med	47%	20%	high	high	1	low	high	high
5	*number-w'sht	55	high	65%	30%	high	high	3	mod	mod	high
6	language w'sheet	25	high	56%	44%	high	mod	3	mod	low	low
7	fitness activities	20	low	0%	n/a	low	mod	1	low	low	low
8	sports prep	50	low	10%	n/a	high	low	1	mod	mod	mod
9	* Sports day	180	var	?	n/a	var	var	many	mod	?	?
10	morn'g routine	30	med	47%	0%	low	mod	0	mod	mod	mod
11	Word Bingo	20	med	15%	10%	low	mod	1	low	low	low
12	reading activities	20	high	45%	45%	high	high	0	high	high	high
13	lang/number	34	high	50%	29%	high	mod	3	low	high	high
14	# dance practice	30	low	15%	n/a	mod	low	2	low	low	low
15	lunch	10	low	30%	n/a	n/a	mod	0	n/a	mod	mod
16	#* weaving	30	med	?	n/a	high	low	2	low	?	?
17	listening activ's	40	high	70%	55%	high	high	1	high	mod	n/a
18	morning routine	20	med	18%	n/a	n/a	low	2	low	low	low
19	phonemic activ's	30	med	40%	40%	high	high	2	low	low	low
20	talent audition	50	low	0%	n/a	n/a	low	0	low	low	low
21	org'n activities	12	low	17%	n/a	n/a	low	0	low	high	low
22	shared big book	15	med	75%	70%	high	high	0	high	mod	mod
23	grp read book	15	med	33%	27%	mod	high	0	mod	high	mod
24	language w'sheet	30	med	43%	30%	high	mod	2	low	mod	mod
25	sh book; w'sheet	55	med	49%	15%	high	mod	1 ext	low	low	low
26	morn'g routine	20	low	95%	n/a	high	low/ mod	0	high	mod	low
27	lang worksheet	10	med	60%	20%	high	high	1	high	mod	mod
28	# *weaving	30	low	12%	n/a	high	low	2	low	mod	high
29	# org/dance	40	low	0%	n/a	mod	low	0	low	low	low
		total = 946		mean = 38%	mean = 29%						

Key

LC	lesson content	TAA	teacher approached/assisted target student
M/O	minutes of observation	MM	level of momentum
TD	task demand	FF	frequency of academic feedback
TOT	time on task	PF	level of process feedback
AET	academic engaged time	?	data unavailable or not recorded
Dem	teacher demonstration	#	year 6 student assisted
TS	level of task structure	*	extended assistance by teacher

8.4 SUMMARY OF DATA RELATED TO KYLE

Kyle's average TOT and AET were relatively low but with higher averages scored for lessons of high demand, which was against the expected trend (Krupski, 1985). Kyle averaged greater time on task throughout morning periods rather than afternoon. Lesson content per se did not appear to affect time on task.

Kyle's behaviour was typical of a student diagnosed with ADHD, but ADHD-type behaviours were less evident when he was on task. He generally maintained good relationships with his peers and was more inclined to initiate interactions with his peers when in less structured settings. Direct teacher assistance was more effective in maintaining Kyle's on-task behaviour than the assistance of a peer or older student. Rather than approach his teacher, Kyle tended to imitate peer behaviour when unsure of what to do. Self-talk appeared to assist him in remaining on task on some occasions.

Medium or high formality of classroom arrangement and seating were evident during periods of high time on task for Kyle. While these factors did not always lead to high levels of engagement, low formality was consistently related to low engagement. A structured setting appeared to be at least one important factor in keeping Kyle on task.

High levels of monitoring behaviour, the use of explicit language and routines were the elements most consistently related to higher periods of time on task for Kyle. Strong teacher demonstrations, highly structured task setting, direct teacher assistance and the maintenance of momentum were also evident when Kyle experienced the highest levels of engagement in class activity. Interruptions to the class appeared to be a significant factor in breaking lesson momentum and contributing to off-task behaviour by Kyle.

8.5 EMERGING TRENDS

Different levels of the ecological environment affected Kyle's performance. His own individual predisposition to attention difficulties, impulsivity and hyperactivity made attending to task difficult, but under certain conditions these individual characteristics were less apparent.

Elements of the classroom environment such as the timing of lessons, the level of task demand, and particular organisational, management and instructional behaviours appeared to have an impact on his ability to remain on task.

What was of particular interest in Kyle's case was the effect that interruptions to the classroom routines had on his ability to stay on task. Interactions between the classroom and the communication system within the school (in Bronfenbrenner's (1979) terms, interactions of two microsystems within the mesosystem) affected class momentum and appeared to have a negative impact on Kyle's ability to remain on task. Communication systems within the school allowed for many interruptions to occur, particularly in classrooms taught by executive members of staff. Despite the fact that the teacher used many strategies recommended for students with ADHD, Kyle's average TOT and AET were relatively low. The wider school system affected the individual class system.

The elements of Kyle's classroom environment which were particularly related to higher levels of TOT and AET will be explored further in the discussion chapter, after consideration of results from other target students.

This chapter has provided an overview of the results relating to Kyle, a Kindergarten student from Site One. The next chapter will analyse the results gained from James, a Kindergarten student from Site Two.

CHAPTER NINE

FINDINGS RELATED TO JAMES

This chapter reports on findings related to James, who was 5.6 at the beginning of the data collection period and enrolled in Kindergarten at Site Two. Background information on James is provided before an analysis of his classroom interactions is presented.

9.1 BACKGROUND INFORMATION ON JAMES

James is the second child in the family, with a sister three years older. At the time of data collection his father was a computer programmer. His mother worked as an administrative assistant before having the children.

9.1.1 Early development

James was born a month prematurely and some kidney dysfunction was diagnosed at eight weeks. He took medication for this condition for three years and was symptom free throughout the observation period. His mother described him as a *"difficult baby who screamed a lot through frustration"* and who didn't appear to feel pain (all parent quotes taken from interview, 25/9/96). He would often rock and headbang. James was late in reaching most early milestones, not walking until he was almost 20 months old.

He began attending preschool at three and his parents felt he had difficulties from the beginning in socialising with the other preschoolers. He was diagnosed with asthma, fitted with grommets and began having speech therapy during his first preschool year.

At the age of three and a half he was attacked by a neighbourhood dog and required 160 stitches in his head. He has significant scarring on his head (most of which is covered by hair) and on the sides of his face, however this does not detract from his appearance in any major way. His parents reported that *"he seemed to lose some knowledge"* after this event, although he was not formally assessed at that time.

9.1.2 Diagnosis of ADHD

James was diagnosed by his paediatrician in September 1994, when aged 4 years and 3 months, as having ADHD "with hyperactivity" (information supplied by the paediatrician in phone interview).

His parents implemented a behaviour management program on the advice of the paediatrician, but after having little success with that, James was prescribed a three month trial of Ritalin. After two days of very unstable, often manic behaviour and severe headaches, James' ability to concentrate improved and his behaviour settled enough for him to be able to play for longer periods. He was on one tablet in the morning, another at 11.30 am and half a tablet at 3.30 pm throughout the period of observation. Medication appeared to have a major impact on James' behaviour, with hyperactivity being evident only when he had not taken medication or he was nearing the next dosage.

Side effects included loss of appetite throughout the day, difficulties in falling asleep, slight eczema and a flushed appearance. For the first two hours after taking his tablet his parents reported that he was *"numb - he takes it in but gives nothing out"*. His parents felt he *"loses his personality"* when medicated but the improvement in his behaviour and ability to concentrate compensated for this.

9.1.3 Formal assessment and progress at school throughout period of research

Preschool assessment in the year prior to data collection using the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R) (Wechsler, 1989) revealed borderline to low average performance across all areas. His highest score was on memory for sentences but this was only in the average range. Language development was assessed as being in the low average range. Within the performance items he scored lowest on mazes, block design and object assembly.

James scored in percentile 61 on the Peabody Picture Vocabulary Test (Dunn, 1981), suggesting a high average receptive language level. The Sutherland Phonological Test (Neilson, 1995) revealed a high average level of phonological development.

According to teacher records, James made average gains throughout the year in prewriting and prereading areas.

9.1.4 Relationships between home and school

James' mother was an active participant in the parent tutor reading program which operated with the Kindergarten grades throughout the period of data collection. She was supportive of the school and of the class teacher, whom she perceived as *"a gentle soul just like James needs"*. There was evidence of considerable support from home in the items that James brought for his News contributions every week. He had usually practised what to say and brought a range of different items for discussion: a CD ROM of computer games which was donated to the class; pop-up books which were also donated; and various construction and craft items that he had made at home.

The class teacher viewed James' parents as *"the ideal parents - they can't do enough to help James. They're always offering to help out, they send in things to do with our*

themes and she's great with the reading program" (teacher interview, 13/12/96). In Bronfenbrenner's (1979) terms, the dyad of teacher and student was supported by supportive links from the home.

9.2 CONCEPTUAL ISSUES HIGHLIGHTED BY FINDINGS RELATED TO JAMES

Issues of importance which were highlighted by findings related to James are as follows:

- the impact of task demand on engaged behaviour;
- individual responses to visual stimuli;
- the relationship between self-talk and task engagement;
- the role of peer models for students with ADHD; and
- the social difficulties of some students diagnosed with ADHD.

9.3 TABULATED DATA FROM CLASSROOM OBSERVATIONS

Table 9.1 provides an overview of the 37 classroom observations of James, showing relationships between time on task, academic engaged time, day and time of observation, lesson content, minutes of observation, task match and task demand. It reveals that James' average TOT over 37 periods of observation was 64% and AET was 42%. Analysis of morning observation periods revealed time on task measures of 65% for morning observation periods and 62% for afternoon periods, revealing little difference. Morning periods of AET scored 47% and afternoon AET scored 33%, revealing some preference for academic activity in the morning.

9.3.1 Task characteristics, time on task and academic engaged time

Analysis of the lesson content (column 3) reveals a relatively high proportion of free play, independent activity, craft and sports activities. Only four of the 37 observation periods included high demand tasks, 13 were of medium demand and 20 of low demand. Most periods of 70% or more time on task were of low or medium demand. James did not have difficulty staying on task when the tasks were not of great demand. The four high demand tasks scored an average of 44% AET, medium demand tasks scored 42% AET and low demand, 40% AET.

Lessons developing the critical skills of literacy and numeracy are likely to be high demand tasks. If students are to gain from these lessons, high levels of AET will be necessary. Therefore, high demand tasks that scored high levels of AET are of particular interest. Only one observation period (No. 24) recorded such a result. In this lesson the class was completing a worksheet based on a big book which had been read earlier.

Table 9.1

Task Characteristics in Relation to Time on Task and Academic Engaged Time for James

1 Ob No.	2 D/T	3 LC	4 M/O	5 TM	6 TD	7 TOT	8 AET
1	Mon mm	maths worksheet	30	med	med	50%	50%
2	Mon aft	language worksheet	30	med	med	10%	10%
3	Tues m	news	15	low	low	22%	n/a
4	Tues mm	free play/morning tea	60	high	low	81%	n/a
5	Wed mm	wordmatch/c/p	40	med	med	50%	50%
6	Wed aft	dance practice	30	med	med	50%	n/a
7	Thurs aft	story/freeplay	35	high	low	100%	n/a
8	Tues m	cut/paste	15	high	low	73%	43%
9	Tues mm	transition/TV show	30	high	low	60%	53%
10	Wed mm	language activities	30	med	high	33%	20%
11	Wed aft	discussion/cut/paste	25	med	low	20%	20%
12	Mon aft	language activities	10	high	high	70%	40%
13	Mon aft	language activities	20	low	med	5%	0%
14	Wed aft	music/movement	20	low	low	30%	n/a
15	Thurs m	independent reading/parent	30	high	med	68%	30%
16	Thurs mm	Junior sport	30	med	low	67%	n/a
17	Mon mm	child protection discussion	15	high	low	86%	n/a
18	Mon aft	colour/cut/paste	25	high	med	92%	60%
19	Tues mm	1:1 reading with mother	10	high	high	50%	50%
20	Wed m	ind reading activities	15	high	low	93%	47%
21	Wed mm	news/handwriting	20	high	low	100%	55%
22	Wed aft	dance practice	25	high	low	76%	n/a
23	Mon m	ind reading activities	30	high	low	63%	24%
24	Thurs mm	language worksheet	20	high	med	87%	80%
25	Thurs aft	language worksheet	35	high	high	80%	66%
26	Fri mm	visiting illustrator dem	55	med	low	49%	n/a
27	Tues m	story writing/free play	30	high	med	83%	60%
28	Fri m	Junior assembly	40	low	low	12%	n/a
29	Tues m	TV story	30	high	low	93%	n/a
30	Thurs m	sport activities	30	high	med	71%	n/a
31	Wed aft	craft	30	high	med	90%	n/a
32	Wed aft	free play	15	high	low	90%	n/a
33	Mon aft	watching pantomime	45	high	low	93%	n/a
34	Wed mm	cooking	30	med	med	63%	n/a
35	Mon m	presentation practice	30	low	low	54%	n/a
36	Tues m	news	10	med	low	60%	n/a
37	Tues mm	diary writing	15	high	med	80%	40%
			Total mins = 1005			mean = 64%	mean = 42%

Key

Ob no.	observation number	TM	task match
D/T	day and time	TD	task demand
LC	lesson content	TOT	time on task
M/O	minutes of observation	AET	academic engaged time

9.3.2 Target student (James) behaviour in relation to time on task and academic engaged time

Table 9.2 presents time on task and academic engaged time percentages in relation to James' own behavior. This revealed the extent to which James' individual behaviour contributed to the ecology of the classroom.

9.3.2.i Evidence of James' ADHD characteristics in relation to time on task and academic engaged time

Table 9.2 (column 7) reveals that it was the attention component of ADHD which emerged strongly as a feature of James' behaviour, with many more ratings of high for attention difficulties than for the other indicators of ADHD behaviour. James was regularly observed gazing around and not focusing on the task at hand but he rarely acted in a manner that disturbed peers. This was confirmed during the teacher interview:

> He's often not "with" us during mat activities. You can tell by his answers to questions. Half the time he hasn't got a clue, even when I think he's paying attention. I notice him just looking all around quite a lot... He doesn't really seem to look at anything in particular when he gazes around - his eyes just wander all over the place - it's not like he's really distracted by a particular thing...nothing holds his attention for long...only playing with the Mobilo (construction materials) or that sort of thing...he can do that for as long as you'll let him. (13/12/96)

There was a marked increase in James' attention when the spoken word was supported by visual aids or materials, as the following memos reveal:

> **Response to visual stimuli? Tues, 23/7/96**
> James' class was seated at the front of the classroom for a News session. Three children, as nominated on a chart displayed in the classroom, had news to report. Throughout the first two

contributions, during which there was nothing being displayed or shown, James gazed around the room as the children reported their news. The third student held up an orienteering display (cardboard with a compass and various maps on it) as he talked about an orienteering activity he had attended with his family the previous weekend. James attended closely during the discussion about the orienteering activity, moving around on his bottom to get a better view. Even when there was a loud noise outside and most of the class turned to look out the window James continued to look at the map. (recorded after Observation 3)

Response to visual stimuli? Wed 25/9/96

The class was seated on the mats for News. The first contributor to the news session had a toy dolphin which she held up as she talked about her recent visit to Seaworld. James moved so he could see the dolphin and looked at it while the girl spoke for two minutes. He closed one eye and appeared to be tracing around the dolphin shape in the air with an index finger as she spoke. The next child spoke about her move into a new house over the weekend, had nothing to show, and James almost immediately started gazing around the room, then started blowing the hair of the girl in front of him until she turned and said *"Don't!"*. He then started playing with his shoelaces. (recorded after Observation 21)

This noticeable response to visual stimuli was also apparent when James watched certain television programs. The following extract refers to his behaviour, and also that of Bailey, the other Kindergarten student at Site Two who was in the same group at the time. Although Bailey was not formally diagnosed, he was also being observed because of his many ADHD-type behaviours.

Response to visual stimuli? Tues, 29/10/96

The two Kindergarten classes had combined to watch a television program. James was seated almost exactly in the middle of the group, not an ideal place for a student with attention difficulties. A story was being told with colourful animated still pictures. The pictures were changing every 15-20 seconds and a zoom effect was

> being used to highlight different parts of the picture as it appeared on the screen. Both James and Bailey watched intently and maintained their attention for the full 10 minutes of the program with barely a single body movement. A new story then started which had the text highlighted along the bottom of the screen as it was spoken. After about three minutes, several of the "regular" students began to get restless, although both Bailey and James maintained attention, which they did right through the colourful credits eight minutes later. (recorded after Observation 29)

These extracts appeared to confirm much of what was observed throughout the year. Visual input was an important factor in assisting these students to remain attentive. The attraction of visual input was also evident when James formed part of an audience for a visiting illustrator and on another occasion for a pantomime. While there was action to be observed, James was clearly attentive. When talking dominated, James would begin gazing around within approximately five seconds. Memos relating to these observations are included in Appendix F.

While James was rarely observed displaying hyperactive or impulsive behaviour in the classroom, reports from the administrative staff stated that his behaviour in the school clinic (when there to take his tablet at 11.30 am) was often *"very hypo"* (informal interview with administrative assistant, 27/9/96). James regularly jumped on the bed in the clinic, rolled around on the bed, kicked his legs in the air, and giggled loudly. On one occasion, James literally ran into the researcher and the principal when running to the administration building to get his medication (field notes 5/9/96). When cautioned by the principal to *"Slow down, mate"* James replied, *"I'm late for my tablet. I go mad if I don't have it."*

Medication appeared to have a noticeable effect on James' behaviour. At one point he was without medication at school for three days. (James' mother had informed the school that she needed to renew James' prescription for Ritalin.) Changes in his

behaviour were clearly observed over this period (see Observations 13 and 14) when he was observed running around the room, wriggling and rolling around on the floor, hitting his head with his hands, bouncing up and down on his bottom, flapping his hands and kicking his legs in the air.

9.3.2.ii "Approaching teacher" behaviour in relation to time on task and academic engaged time

Table 9.2 (column 10) reveals that James approached his teacher for assistance in only 12 of the 37 observation periods. He approached her more than once during Observations 18, 25 and 27 when attention, impulsivity and hyperactivity problems were assessed as being low and when his time on task was respectively 92%, 80% and 83%. This suggests the possibility of some relationship between these factors. Seeking teacher assistance may well be a significant factor in assisting him to determine what the task is, and so to remain on task for longer periods. Being on task also appeared to limit the manifestation of ADHD behaviours. James demonstrated higher levels of TOT and AET with tasks classified as being of moderate or high demand during these observation periods. Teacher assistance may have facilitated these higher levels of engagement.

9.3.2.iii "Initiating positive interaction with peers" in relation to time on task and academic engaged time

James was more likely to approach his peers than he was to approach his teacher, although this was not observed in every observation period (see Table 9.2, column 11). There was not a consistent relationship between approaching peers and either TOT or AET (see column 11 in relation to columns 5 and 6).

9.3.2.iv "Ignoring peer behaviour" in relation to time on task and academic engaged time

A significant feature of James' behaviour was the number of times he ignored positive approaches from his peers, thus this aspect of his behaviour was recorded in Table 9.2. This behaviour did not occur with the other target students. "Interfering with peers" was not a category recorded for James because it did not emerge as a factor of any significance.

Positive approaches from peers did not occur often, but when they did they were almost always ignored (see Table 9.2, column 12). It was noted that throughout several of the observation periods when James was recorded as ignoring peer overtures, he scored high percentages of time on task. There was not, however, a consistent relationship between these two factors.

9.3.2.v "Imitating peer behaviour" in relation to time on task and academic engaged time

James was observed imitating peer behaviour on a regular basis. The following memos illustrate this point:

> **Imitating peer behaviour Thursday, 5/9/96**
> The Kindergarten students were getting their hats from their bags in preparation for sport and gradually assembling on the mat in front of the teacher, who was conducting a clapping game as they assembled. James was one of the last to be seated. The teacher then said *"(Group)Blue people may move to the door now"*. Eight students, including the boy next to James, stood and walked to the door and James followed them. A peer called out, *"James, you're not in Blue"*. The teacher said, *"What group are you in James?"* James said nothing. Another peer, Anthony, called out, *"He's in Green with me"*. The teacher said, *"Sit next to Anthony and go when he goes"*. James sat next to Anthony and moved when he did. (recorded after Observation 16)

Imitating peer behaviour Tuesday, 29/10/96

The two Kindergarten classes had combined in James' room to watch a television program. When it had concluded, the other class was told to stand up and walk quietly to their own classroom next door. James stood as the other students around him (who happened to be in the other class) did and followed them into the other room. When, some minutes later, the other teacher noticed he had joined them, he was sent back to his room. (Recorded after Observation 29)

These examples typify James' behaviour when the students were moving into different groups for language or sport, or the two Kindergarten classes were separating after a combined activity. On most occasions he appeared to follow the student next to him and move when the peer moved rather than listen to instructions.

On the three occasions when sports activities were observed, James spent a short amount of time watching what another child was doing at a particular station and then tried an identical activity himself. There was a variety of things that could be done with most of the equipment, but James invariably did what the student he had been watching had done. A memo relating to these observations may be seen in Appendix F3.

Many other observations confirmed the proposition that James imitated what his peers did. Often he would be observed laughing after everyone else had started laughing at a small joke on the teacher's part or at some incident in a story. He would regularly put up his hand after other children did, and it would become clear that he did not know why hands were being raised. On other occasions he would not move when an instruction was given to pack up or to move on to the next activity, but would do so after observing other students behaving according to instructions.

Table 9.2

Target Student (James) Behaviour in Relation to Time on Task and Academic Engaged Time

1	2	3	4	5	6	7	8	9	10	11	12	13
ObNo.	LC	M/O	TD	TOT	AET	ATT	IMP	HYP	AT	IIP	IgP	ImP
1	maths w'sheet	30	med	50%	50%	mod	low	low	0	1	0	2
2	lang w'sheet	30	med	10%	10%	high	low	low	0	0	0	2
3	news	15	low	22%	n/a	high	low	low	0	0	0	1
4	free play/m tea	60	low	81%	n/a	low	low	low	0	3	0	3
5	wordmatch/c/p	40	med	50%	50%	low	low	low	1	0	1	2
6	dance practice	30	med	50%	n/a	mod	mod	mod	0	0	0	2
7	story/freeplay	35	low	100%	n/a	low	low	low	1	6	0	0
8	cut/paste	15	low	73%	43%	mod	mod	mod	0	2	1	0
9	trans/TV show	30	low	60%	53%	low	low	low	0	0	0	0
10	lang activities	30	high	33% 1:1	20%	high	mod	low	0	1	1	0
11	disc/cut/paste	25	low	20%	20%	high	mod	mod	vols	1	0	4
12	lang activities	10	high	70%	40%	high	mod	mod	0	3	0	1
13	lang activities	20	med	5%	0%	high	high	high	0	0	2	1
14	music/movem't	20	low	30%	n/a	high	high	high	0	0	0	1
15	ind read/parent	30	med	68%	30%	mod	low	low	0	0	1	1
16	Junior sport	30	low	67%	n/a	mod	low	low	0	1	1	1
17	child prot disc	15	low	86%	n/a	low	low	low	0	0	0	0
18	col/cut/paste	25	med	92%	60%	low	low	low	3	0	2	2
19	1:1 rdg/mother	10	high	50%	50%	mod	low	low	1	1	1	0
20	ind read'g acts	15	low	93%	47%	low	low	low	1	1	2	0
21	news/handwr'g	20	low	100%	55%	low	low	low	1	0	0	2
22	dance practice	25	low	76%	n/a	low	low	low	0	0	0	1
23	ind read activ's	30	low	63%	24%	mod	mod	mod	0	4	0	0
24	lang w'sheet	20	med	87%	80%	low	low	low	1	0	0	2
25	lang w'sheet	35	high	80%	66%	low	low	low	2	1	0	2
26	vis'g illust'or	55	low	49%	n/a	high	low	mod	0	0	0	1
27	st writ/frplay	30	med	83%	60%	low	mod	low	2	1	3	0
28	Jun assembly	40	low	12%	n/a	high	mod	mod	0	0	2	0
29	TV story	30	low	93%	n/a	low	low	low	0	0	0	1
30	sport activities	30	med	71%	n/a	mod	low	low	0	0	0	2
31	craft	30	med	90%	n/a	low	low	low	0	1	0	0
32	free play	15	low	90%	n/a	mod	low	low	0	1	0	0
33	watch panto	45	low	93%	n/a	low	low	low	0	0	0	1
34	cooking	30	med	63%	n/a	mod	mod	high	1	0	0	1
35	present'n prac	30	low	54%	n/a	mod	low	low	1	0	0	1
36	news	10	low	60%	n/a	mod	low	low	0	1	0	0
37	diary writing	15	med	80%	40%	low	low	low	1	1	0	0
				mean = 64%	mean = 42%							

Key

LC	lesson content	IMP	impulsivity evident
M/O	minutes of observation	HYP	hyperactivity evident
TD	task demand	AT	approached teacher
TOT	time on task	IIP	initiated positive interaction with peer
AET	academic engaged time	IgP	ignored peer approach
ATT	attention difficulties	ImP	imitated peer behaviour

9.3.2.vi Additional behaviours occurring with time on task and academic engaged time

James was often observed engaging in self-talk throughout periods of higher AET and TOT. During each of the four observation periods which included free play (Observations 4, 7, 27 and 32), it was noted that James talked to himself as he played. While free play is clearly a low demand task, James would often build relatively complex constructions from such materials as Mobilo or Lego blocks. The self-talk usually related to the play objects and task at hand and appeared to help him remain engaged in the activity.

When engaged in colouring in or in higher demand tasks such as mathematics or language activities, self-monitoring talk was noted on numerous occasions. This talk was not directed at anyone; it simply accompanied the activity. When the total time-on-task was not high, analysis of the original data revealed that the periods of engagement did coincide with periods of self-talk. This type of self-talk was absent during off-task periods. Typical of such self-monitoring statements were the following:

> I'm doing number eight now. (Observation 1)
> Have to do this neat. Get a stamp... I done mine. Now I can colour in. (Observation 8)
> I'm up to [t] now. (Observation 10)
> (As he finishes a worksheet) Yeah. I can do this (colouring) now. (Observation 11)
> I'm going to use pink, now...that's the best colour...my pink's the best...that's the right one...I can do this. (Observation 18)
> I can do [v]. [v]'s easy. [v] goes down, up. (Observation 21)
> I'm nearly finished...I'm not scribbling. (Observation 23)
> I'm writing all the writing from my news. (Observation 27)
> This goes on here. Hard to stick...won't stick. Have to be careful. (Observation 31)

9.3.3 Peer behaviour in relation to time on task and academic engaged time for James

Table 9. 3 demonstrates the extent to which James was an isolate within the classroom. He rarely initiated interactions with other students and when he did they were almost always ignored. Column 9 details the number of times James received a negative response from a peer. In James' case, negatives always consisted of being ignored. (Although not negative in an "active" sense, this was considered to be negative for a child who was trying to initiate positive interactions with peers.)

James' isolation was also noted by his mother who mentioned that he had never had any friends, even when in preschool. She regularly invited school and neighbourhood peers to play at their home and they usually came, but *"they played with James' toys, not with James"* (interview with mother, 25/9/96).

An extract from Observation 7 illustrates a typical experience for James:

> [The class had been directed to free play options. James chose one of his favourite construction sets: Mobilo. Two other boys and a girl were also playing with the Mobilo. The following was recorded between 3.03 and 3.16.]
>
> James looked at one boy and said, *"I got one like you,"* holding up a piece. He received no response, not even a glance in his direction. A moment later he said to the same boy, *"You got a lot",* but again received no response.
>
> The two boys left, followed shortly after by the girl who returned after about a minute. James said something (indistinguishable) to her but she did not respond. James then started subvocalising but the content could not be heard.

The other two boys were playing close by, running cars along an upturned tub. James moved over to them and put his Mobilo robot on the tub too. After several seconds James said, *"One nearly went under it. Look. Under it."* The boys did not respond.

James then said, *"How about we live under it so we can hide from the baddies. You guys...'* At this point, James lifted up the corner of the tub but one of the boys said, *"Don't!"* very sharply as he pushed the tub down again. He did not even look at James as he did this.

James appeared unperturbed by this. After about 30 seconds he said, *"You can go like this,"* to another boy who had momentarily joined the group but who moved away without responding. James stood talking to himself and making noises, playing with the robot. He then said, *"Look. Here. It can go up this way"* (up the ramp to the tub) to one of the original boys who ignored the comment. James then said, *"This can be our guard"* to the other boy but that comment was also ignored.

The lack of interaction with James was quite marked. On seven occasions within the thirteen minute period, James tried to initiate interaction with a peer and was ignored. On the one occasion when he tried to physically join in the game occupying two other boys he was sharply rejected. While on most occasions James appeared content to play alone, on this occasion he actively sought interaction but was consistently unsuccessful in engaging his peers.

Table 9.3

Peer Behaviour in Relation to Time on Task and Academic Engaged Time for James

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 IIP	8 IgP	9 NP
1	maths worksheet	30	med	50%	50%	1	0	1
2	language worksheet	30	med	10%	10%	0	0	0
3	news	15	low	22%	n/a	0	0	0
4	free play/morning tea	60	low	81%	n/a	3	0	2
5	wordmatch/c/p	40	med	50%	50%	0	1 1 ig T	3
6	dance practice	30	med	50%	n/a	0	0	1
7	story/freeplay	35	low	100%	n/a	7	0	6
8	cut/paste	15	low	73%	43%	2	1	3
9	transition/TV show	30	low	60%	53%	0	0	1
10	language activities	30	high	33%	20%	1	1	1
11	discussion/cut/paste	25	low	20%	20%	1	0	1
12	language activities	10	high	70%	40%	3	0	1
13	language activities	20	med	5%	0%	0	2	3
14	music/movement	20	low	30%	n/a	0	0	1
15	ind reading/parent	30	med	68%	30%	1	1	1
16	Junior sport	30	low	67%	n/a	1	1	0
17	child prot discussion	15	low	86%	n/a	0	0	0
18	colour/cut/paste	25	med	92%	60%	0	2	3
19	1:1 read'g with mother	10	high	50%	50%	1	1	0
20	ind reading activities	15	low	93%	47%	1	2	0
21	news/handwriting	20	low	100%	55%	0	0	0
22	dance practice	25	low	76%	n/a	0	0	0
23	ind reading activities	30	low	63%	24%	4	0	4
24	language worksheet	20	med	87%	80%	0	0	0
25	language worksheet	35	high	80%	66%	1	0	2
26	visiting illustrator dem	55	low	49%	n/a	0	0	0
27	story writing/free play	30	med	83%	60%	1	3	2
28	Junior assembly	40	low	12%	n/a	0	2	2
29	TV story	30	low	93%	n/a	0	0	0
30	sport activities	30	med	71%	n/a	0	0	n/a
31	craft	30	med	90%	n/a	1	0	1
32	free play	15	low	90%	n/a	1	0	1
33	watching pantomime	45	low	93%	n/a	0	0	0
34	cooking	30	med	63%	n/a	0	0	1
35	presentation prac	30	low	54%	n/a	0	0	0
36	news	10	low	60%	n/a	0	0	2
37	diary writing	15	med	80%	40%	0	0	2
		total = 1005		mean = 64%	mean = 42%			

Key

LC	lesson content	AET	academic engaged time
M/O	minutes of observation	IIP	initiated positive interaction with peer
TD	task demand	IgP	ignored peer
TOT	time on task	NP	received negative from peer

9.3.4 Organisation of the physical environment in relation to time on task and academic engaged time for James

Table 9.4 displays the relationships between time on task, academic engaged time and aspects of the physical environment. The various components of the physical classroom environment which emerged from the data as being of significance to time on task and academic engaged time were combined into two categories: formality of the classroom setting and planned seating.

9.3.4.i Formality of setting in relation to time on task and academic engaged time

Table 9.4 shows that the usual classroom arrangement was rated as moderate in its formality according to the decision rules explained in Chapter Seven. The desks were arranged in groups or rows at various times throughout the year. The level of classroom decoration in this classroom was considered to be moderate. While it was a "typical" kindergarten classroom in that colourful charts, student work and so on were widely displayed on all walls and hung from nets attached to the ceiling, on most occasions these did not intrude on students' line of vision. James was not observed playing with any of these materials inappropriately or being distracted by them throughout the period of timed observations. The teacher commented that she consciously kept classroom decoration out of their reach:

> I deliberately keep the "dangly bits" up fairly high for all their sakes - for safety reasons as much as anything - that doesn't seem to be a major problem for him. (teacher interview, 13/12/96)

The formality of the setting did not appear to have a direct relationship to time on task. The classroom setting was rated as moderately formal throughout the two periods of highest academic engaged time. While James remained on task on self-selected

activities in informal settings very well, the range of activities he selected was extremely limited.

9.3.4.ii Planned seating in relation to time on task and academic engaged time

James was always placed at one end of a row or group of tables at the front of the room and with a peer on only one side. Although the table formations and group compositions changed twice each term, James was always placed in a similar position. This was rated as moderate in terms of planned seating as it was done specifically to help James concentrate:

> Originally I just had a random arrangement - luckily he was close to the front and I realised he was always a bit lost. Now I make sure he's at the front whenever I change the room around...it makes it easier for me to keep an eye on him and helps him concentrate. (teacher interview, 13/12/96)

In Observation 28, planned seating was rated as high (see column 8) because James was removed from the class group and placed next to the teacher when he kept moving his head around, flapping his hands and annoying those around him during an assembly.

There was only one observation period of high AET with a medium- or high- demand task (Observation 24). In this case, the setting was relatively formal and James had been placed at the front of the group of tables. He had only one student next to him and he could look directly at the teacher without having to look past other students.

Examining lessons in which the setting was much less informal revealed that on some occasions James was able to maintain time on task to a high degree (See column 5 for

Observations 4, 7, 16, 20, 23, and 32), although on others, very low averages were recorded (see column 5 for Observations 10, 13, and 14).

Those scoring the highest averages generally had a large component of free choice (see column 5 for Observations 4, 7, and 32) and were of low demand. In these situations, James was almost always able to occupy himself for long periods with large construction toys. The independent reading activities in Observations 20 and 23 were self-selected and so of comparatively low demand. No specific relationships were observed between the formality of the setting and time on task (see columns 5 and 7).

Table 9.4

Organisation of the Physical Environment in Relation to Time on Task and Academic Engaged Time for James

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 FS	8 PS
1	maths worksheet	30	med	50%	50%	mod	mod
2	language worksheet	30	med	10%	10%	mod	mod
3	news	15	low	22%	n/a	mod	low
4	free play/morning tea	60	low	81%	n/a	low	low
5	wordmatch/c/p	40	med	50%	50%	mod	mod
6	dance practice	30	med	50%	n/a	mod	low
7	story/freeplay	35	low	100%	n/a	mod /low	low
8	cut/paste	15	low	73%	43%	mod	mod
9	transition/TV show	30	low	60%	53%	mod	low
10	language activities	30	high	33%	20%	low	low
11	discussion/cut/paste	25	low	20%	20%	mod	mod
12	language activities	10	high	70%	40%	low	low
13	language activities	20	med	5%	0%	low	low
14	music/movement	20	low	30%	n/a	low	low
15	ind reading/parent	30	med	68%	30%	mod	n/a
16	Junior sport	30	low	67%	n/a	low	low
17	child protection discussion	15	low	86%	n/a	mod	low
18	colour/cut/paste	25	med	92%	60%	mod	mod
19	1:1 reading with mother	10	high	50%	50%	mod	n/a
20	ind reading activities	15	low	93%	47%	low	low
21	news/handwriting	20	low	100%	55%	mod	mod
22	dance practice	25	low	76%	n/a	mod	low
23	ind reading activities	30	low	63%	24%	low	low
24	language worksheet	20	med	87%	80%	mod	mod
25	language worksheet	35	high	80%	66%	mod	mod
26	visiting illustrator dem	55	low	49%	n/a	high	low
27	story writing; freeplay	30	med	83%	60%	mod	mod
28	Junior assembly	40	low	12%	n/a	mod	high
29	watch TV story	30	low	93%	n/a	mod	low
30	sport activities	30	med	71%	n/a	mod	low
31	craft	30	med	90%	n/a	mod	low
32	free play	15	low	90%	n/a	low	low
33	watching pantomime	45	low	93%	n/a	mod	low
34	cooking	30	med	63%	n/a	mod	low
35	presentation practice	30	low	54%	n/a	mod	low
36	news	10	low	60%	n/a	mod	low
37	diary writing	15	med	80%	40%	mod	mod
		total = 1005		mean = 64%	mean = 42%		

Key

LC	lesson content	AET	academic engaged time
M/O	minutes of observation	FS	formality of setting
TD	task demand	PS	planned seating
TOT	time on task		

9.3.5 Teacher managing behaviour in relation to time on task and academic engaged time for James

Table 9.5 revealed how different aspects of the teacher's managing behaviour related to James' time on task and academic engaged time

9.3.5.i Monitoring behaviour and teacher redirects in relation to time on task and academic engaged time

The teacher's usual level of monitoring behaviour was rated as moderate to high (see Table 9.5, column 6) according to the decision rules outlined in Chapter Seven. (When recorded incidences of low monitoring behaviour occurred, the regular classroom teacher was not in control. During Observations 13 and 14 the relief from face-to-face [RFF] teacher was in control, and on the other two occasions [Observations 26 and 33] the students were together in the assembly hall watching visiting performers.)

A high level of monitoring behaviour was recorded for the one instance (Observation 24) of high AET and a task of moderate demand. James' teacher mentioned in interview that she was conscious of having to monitor James more closely than the other students:

> I have to be always looking over his shoulder. I need to go back to James after the class explanation and make sure he knows what to do. He definitely needs closer monitoring. (teacher interview, 13/12/96)

There did not appear to be a consistent relationship between teacher redirects and high percentages of time on task (see column 4 in relation to column 7).

9.3.5.ii Use of explicit language in relation to time on task and academic engaged time

The teacher's use of language was recorded as being moderately to strongly explicit on nearly all occasions (see table 9.5, column 8). The one instance of high AET (Observation 24) incorporated the use of strongly directed language. James' teacher almost always preceded individual instructions by the use of the child's name which made it clear to whom she was speaking and reduced confusion.

9.3.5.iii Positive interactions with target student in relation to time on task and academic engaged time

Table 9.5 also reveals that James did not receive a large number of individual positive interactions from his teacher, although her general demeanour with all students in her class was warm and positive.

9.3.5.iv Evidence of routines in relation to time on task and academic engaged time

Table 9.5 also reveals that routines were a constant feature of this teacher's classroom (see column 10). Particular signals, usually clapping patterns, were used to attract attention and signal changing activities. Nearly all classroom activity followed a predictable format, even the free play and sports periods. The students knew which material could be used under what circumstances and how to use the equipment. A typical "academic" lesson would involve some discussion while children were seated together on the mat at the front of the room. The associated worksheet would be displayed and the teacher would work her way through it, explaining each step in a structured manner. The students would then be directed back to their tables to complete the sheet.

Classroom procedures did vary in the way in which students were to deal with their completed worksheets. On some occasions they were to be placed in marking tubs, on other occasions on the teacher's desk, on others the worksheets were to be placed in their individual trays for completion at another time, and on others the completed worksheets were to be placed in their bags to be taken home. It was interesting to note that it was during the concluding stage of lessons that James often became confused. On most occasions he would look to see what his peers were doing, but because they were often ahead of him and already doing another activity, imitating their behaviour did not assist him. Usually the teacher was able to redirect him before he placed materials in the incorrect place due to her high level of monitoring.

Table 9.5

Managing Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for James

1 Ob. No.	2 LC	3 TD	4 TOT	5 AET	6 MB	7 TR	8 DL	9 PI	10 R
1	maths worksheet	med	50%	50%	mod	1	mod	0	mod
2	language worksheet	med	10%	10%	mod	0	mod	0	mod
3	news	low	22%	n/a	mod	0	low	0	high
4	free play/morn'g tea	low	81%	n/a	mod	0	low	0	high
5	wordmatch/c/p	med	50%	50%	mod	1	mod	1	high
6	dance practice	med	50%	n/a	high	3	high	2	mod
7	story/freeplay	low	100%	n/a	mod	1	mod	0	high
8	cut/paste	low	73%	43%	mod	0	mod	0	high
9	transition/TV show	low	60%	53%	mod	1	mod	0	high
10	language activities	high	33%	20%	mod	0	mod	0	mod
11	discussion/cut/paste	low	20%	20%	high	1	mod	0	mod
12	language activities	high	70%	40%	high	2	mod	0	mod
13	language activities	med	5%	0%	low	1	mod	0	mod
14	music/movement	low	30%	n/a	low	0	mod	0	low
15	ind reading/parent	med	68%	30%	high	0	high	2	high
16	Junior sport	low	67%	n/a	mod	1	low	0	high
17	child prot discussion	low	86%	n/a	high	0	high	0	mod
18	colour/cut/paste	med	92%	60%	high	1	high	1	mod
19	1:1 read'g/mother	high	50%	50%	high	1	high	3	mod
20	ind reading activities	low	93%	47%	mod	1	n/a	0	mod
21	news/handwriting	low	100%	55%	high	0	high	2	mod
22	dance practice	low	76%	n/a	mod	2	high	1	mod
23	ind reading activities	low	63%	24%	mod	1	mod	0	mod
24	language worksheet	med	87%	80%	high	0	high	1	mod
25	language worksheet	high	80%	66%	high	2	high	1	mod
26	visiting illustrator	low	49%	n/a	low	3	n/a	0	n/a
27	story writing/play	med	83%	60%	high	1	high	2	mod
28	Junior assembly	low	12%	n/a	mod	3	var	0	mod
29	TV story	low	93%	n/a	mod	0	high	0	mod
30	sport activities	med	71%	n/a	mod	0	low	0	mod
31	craft	med	90%	n/a	high	0	mod	1	mod
32	free play	low	90%	n/a	mod	0	mod	0	mod
33	watching pantomime	low	93%	n/a	low	0	var	0	n/a
34	cooking	med	63%	n/a	high	1	high	1	mod
35	present'n practice	low	54%	n/a	mod	0	high	0	low
36	news	low	60%	n/a	mod	0	mod	0	mod
37	diary writing	med	80%	40%	high	1	high	1	mod
			mean = 64%	mean = 42%					

KEY

LC	lesson content	TR	teacher redirection
TD	task demand	DL	direct language
TOT	time on task	PI	positive interactions with target student
AET	academic engaged time		
MB	monitoring behaviour	R	use of routines

9.3.6 Teacher instructional behaviour in relation to time on task and academic engaged time for James

Table 9.6 shows associations between James' time on task and academic engaged time and the instructional behaviour of the teacher.

9.3.6.i Level of demonstration in relation to time on task and academic engaged time

Demonstrations accompanied most formal activity in the classroom (see Table 9.6, column 6). Demonstrations for the sports periods were not observed during the period of timed observations. The same series of gross motor activities (throwing beanbags, crawling through tunnels, walking on can stilts, skipping with individual and long ropes, and so on) in a circuit formation had been practised all year in the sports periods so students were very familiar with the activities. There was no demonstration for the craft activity in Observation 31 as this was "boxcraft" in which students made creations of their own design. There was no consistent relationship observed between demonstration and high percentages of academic engaged time, although with only two periods of high AET observed any relationship would be difficult to determine (see columns 5 and 6).

9.3.6.ii Level of task setting in relation to time on task and academic engaged time

Examination of Table 9.6, column 7 reveals that the task setting varied according to the task. Most classroom activity followed set routines which reduced the need for much explicit task setting. James' teacher did provide step-by-step instructions for worksheets (see Observations 1, 2, 24 and 25). The most explicit task setting by James' teacher was observed in dance (Observations 6 and 22) and cooking lessons (Observation 34) in which tasks were structured and monitored very closely.

9.3.6.iii Direct teacher approach/assistance in relation to time on task and academic engaged time

In 19 of the 37 observed lessons, the teacher directly approached and/or assisted James, often more than once or for an extended period (see Table 9.6, column 8). These 19 occasions corresponded to the more structured lessons rather than the periods of free choice. Thus, James did receive considerable individual attention from the teacher. There was not a particular relationship between teacher assistance and high percentages of TOT (see column 8 in relation to column 4).

9.3.6.iv Maintenance of momentum in relation to time on task and academic engaged time

Momentum was judged to be moderate throughout most lessons according to the decision rules detailed in Chapter Seven. There was a sense of purpose but not of highly focused activity in the classroom. Set tasks were usually completed by most students and there were few interruptions to classroom procedures. A moderate level of momentum accompanied the one period of high AET (Observation 24).

9.3.6.v Frequency and type of feedback in relation to time on task and academic engaged time

The frequency and type of feedback was variable in James' classroom (see Table 9.6, columns 10 and 11). In some language activities (Observations 10, 11, 24, 25 and 37) there was judged to be high levels of process feedback. Comments such as "*Clever work, James, you've filled in all the right letters*", and *"keep your 'v's the same size, James, like the one at the beginning of the line"* were typical of feedback judged as highly process-oriented. Other comments such as *"neat writing"* were judged as being in the moderate range. A high level of process feedback accompanied the one formal lesson of high AET.

Table 9.6

Instructional Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for James

1 Ob No.	2 LC	3 TD	4 TOT	5 AET	6 Dem	7 TS	8 TAA	9 MM	10 FF	11 PF
1	maths worksheet	med	50%	50%	high	mod	1	mod	mod	high
2	language worksheet	med	10%	10%	high	mod	0	mod	mod	mod
3	news	low	22%	n/a	n/a	low	0	mod	mod	mod
4	free play/morn'g tea	low	81%	n/a	n/a	low	0	mod	mod	low
5	wordmatch;cut;paste	med	50%	50%	high	mod	3	mod	high	high
6	dance practice	med	50%	n/a	high	high	3	low	mod	high
7	story/freeplay	low	100%	n/a	n/a	low	1	mod	mod	low
8	cut/paste	low	73%	43%	high	mod	0	mod	mod	mod
9	transition/TV show	low	60%	53%	n/a	mod	0	mod	mod	low
10	language activities	high	33%	20%	n/a	mod	3 ext	mod	high	high
11	discuss'n/cut/paste	low	20%	20%	mod	mod	1	mod	high	high
12	language activities	high	70%	40%	mod	mod	3	mod	?	?
13	language activities	med	5%	0%	low	low	0	low	low	low
14	music/movement	low	30%	n/a	high	low	0	mod	mod	mod
15	ind reading/parent	med	68%	30%	n/a	high for1:1	1 ext	mod	?	?
16	Junior sport	low	67%	n/a	n/a	mod	3	mod	low	low
17	child prot discussion	low	86%	n/a	n/a	mod	0	mod	mod	mod
18	colour/cut/paste	med	92%	60%	n/o	mod	1	mod	high	mod
19	1:1 read'g/mother	high	50%	50%	n/a	high	0	?	?	?
20	ind reading activities	low	93%	47%	n/a	low	0	mod	low	low
21	news/handwriting	low	100%	55%	high	mod	1	mod	mod	mod
22	dance practice	low	76%	n/a	high	high	2	mod	mod	high
23	ind reading activities	low	63%	24%	n/a	low	0	mod	low	low
24	language worksheet	med	87%	80%	n/o	mod	1 ext	mod	high	high
25	language worksheet	high	80%	66%	high	mod	2	mod	high	high
26	visit'g illust'or dem	low	49%	n/a	n/a	mod	0	n/a	n/a	n/a
27	story writing	med	83%	60%	n/o	mod	1	mod	high	high
28	Junior assembly	low	12%	n/a	n/a	mod	0	low	n/a	n/a
29	TV story	low	93%	n/a	n/a	mod	0	high	n/a	n/a
30	sport activities	med	71%	n/a	n/a	mod	1(mother)	mod	low	low
31	craft	med	90%	n/a	n/o	mod	0	mod	mod	mod
32	free play	low	90%	n/a	n/a	low	0	low	low	low
33	watch pantomime	low	93%	n/a	n/a	mod	0	n/a	n/a	n/a
34	cooking	med	63%	n/a	high	high	1	mod	mod	mod
35	present'n practice	low	54%	n/a	high	high	1	low	mod	mod
36	news	low	60%	n/a	n/a	mod	0	mod	mod	mod
37	diary writing	med	80%	40%	mod	mod	1	mod	high	high
			mean = 64%	mean = 42%						

Key

LC	lesson content	Dem	teacher demonstration	PF process feedback
TD	task demand	TS	level of task structure	? data not recorded
TOT	time on task	TAA	teacher approached/assisted	n/o not observed
AET	academic engaged time	MM	maintenance of momentum	ext extended
		FF	frequency of feedback	

9.4 SUMMARY OF DATA RELATED TO JAMES

Only four of the 37 observations incorporated high demand tasks and only one period of formal classroom activity scored 70% or above AET. Thus, relationships which supported engagement in high demand tasks were hard to detect in James' case. It was clear, however, that James had little difficulty remaining on task during free choice activity when he was content to occupy himself, usually with large construction materials.

When engaged in more formal classroom activity it was the attention aspect of ADHD which was most observable in James' behaviour. The use of visual aids and materials appeared to assist maintenance of attention for James. The use of self-talk also appeared to assist him in this regard. Hyperactive behaviour was noted when he was not medicated. James was more likely to imitate peer behaviour than request teacher assistance.

James regularly ignored, and was ignored by, his peers. Social difficulties had been apparent since preschool and were persisting in the first year of formal schooling.

There appeared to be no consistent relationship between the formality of the setting, seating position and on-task behaviour for James. He was able to maintain on-task behaviour in quite unstructured settings if the activity was of low demand, and particularly free choice.

The one observed occasion of high AET on a task of moderate demand included high monitoring behaviour, the use of direct and explicit language and the use of strong routines. There was no demonstrated relationship between high AET and positive interactions between teacher and target student.

Demonstrations accompanied most formal activity although there was no consistent relationship between this element of the classroom ecology and TOT or AET. Consistent use of routine activity greatly reduced the need for much explicit task setting. A moderate level of momentum was noted during the one period of AET over 70%. High levels of process feedback were also evident during the one teacher-directed lesson of high AET.

9.5 EMERGING TRENDS

The most consistent findings relating to James were his apparent use of self-talk, his response to visual aids and materials in the classroom, and the way in which he imitated his peers.

Self-talk, James' individual strategy, appeared to be helpful for maintaining attention to task. The teacher's monitoring behaviour appeared to assist James maintain engagement during higher demand tasks although it was difficult to determine relationships important for the maintenance of attention to high demand tasks because only four of them were observed. While it was clear that James had little difficulty engaging in extended on-task activity when the activity was of low demand or free choice, propositions regarding what classroom variables may assist him in remaining on task for higher demand tasks were difficult to make.

This chapter has looked in detail at data gained from systematic observations of James. The next chapter will analyse results relating to Ricky, a Year Three student who was observed across four different settings.

CHAPTER TEN

FINDINGS RELATED TO RICKY

In this chapter, information regarding Ricky is presented. Firstly background information gained from parent interviews is presented to provide a context for the following data summaries. (All parent quotes in this introductory section emanated from an interview on Tuesday, 19/11/96.) In some categories columns have been added to the tabled information on various aspects of the classroom ecology because additional factors appeared to be of relevance in Ricky's case.

In Ricky's case there was the opportunity to observe him with four different teachers in two different settings. Results in each case were quite different and provided useful comparative data.

Ricky's class was a composite 2/3 which had two teachers: Cheryl who taught on Mondays and Tuesdays; and Jacqui who taught on Wednesdays, Thursdays and Fridays. Early in the second data collection period, Ricky joined the Intensive Reading (IR) class from 9.00 - 1.00 for a twelve week period. This class was located at the same school, although it took students from different schools in the area. After five weeks, the regular Intensive Reading teacher, Hilary, took long service leave for six weeks and the class was taught by a casual Intensive Reading teacher, Rose.

Results for Ricky are therefore presented in a slightly different format. Observations recorded when he was with each different teacher are placed together, rather than chronologically, as is the case with the other target students. This facilitated analysis as factors relating to the teachers emerged as being very significant in Ricky's case.

10.1 BACKGROUND INFORMATION ON RICKY

10.1.1 Early development

Ricky is one of two children, having a sister 13 months younger. At the time of data collection both parents worked in the retail industry. His mother reported a strong family history of non-compliant, hyperactive and impulsive behaviour on her husband's side and referred to herself as *"a tad that way inclined myself"* (parent interview, 17/10/96 - all quotes in this section have been drawn from this interview). The principal reported her as being *"a tireless supporter of her son but impossible to have a rational conversation with because she's more hyperactive than Ricky"* (principal interview, 4/5/96). Ricky was aged 8.2 at the beginning of the observation period and was in the Year 3 cohort of a composite 2/3 class.

According to his mother Ricky had been demanding *"since the moment of conception"*. He was so active in utero that his mother reported feeling *"like my body was possessed"*. His early nickname of *"the gremlin"*, bestowed before birth, has persisted. There were no birth complications and early physical development was normal apart from some mild asthma and bronchial problems. He displayed some aggressive and noncompliant tendencies from an early age but his mother stated that usually he was *"affectionate and kindhearted"*. He walked at 11 months and by 18 months had mastered childproof fences. He has always excelled at gross motor activities and is proficient at all sports.

His parents had difficulties managing Ricky's sleeping (or not sleeping) patterns and hyperactive behaviour and his mother reported that they *"were Tressillian's* (early childhood and family support service) *best customers"* throughout his early years. He was sleeping well throughout the period of the research, *"through complete exhaustion"*, according to his mother.

He began preschool at three but found it difficult to settle in because of poor concentration levels. Preschool teachers recommended several strategies such as giving instructions one at a time, warning him about changes to routines and preparing him for changes in activities. They also recommended that the parents keep a strict time schedule at home.

No major problems were reported in Kindergarten although Ricky's mother believes this was because he had an exceptionally organised and experienced teacher. Half way through Year 1, she reported, *"the wheels fell off"*. Ricky became progressively more frustrated and angry. He couldn't maintain the progress levels of the rest of the class as they developed reading skills. Both parents did a parenting course and it was at this course that they heard about ADHD when another attendee lent them a book. *"I knew that's what Ricky had as soon as I read it"* was his mother's comment.

10.1.2 Diagnosis Of ADHD

Formal assessment and diagnosis of ADHD of the combined type followed soon after. A trial of Ritalin resulted in his parents reporting *"dramatic changes"* in Ricky's behaviour and concentration levels. Progress at school was still limited and his mother advocated strongly on her son's behalf to the point of writing to the Minister for Education for his acceptance into the Intensive Reading class.

10.1.3 Formal assessment and progress at school throughout period of research

Ricky made significant gains in reading [the equivalent of 2.3 years as assessed on the Neale Analysis of Reading Ability - Revised (Neale, 1988)] while attending the Intensive Reading classes from 9.00 to 1.00 each day for twelve weeks (August to October) throughout the year of observation. During this time he missed considerable input in other subjects. One of his two regular teachers was concerned that progress in

reading had to be achieved at the expense of other subjects, particularly mathematics. Overall, according to class achievement tests, Ricky operated in the lowest 25% of the Year 3 group within the composite 2/3 class. In the Year 3 Basic Skills Test he scored in the lowest band for both numeracy and literacy.

10.1.4 Relationships between home and school

Ricky's mother was greatly involved in many aspects of school life, regularly contacted the teachers and was a strong supporter of her son. Comments she made herself regarding the likelihood that she and Ricky's father shared characteristics of ADHD were supported by Ricky's teachers. She was seen to have *"the best intentions in the world"* (teacher interview 6/12/96) but often an inappropriate way of executing them. All of Ricky's teachers believed that he would have benefited from a somewhat more relaxed and organised home life, but were cognizant of the fact that his parents always operated with the best interests of their son in mind.

10.2 CONCEPTUAL ISSUES HIGHLIGHTED BY FINDINGS RELATED TO RICKY

The following issues were highlighted in Ricky's case:

- the effects of ADHD-type behaviours on task engagement of all students;
- the relative lack of significance of class size to time on task and engagement time;
- the relationship between the teacher's use of direct language and academic engagement;
- the relationship between teacher management strategies and academic engagement; and
- the relationship between instructional strategies and academic engagement.

10.3 TABULATED DATA FROM CLASSROOM OBSERVATIONS

Table 10.1 provides an overview of the 32 classroom observations of Ricky showing relationships between time on task, academic engaged time, the teacher, day and time of observation, lesson content, minutes of observation, task match and task demand.

It was appropriate to calculate Ricky's AET and TOT with different teachers separately as even cursory examination of the data revealed large differences in the measures that would be lost in overall average calculations. These are most easily viewed in tabular form and are presented in Table 10.2.

Time on task and academic engaged time were quite varied with different teachers. Percentages were higher for both measures when Ricky was in the Intensive Reading class, particularly with Hilary. Academic engaged time, task completion and task success have tended to favour lower student-teacher ratios, particularly for students receiving special education services (Thurlow, Ysseldyke, & Wotruba, 1988a). There were only six students in the IR class. It would have been reasonable to expect that Ricky would be more on task in this class but the results were not that straightforward. In fact there was very little difference in Ricky's average TOT and AET when in the composite class with Jacqui and when in the much smaller IR class with Rose. Class size was clearly not the only factor having an effect on Ricky's time on task.

Although Ricky's experience with four different teachers presented interesting comparative data, it must be pointed out that the number of observations with each individual teacher was necessarily limited. In one case, only six observations were made and the most made with any teacher was nine. Thus, caution must be used when using averages as they can be distorted quite easily with such small numbers.

Nevertheless, further analysis of Ricky's AET and TOT revealed consistent patterns with at least two of his teachers, even after considering the differences between a regular classroom and a specialist reading class. He was consistently more on task when in Hilary's class than when in Cheryl's. It is acknowledged that the role of a composite class teacher is more complex and multi-factorial than that of a specialist reading teacher, but it should be noted even at this stage that average TOT and AET between the two composite class teachers and the two reading teachers were quite different. Possible explanations for these findings will be discussed further in Chapter Thirteen.

10.3.1 Task characteristics, time on task and academic engaged time

Table 10.1 reveals that the level of task demand was either high or medium during observations of Ricky with Cheryl. Academic engaged time on high demand tasks was 14%, but only 8% on low demand tasks. This is not what would be expected on the basis of the research conducted by Krupski (1985) who concluded that students with attention problems were more likely to remain engaged in low demand tasks.

Averages for the different levels of task demand in Jacqui's class would not be meaningful with such a small number of observations.

Table 10.1 also reveals that academic engaged time on high demand tasks in Hilary's class was 67%, with the TOT measure calculated as 87%. High levels of AET on high or medium demand tasks occurred most often in Hilary's class as can be noted by reference to the shaded areas in Table 10.1 (Observation 17, 19, 20 and 22, column 8).

When Ricky was in Rose's class, he scored 50% AET on medium demand tasks and 69% of TOT. One occurrence of high AET on a medium demand task was recorded when Ricky was in Rose' class (see Observation 26).

Table 10.1

Task Characteristics in Relation to Time on Task and Academic Engaged Time for Ricky

1 Ob No.	2 Teacher	3 D/T	4 LC	5 M/O	6 TM	7 TD	8 TOT	9 AET
1	Cheryl	Tues m	sp/lang acts	50	med	high	20%	17%
2	Cheryl	Tues mm	maths	25	med	high	12%	12%
3	Cheryl	Tues m	diary writing	17	med	med	18%	18%
4	Cheryl	Mon aft	maths	30	med	high	20%	13%
5	Cheryl	Tues mm	handwriting	30	low	med	7%	7%
6	Cheryl	Tues m	news	15	med	low	8%	n/a
7	Cheryl	Mon aft	maths	15	med	high	7%	7%
8	Cheryl	Mon aft	geometry	50	high	high	24%	22%
9	Cheryl	Tues aft	social science	20	med	med	0%	0%
							mean = 14%	mean = 13%
10	Jacqui	Thurs mm	maths	30	high	high	73%	60%
11	Jacqui	Fri aft	language	20	med	med	33%	27%
12	Jacqui	Thurs mm	craft	15	high	low	73%	20%
13	Jacqui		pers devt disc	20	med	low	59%	45%
14	Jacqui	Thurs aft	col worksheet	15	med	low	82%	67%
15	Jacqui	Thurs aft	news	10	med	low	80%	40%
							mean = 67%	mean = 43%
16	Hilary	Thurs m	aerobics perf	15	high	low	60%	n/a
17	Hilary	Thurs m	IR	45	high	med	100 %	78%
18	Hilary	Fri mm	1:1 couns'ing	30	n/a	low	100 %	n/a
19	Hilary	Mon mm	IR	40	high	high	93%	73%
20	Hilary	Thurs mm	IR	40	high	high	89%	85%
21	Hilary	Tues m	IR	50	high	high	80%	22%
22	Hilary	Fri m	IR	30	high	high	100 %	99%
23	Hilary	Mon m	IR	30	high	high	80%	57%
24	Hilary	Thurs mm	IR	30	high	high	80%	63%
							mean = 87%	mean = 68%
25	Rose	Mon mm	IR	30	high	med	80%	54%
26	Rose	Tues m	IR	40	high	med	82%	78%
27	Rose	Mon mm	IR	20	high	med	72%	50%
28	Rose	Tues m	listen story	15	high	low	80%	13%
29	Rose	Thurs mm	IR	25	high	med	80%	67%
30	Rose	Wed mm	IR	30	high	med	63%	30%
31	Rose	Thurs m	IR	40	high	med	60%	45%
32	Rose	Mon mm	IR	30	high	med	43%	27%
				total = 902			mean = 70%	mean = 46%

Key

Ob No.	observation number	TM	task match
D/T	day and time of observation	TD	task demand
LC	lesson content	TOT	time on task
IR	intensive reading lessons	AET	academic engaged time
M/O	minutes of observation		

Table 10.2

Average Time on Task and Academic Engaged Time Measures for Ricky with Individual Teachers

Teacher	Average TOT	Average AET
Cheryl (composite)	14%	13%
Jacqui (composite)	67%	43%
Hilary (IR)	87%	68%
Rose (IR)	70%	46%

10.3.2 Target student (Ricky) behaviour in relation to time on task and academic engaged time

Table 10.3 presents time on task and academic engaged time percentages in relation to Ricky's own behaviour. This revealed the extent to which Ricky's individual behaviour contributed to the ecology of the classroom.

10.3.2.i Evidence of ADHD characteristics in relation to time on task and academic engaged time

There were clear differences apparent in Ricky's behaviour in different classes. Attention problems, impulsivity and hyperactivity were most often evident to a high degree when in Cheryl's class. He left his desk constantly, "flitted" from one activity or conversation to the next, moved his arms in large arcs as part of his conversations, interrupted and talked almost continuously, and rarely attended to a high demand task for more than a few seconds. These behaviours were least evident in Hilary's class. This was consistent with the fact that Ricky was on task more often in Hilary's class and least often in Cheryl's. Brief extracts from field note summaries exemplify the differences between his behaviour in the two classrooms.

Within a fourteen minute period during Observation 1, Ricky was observed engaging in the following activities in Cheryl's classroom:

> Ran across chairs to get to the front of the room...waved a ruler in the air...ran to blackboard and wrote on it with his finger...stamped feet loudly...moved quickly under his table...rocked on his chair..."jumped" the chair around...stood up on his chair and waved a worksheet while calling to the teacher...crawled along floor to front of room...slid around floor on his back .

This may be compared with the following field extract summary which covers a 14 minute period in Hilary's classroom:

11.09	Teacher directed the class to start individual activities. Ricky started a reading activity.
11.10	Ricky said *"I won't be away"* after another student commented to the teacher that he would be on an excursion the next day. Ricky did not lift his head or stop working as he did this. Continued completing worksheet.
11.15	Ricky took worksheet to the teacher, who was working with another student 1:1 . Teacher said, *"Where's the marking tray?"* Ricky walked to her desk, put the completed sheet in the tray on her table and returned to desk. He started working on a spelling activity, quietly mouthing the words as he wrote them.
11.23	Ricky completed the sheet and took it to the marking tray. The teacher called him over for his 1:1 session. (From field notes recorded on Thursday, 5/9/96)

These extreme differences will be explored further in Chapter Thirteen.

10.3.2.ii "Approaching teacher" behaviour in relation to time on task and academic engaged time

Unlike the Kindergarten students Ricky was more likely to approach the teacher for assistance or clarification than to model his peers and he did this with all his teachers. Hilary was approached slightly more often than the other three teachers (see

Observations 17 to 24, column 10). There was no clear relationship between this factor and TOT or AET. Ricky approached his teacher at least once during eleven of the seventeen observation periods of high AET.

10.3.2.iii "Initiating positive interaction with peers" in relation to time on task and academic engaged time

Ricky initiated positive interactions with his peers quite regularly (see column 11), but not to request assistance. Interactions normally took the form of sharing a joke, showing something or just making conversation while doing something else. These interactions were not recorded as "interfering with peers" unless they received a negative response or occurred when the teacher had specified no talking. They occurred in his four different settings, with slightly more occurrences recorded when in Hilary's classroom. As Ricky was on task most often when in Hilary's classroom, it appears that positively interacting with peers, to some extent at least, does not detract from TOT or AET.

10.3.2.iv "Interfering with peers" in relation to time on task and academic engaged time

Table 10.3 (column 12) reveals that Ricky was regularly observed interfering with peers when in Cheryl's class but not often when in the other classes. Interfering with peers was not associated with high percentages of TOT or AET.

10.3.2.v "Imitating peer behaviour" in relation to time on task and academic engaged time

This was not a feature of Ricky's behaviour with any of his teachers as it was with the younger students (see column 13).

10.3.2.vi Additional behaviours occurring with time on task and academic engaged time

Table 10.3 also reveals that periods of higher TOT and AET for Ricky were often associated with self-talk, although not exclusively. These occurred most often with medium or high demand tasks. Examples included:

> *"Not that one...must be the other one then."*. (from Observation 19, when completing a b/d discrimination exercise on the computer)
>
> *"Yay, one right for me"*. (when completing the same activity)
>
> *"b-a-b that's not a word. b-b-b that's not a word. A word's not a word unless it's got a vowel"*. (from Observation 20, when completing CVC words by adding middle letters)
>
> *"Doesn't fit there...must be another hole...maybe on the other side"*. (from Observation 26, when trying to connect the Language Master)

Jacqui also reported that he often kicked his legs when lying on the floor marking. (The cohort from one year level often marked work with the teacher at the front of the classroom while the other year level did seatwork. Students were allowed to lie down if they wished.) The teacher mentioned that she used to stop him kicking his legs but realised that he remained on task longer when he was allowed to continue.

Table 10.3
Target Student (Ricky) Behaviour in Relation to Time on Task and Academic Engaged Time

1 Ob No.	2 Teacher	3 LC	4 TD	5 TOT	6 AET	7 ATT	8 IMP	9 HYP	10 AT	11 IIP	12 IP	13 ImP	14 ST
1	Cheryl	sp/lang acts	high	20%	17%	high	high	high	3	1	4	0	-
2	Cheryl	maths	high	12%	12%	high	mod	high	3	0	5	0	-
3	Cheryl	diary writing	med	18%	18%	high	high	high	0	0	4	0	-
4	Cheryl	maths	high	20%	13%	mod	mod	mod	2	2	3	1	mod
5	Cheryl	handwriting	med	17%	17%	high	high	high	0	0	4	0	-
6	Cheryl	news	low	8%	n/a	high	high	high	2	0	2	0	-
7	Cheryl	maths	high	7%	7%	high	high	high	0	0	3	0	-
8	Cheryl	geometry	high	24%	22%	high	mod	mod	1	2	1	0	-
9	Cheryl	social science	med	0%	0%	high	high	high	0	1	2	0	-
				mean = 14%	mean = 13%								
10	Jacqui	maths	high	73%	60%	mod	high	low	3	1	0	0	mod
11	Jacqui	language	med	33%	27%	high	low	low	1	0	0	0	-
12	Jacqui	craft	low	73%	20%	mod	low	low	0	1	0	0	mod
13	Jacqui	pers devt disc	low	59%	45%	high	high	mod	0	0	2	0	-
14	Jacqui	col worksheet	low	82%	67%	mod	mod	mod	1	1	0	0	mod
15	Jacqui	news	low	80%	40%	low	low	low	0	0	0	0	-
				mean = 67%	mean = 43%								
16	Hilary	aerobics perf	low	60%	n/a	mod	high	high	0	2	0	0	-
17	Hilary	I R	med	100%	78%	low	mod	low	4	1	0	0	high
18	Hilary	1:1 counsel'g	low	100%	n/a	low	low	low	0	n/a	0	n/a	high
19	Hilary	I R	high	93%	73%	low	low	low	2	0	0	0	high
20	Hilary	I R	high	89%	85%	low	low	low	2	2	0	0	high
21	Hilary	I R	high	80%	22%	mod	low	low	3	2	2	0	-
22	Hilary	I R	high	100%	99%	low	low	low	1	0	0	0	high
23	Hilary	I R	high	80%	57%	low	low	low	1	1	0	0	high
24	Hilary	I R	high	80%	63%	low	low	low	2	2	2	0	-
				mean = 87%	mean = 68%								
25	Rose	I R	med	80%	54%	low	low	low	2	0	0	0	-
26	Rose	I R	med	82%	78%	mod	low	low	1	0	0	0	high
27	Rose	I R	med	72%	50%	mod	high	low	0	2	0	0	-
28	Rose	listen story	low	80%	13%	low	mod	low	0	0	0	0	-
29	Rose	I R	med	80%	67%	low	low	low	0	1	0	0	-
30	Rose	I R	med	63%	30%	low	mod	mod	2	0	0	1	-
31	Rose	I R	med	60%	45%	mod	mod	mod	1	1	0	0	high
32	Rose	I R	med	43%	27%	mod	mod	mod	1	3	0	0	-
				mean = 70%	mean = 46%								

Key

LC	lesson content	ATT	attention difficulties	IIP	approached peer
TD	task demand	IMP	impulsivity evident	IP	interfered with peer
TOT	time on task	HYP	hyperactivity evident	ImP	imitated peer beh
AET	academic engaged time	AT	approached teacher	ST	self-talk

10.3.3 Peer behaviour in relation to time on task and academic engaged time for Ricky

Table 10.4 (column 9) demonstrates ways in which Ricky's peers responded to him in the classroom. Column 9 gives the frequency of negative reponses from his peers for each observation period. These were noted only when Ricky was in Cheryl's class. Column 8 reveals the number of times Ricky interfered with his peers which was also greater when in Cheryl's class. This usually occurred when he bumped desks, lost items, lost points for his team, or interfered for a prolonged period with the class routine. His peers tolerated this interference to a considerable extent with many interferences not receiving any negative feedback. Ricky's peers were usually entertained by his energetic story telling, enjoyed his jokes and responded positively to his word play.

When scoring high percentages for both TOT and AET, Ricky did not receive negative responses from peers. This suggests that when students with ADHD are engaged in legitimate classroom activity there are added benefits for all students and that classroom friction in general may be reduced.

Table 10.4

Peer Behaviour in Relation to Time on Task and Academic Engaged Time for Ricky

1 Ob No.	2 Teacher	3 LC	4 TD	5 TOT	6 AET	7 IIP	8 IP	9 NP
1	Cheryl	sp/lang acts	high	20%	17%	1	4	3
2	Cheryl	maths	high	12%	12%	0	5	0
3	Cheryl	diary writing	med	18%	18%	0	4	1
4	Cheryl	maths	high	20%	13%	2	3	0
5	Cheryl	handwriting	med	17%	17%	0	4	0
6	Cheryl	news	low	8%	n/a	0	2	1
7	Cheryl	maths	high	7%	7%	0	3	0
8	Cheryl	geometry	high	24%	22%	2	1	0
9	Cheryl	HSIE	med	0%	0%	1	2	0
				mean = 14%	mean = 13%			
10	Jacqui	maths	high	73%	60%	1	0	0
11	Jacqui	language	med	33%	27%	0	0	0
12	Jacqui	craft	low	73%	20%	1	0	0
13	Jacqui	pers devt disc	low	59%	45%	0	2	0
14	Jacqui	col worksheet	low	82%	67%	1	0	0
15	Jacqui	news	low	80%	40%		0	0
				mean = 67%	mean = 43%			
16	Hilary	aerobics perf	low	60%	n/a	2	0	0
17	Hilary	IR	med	100%	78%	1	0	0
18	Hilary	1:1counsel'g	low	100%	n/a	0n/a	0	0
19	Hilary	IR	high	93%	73%	0	0	0
20	Hilary	IR	high	89%	85%	2	0	0
21	Hilary	IR	high	80%	22%	2	2	0
22	Hilary	IR	high	100%	99%	0	0	0
23	Hilary	IR	high	80%	57%	1	0	0
24	Hilary	IR	high	80%	63%	Y	2	0
				mean = 87%	mean = 68%			
25	Rose	IR	med	80%	54%	0	0	0
26	Rose	IR	med	82%	78%	0	0	0
27	Rose	IR	med	72%	50%	2	0	0
28	Rose	listen story	low	80%	13%	0	0	0
29	Rose	IR	med	80%	67%	1	0	0
30	Rose	IR	med	63%	30%	0	0	0
31	Rose	IR	med	60%	45%	1	0	0
32	Rose	IR	med	43%	27%	3	0	0
				mean = 70%	mean = 46%			

Key

LC	lesson content	AET	academic engaged time
IR	intensive reading lessons	IIP	approached peer
TD	task demand	IP	interfered with peer
TOT	time on task	NP	received negative from peer

10.3.4 Organisation of the physical environment in relation to time on task and academic engaged time for Ricky

Table 10.5 displays the relationships between time on task, academic engaged time and aspects of the physical environment. The various components of the physical classroom environment which emerged from the data as being of significance to time on task and academic engaged time were combined into two categories: formality of the setting and planned seating.

10.3.4.i Formality of setting in relation to time on task and academic engaged time

Differences were recorded in the levels of formality of the four different classroom settings (see column 7), with low formality being a feature of Cheryl's and Jacqui's classroom and greater formality being a feature of the specialist reading classroom.

The desks in the composite classroom were arranged in table groups of four to six students (See Figure 10.1). Students had their bags around their tables and could access them whenever they wished. The tolerance of movement around the classroom also contributed to the rating of low formality. A mobile whiteboard was positioned at different places around the room depending on which class group was using it. Tubs of resources were located on bookshelves and on the floor and were moved according to the group using them at the time. Observations 11 and 13 with Jacqui were recorded as having a moderate level of formality because the students were expected to stay in their seats and the discussion was more strongly directed by the teacher.

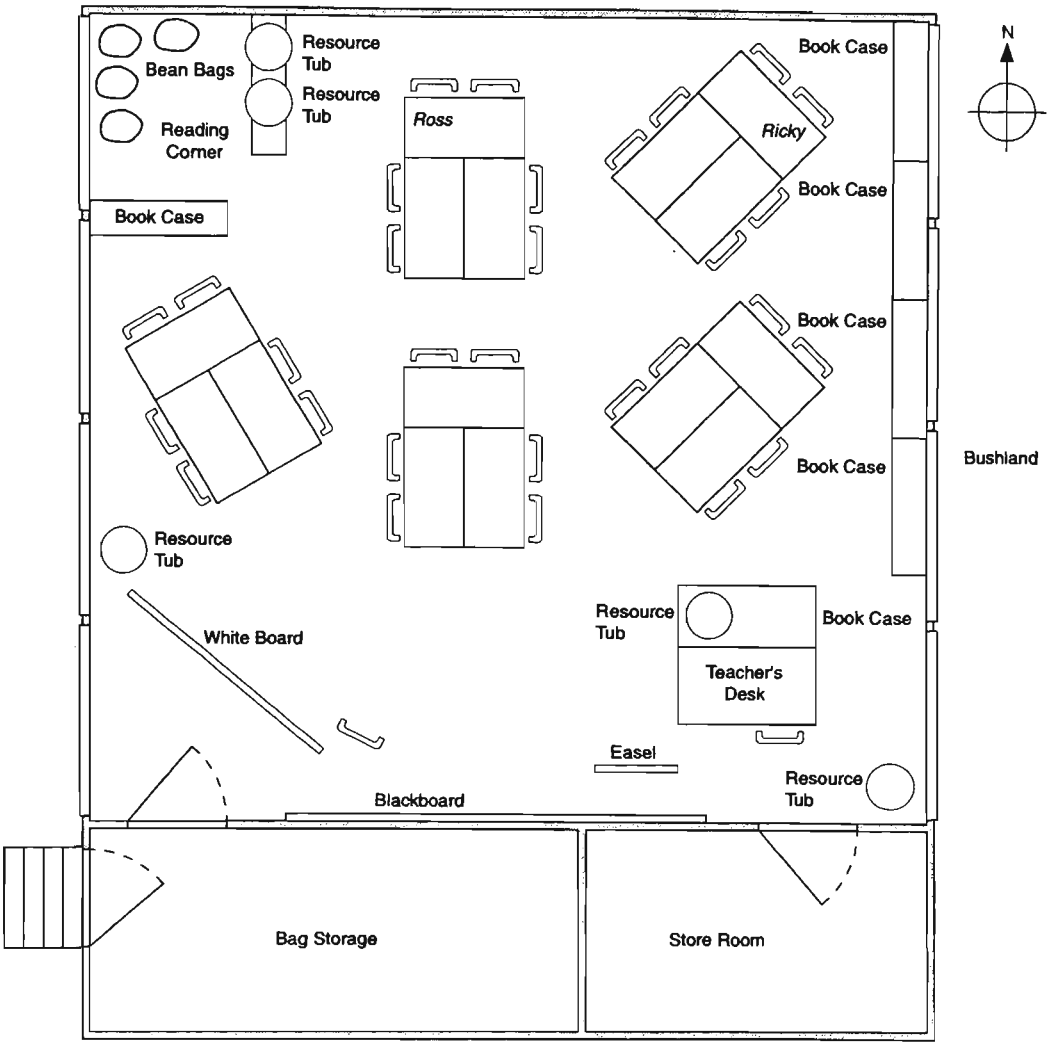

Figure 10.1. Plan of Ricky's Composite Classroom

The intensive reading room was arranged in a highly formal manner (see Figure 10.2). Each student was allocated a desk which would normally seat two students. Three students were seated one behind the other in each of two rows which were separated by a row of bookshelves. Students could not see over the shelves when in a seated position. Although one of these rows was beside an exterior wall with windows along its full length, the classroom looked onto a nature reserve and this rarely served as a distraction. A computer was placed behind a screen towards the back of the classroom. Two desks positioned together to one side of the classroom formed an area for group work when using the Language Master. This area was also used when the IR teacher worked individually with a student. A reading area with a number of beanbags occupied one corner.

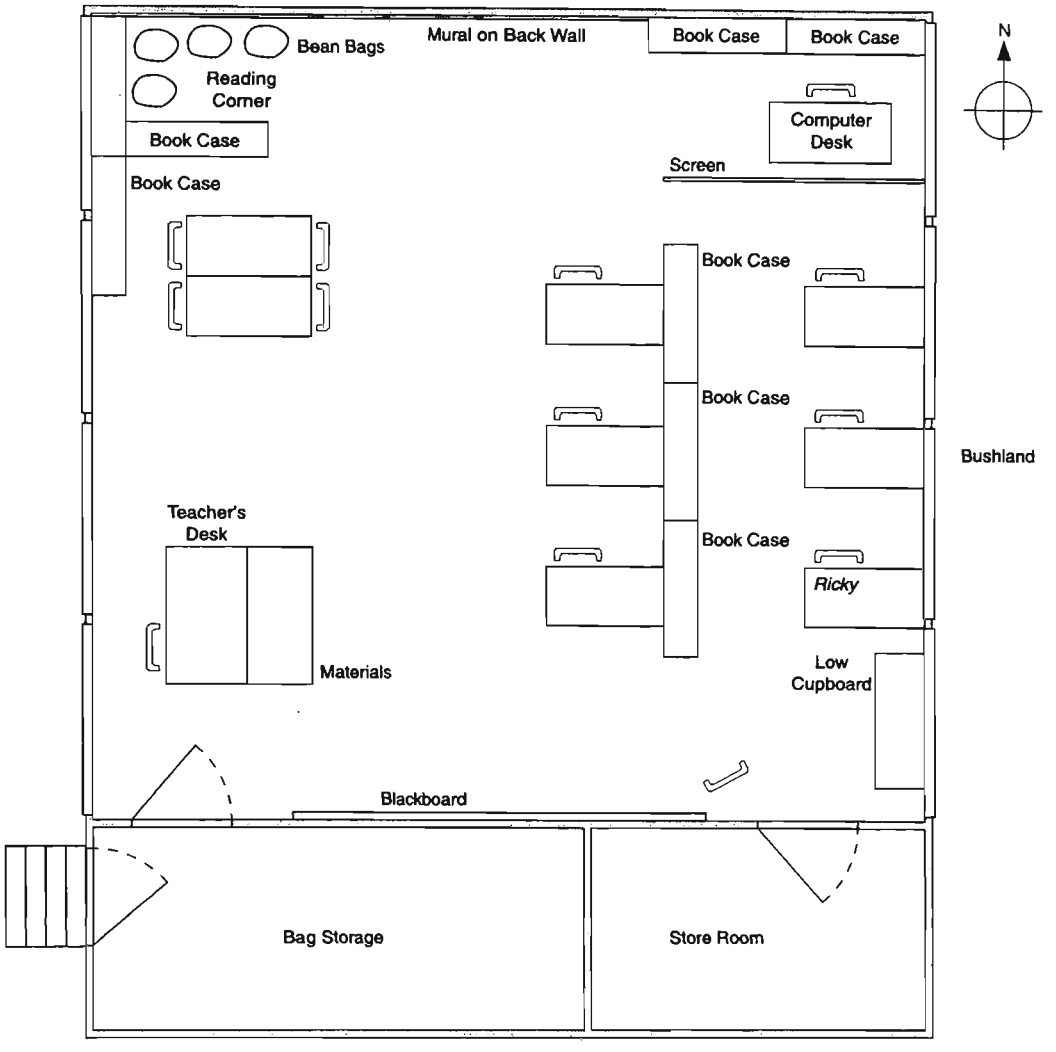

Figure 10.2. Plan of Ricky's Intensive Reading Room

Hilary had set up the reading room in this manner because

> children with ADHD can't afford to be the slightest bit distracted. I try to make sure they can't see any of the other students when they are meant to be working at their desks. Time is especially important in this room. I've only got twelve weeks to work on their reading and get them close to grade level, so I need their attention every minute. (teacher interview 13/12/96)

Rose was also aware of the recommendations to limit distractions. She said when she took over the class:

> I couldn't think of a better way to arrange the room and it's important that the children keep to their regular routine. (teacher interview 21/10/96)

Information from Table 10.5 (see columns 7 and 8 in relation to columns 5 and 6) suggests that greater levels of formality were related to higher percentages of TOT and AET.

10.3.4.ii Planned seating in relation to time on task and academic engaged time

According to the summarised information in Table 10.5, planned seating also appeared to be related to high percentages of TOT and AET. Column 8 reveals the extent to which each teacher purposefully placed the students with ADHD in particular seats within the classroom.

In Cheryl's classroom, Ricky was placed at the back of the room to *"limit his general impact on the class"* (informal post-observation interview, 6/8/96). During news sessions which were conducted on the floor at the front of the room, Ricky was also placed towards the back of the group. This rated "low" on the planned seating factor because, although there was a rationale to his placement, it considered only Ricky's impact on the class, rather than Ricky's needs also.

Cheryl was aware of the literature that mentioned that students with ADHD should be placed away from distractions but also believed that the rest of the class achieved more when he was positioned at the back of the room.

> He's at the back of the room because we couldn't cope with him near us at the front. I put him away from the door and the windows so there's less distraction, and he can't be anywhere near Ross because they really set each other off. He doesn't operate well with peers. (informal post-observation interview, 6/8/96)

Although officially sitting in the same position at a group of desks at the back of the room when Jacqui was teaching, Ricky occasionally sat in other seats which was not of concern to the teacher. Thus, her lessons were also rated as low on the planned seating factor.

In the Intensive Reading classroom planned seating was generally given a rating of high because all children were placed to limit distraction from others and from outside influences. One-to-one sessions took place away from the students' seats which again limited the distraction within the seatwork area. There were charts on the walls around the room and some teaching materials pegged to fishing line which ran across the room but these were well above the children's heads. The teacher was able to unhook certain sections of the fishing line which lowered the appropriate chart when needed in a particular lesson. The back wall had a large collage relating to reading themes which developed over the twelve week period in which each group participated in the Intensive Reading program.

Table 10.5

Organisation of the Physical Environment in Relation to Time on Task and Academic Engaged Time for Ricky

1 Ob No.	2 Teacher	3 LC	4 TD	5 TOT	6 AET	7 FS	8 PS
1	Cheryl	sp/lang acts	high	20%	17%	low	low
2	Cheryl	maths	high	12%	12%	low	low
3	Cheryl	diary writing	med	18%	18%	low	low
4	Cheryl	maths	high	20%	13%	low	low
5	Cheryl	handwriting	med	17%	17%	low	low
6	Cheryl	news	low	8%	n/a	low	low
7	Cheryl	maths	high	7%	7%	low	low
8	Cheryl	geometry	high	24%	22%	low	low
9	Cheryl	social science	med	0%	0%	low	low
				mean = 14%	mean = 13%		
10	Jacqui	maths	high	73%	60%	low	low
11	Jacqui	language	med	33%	27%	mod	low
12	Jacqui	craft	low	73%	20%	low	low
13	Jacqui	pers devt disc	low	59%	45%	mod	low
14	Jacqui	col worksheet	low	82%	67%	low	low
15	Jacqui	news	low	80%	40%	low	low
				mean = 67%	mean = 43%		
16	Hilary	aerobics perf	low	60%	n/a	low	low
17	Hilary	IR	med	100%	78%	high	high
18	Hilary	1:1counsel'g	low	100%	n/a	low	high
19	Hilary	IR	high	93%	73%	high	high
20	Hilary	IR	high	89%	85%	high	high
21	Hilary	IR	high	80%	22%	low	low
22	Hilary	IR	high	100%	99%	high	high
23	Hilary	IR	high	80%	57%	high	high
24	Hilary	IR	high	80%	63%	high	high
				mean = 87%	mean = 68%		
25	Rose	IR	med	80%	54%	high	high
26	Rose	IR	med	82%	78%	high	high
27	Rose	IR	med	72%	50%	mod	high
28	Rose	listen story	low	80%	13%	low	low
29	Rose	IR	med	80%	67%	mod	low
30	Rose	IR	med	63%	30%	low	low
31	Rose	IR	med	60%	45%	mod	high
32	Rose	IR	med	43%	27%	mod	high
				mean = 70%	mean = 46%		

Key

LC	lesson content	AET	academic engaged time
TD	task demand	FS	formality of setting
TOT	time on task	PS	planned seating

10.3.5 Managing behaviour of teacher in relation to time on task and academic engaged time for Ricky

Table 10.6 reveals how different aspects of the teachers' managing behaviours related to Ricky's time on task and academic engaged time.

10.3.5.i Monitoring behaviour and teacher redirects in relation to time on task and academic engaged time

Hilary's monitoring behaviour was rated as high most often, with the other three teachers' monitoring behaviour being more variable (see Table 10.6, column 7). The following extract (from Observation 19, 12/9/96) provides a typical example of Hilary's monitoring style:

> Teacher was working 1:1 with Andrew who was reading to her; Sally was on the computer and Kirstie and the three other boys, including Ricky, were working individually on their contracts.
>
> 12.49 Ricky approached the teacher for assistance and she directed Andrew to keep reading while she explained task to Ricky for approximately 90 seconds. She interrupted this on two occasions, once to say to Andrew, "*You blended that well*" and then to say, *"Good, you remembered that from yesterday"*.
>
> 12.51 Ricky returned to his seat and completed the activity, a word puzzle.
>
> 12.53 Ricky put his word puzzle in the marking tray and went to the board to tick off that activity.
>
> 12.55 Ricky approached Sally who had called to him for help at the computer. Kane also went to help Sally. They tried different methods to sort out the problem, discussing it amongst themselves.
>
> 12.56 Teacher directed Andrew to *"find all the 'sion' words on that page"*, then approached the computer area, saying, *"Back to your seats boys and keep on with your contracts. It's nearly time to count stamps"*. She then assisted Sally.
>
> 12.58 Ricky returned to his desk and continued doing another contract item.

1.00 The bell went but four of the six students continued finishing off their last activity (to accrue more stamps for completing contract items?)

Several different monitoring strategies have been encapsulated within this extract .

- Before assisting Ricky, Hilary told Andrew to keep reading, thereby keeping him on task.
- While assisting Ricky, she was also able to monitor Andrew's reading, to the point where she could reinforce strategies he was using, displaying what Kounin referred to as "withitness" (1977); the ability to attend to more than one classroom interaction simultaneously.
- When both Ricky and Kane were distracted by Sally's requests for help and they could not solve the problem quickly, the teacher directed the boys back to their own work before assisting Sally, thus ensuring that time on task for all the students was maximised. By doing things in this order she did not allow Sally's problem to become a lengthy time-waster for all of them.

Hilary explained her understanding of the importance of monitoring as follows:

> Ricky has to know that he will be accountable and that someone will check up on him. He's not yet at the stage where he can work unsupervised for long periods (teacher interview 13/12/96).

On only one occasion was Hilary's monitoring behaviour rated as low (see Observation 21, column 7). During this observation period Hilary was consulting with Rose (who was to take over the class when Hilary was on long service leave), explaining routines, where resources were located, and so on. The students were assisting in this process, being sent on messages, photocopying material, and so on. While Ricky was on task for 80% of the time in that he was doing what was requested of him, AET for this period was low as little time was allocated to formal lessons.

Jacqui's monitoring behaviour was variable (see Observations 10-15, column 7), however the effect of high levels of monitoring was clearly apparent during Observation 10 which scored a relatively high level of both TOT (73%) and AET (60%). The following extract will facilitate an explanation of this point.

11.11 Ricky approached teacher with finished work. She directed him to his table to finish an earlier activity. He discovered she had marked his book and he turned to show a peer a "Good work" sticker on his page. The teacher called to him to *"Sit down now, Ricky and finish your set (of maths exercises)"*.

11.12 He sat and wrote for approximately one minute then took the book out to the teacher. He sat on her chair while she worked on the floor with another student. He took a ball from the hands of another student in front of him. The teacher turned to him, removed the ball from his hand, put it in her pocket and marked his work. She then told him to *"Go back to your desk and look at number 5 again."* He returned to his desk, erased the incorrect answer, wrote another, put a pencil circle around it and took it back to the teacher. The teacher sent him back to his desk to get a red pen for marking. As he went, Ricky said, *"I'm up to date"*, to a peer, who responded *"On everything? Even maths?"* to which Ricky responded, *"Yup"*.

11.15 Ricky returned to front of room, dropped his book and started crawling around the other people on floor. Teacher was at board, writing. Peer looked through book and found some incomplete work which he tried to point out to Ricky. Teacher intervened and started a quick 5x table around the group in which they all participated.

11.17 Teacher said, *"We're marking page 73"* and asked a student the first answer. She looked at Ricky who was on the wrong page and directed a peer to show him. They then corrected the maths exercise together and Ricky gave a muted cheer for each one he got correct.

11.19 Ricky called out an answer when another student had been asked. Teacher ignored this and asked the original student

again. At the conclusion of that set Ricky said, "I only got one wrong." They began to mark another set.

11.21 Ricky was looking out the window. Teacher said *"Eyes to me"*. She then directed all the students to call out the answers together for the rest of the set.

11.25 Finished correcting. Ricky was on task although he was lying on the floor and kicking his legs in the air throughout most of the marking.

Jacqui's monitoring prevented several off-task behaviours developing into further loss of AET.

- She noticed when Ricky showed his sticker to a peer and was able to redirect him with specific instructions before he became too distracted.
- When Ricky took the ball while waiting for the teacher's attention, she simply took the ball from him and removed it from sight. She did not spend time telling him he shouldn't have done it. She then marked Ricky's work and immediately engaged him. (The peer seemed happy enough with this outcome. Following up this incident with the teacher later, she mentioned that removing it from everyone at the time was her policy and the student knew he would get it back at recess).
- When another peer wanted to point out incomplete work to Ricky the teacher moved on quickly to another activity which involved everyone.
- She noticed early in the marking procedure that Ricky was on the wrong page and was able to sort out the problem quickly which prevented further loss of AET.
- She ignored Ricky when he called out an answer inappropriately and didn't spend time reprimanding him.
- When she noticed his attention wandering after several minutes of marking she changed the response mode to choral responding which increased his participation and engaged him once more in the process.

Thus, a high level of monitoring prevented a great deal of potential loss of AET. Jacqui's understanding of the importance of monitoring was confirmed at interview when she stated:

> I have to stay quite physically close to him until he's under way and then I just keep an eye on him from then on so I can tell if his mind starts to wander. (16/12/96)

Cheryl's monitoring behaviour was variable (see Table 10.6, Observations 1 to 9, column 7). On some occasions when she moved around the room throughout seatwork her monitoring behaviour was rated as high. On other occasions she marked work with individual students while seated at her desk. When more than three children were lined up she was unable to see much of the rest of the classroom and so monitoring behaviour was considered to be low. This was so despite the fact that on at least two occasions of what was considered to be low monitoring, many redirects were aimed at Ricky. These occurred within short periods of time when she was attending to the class as a whole rather than spread evenly throughout the lesson. Ricky received considerably more individual redirections from Cheryl than from the other teachers.

Monitoring behaviour was high in the classrooms where the highest levels of TOT and AET were scored although some periods of low scoring were also monitored to a high degree. Teacher redirects were not related to high TOT or high levels of AET (see column 8 in relation to columns 5 and 6).

10.3.5.ii Use of direct language in relation to time on task and academic engaged time

The use of direct language was a feature of those teachers with whom Ricky scored higher levels of TOT and AET (see Table 10.6, column 9). There were clear differences in the use of language by the different teachers. Hilary's use of language was consistently rated as highly explicit (see Table 10.6, Observations 16 to 24, column 9). The actual words used to direct the boys to their seats in the previous extract (*"Back to your seat boys and get on with your contracts. It's nearly time to count stamps".*) gave precise information about what they were expected to do and reminded them of the motivational system she had in place.

Cheryl's use of direct language was not considered to be high. The following extract (from Observation 7) provided one example of the use of less explicit language and its effect:

> [The class was involved in independent seatwork following a mathematics demonstration. Ricky was talking in an animated fashion to Ross, the boy sitting next to him, and bouncing around on his chair. The teacher approached them and spoke to Ricky.]
>
> 11.50 *"How many minutes until 12 o'clock, Ricky?"* Ricky looked at his watch and said, *"Ten"*. Teacher then tapped the maths book in front of Ricky and said, *"That's when we're marking this work."* The teacher walked off and continued to monitor around the room. Ricky turned to Ross and said, *"Her watch must be broke"*, and continued chatting to him.

The implicit message for most students would be clear: "Stop talking. Hurry up and complete your work because we will be marking it soon." Ricky, however, interpreted this as a request for the time and assumed that the teacher's watch was broken. The

implied message is not clear at all to him: he made a very literal interpretation of this exchange. The message needed to be expressed in much more explicit terms for Ricky to interpret it correctly.

Cheryl's directions also tended to be expressed in the negative with few directions concerning what should have been happening. Thus, *"Stop that talking, Ricky"* (Observation 1) was a typical direction, but such directions were rarely followed up by an instruction or reminder concerning what he should be doing.

10.3.5.iii Positive interactions with target student in relation to time on task and academic engaged time

Ricky did not experience a high number of individual positive interactions within the observation periods although each teacher did interact in such a way at least once (see Table 10.6, column 10). This aspect of the classroom ecology did not appear to have any particular relationship with TOT or AET (see column 10 in relation to columns 5 and 6)

Ricky's relationship with each of his four teachers would, however, be regarded as warm. Each teacher expressed at different times genuine affection for Ricky. He was variously described by them as *'engaging'*, *'likable'*, *'irrepressible'*, and *'funny'* in addition to *'frustrating'*, *'infuriating'* and *'impossible to teach'*.

10.3.5.iv Evidence of routines in relation to time on task and academic engaged time

Table 10.6 revealed that the use of routines appeared to be associated with periods of high TOT and AET (see column 11 in relation to columns 5 and 6). There were considerable differences in the level of routines in place with each teacher. Routines were less evident in Cheryl's class (see Observations 1 to 9, column 11) and much more evident in the IR class with both teachers (see Observations 16 to 32).

Procedures for distributing, collecting and marking student work varied from lesson to lesson in Cheryl's room. There were some consistent procedures when students were involved in News sessions, therefore these lessons were rated as having moderate routines in place.

The IR class had routines in place for almost every activity. Availability of pencils, pens, rulers, and so on was checked early each morning. There were particular trays for marking, colour-coded according to type of activity. Every lesson involving a demonstration commenced with students going over the "Five Ls of Good Listening" before the demonstration began. The students did a "circuit" of activities each day, the particulars of which changed, but which broadly followed a particular sequence. On entry each morning, each child could determine what he or she would be doing by referring to the master table on the blackboard. Individual times with the teacher were also timetabled into each day so students knew when it would be their individual turn. Hilary confirmed her conscious use of routines and her belief in their importance:

> I spend the first two weeks teaching them the routines - it makes the next ten weeks manageable (teacher interview, 13/12/96).

In the extract recorded under **Monitoring behaviour and teacher redirects** (pp. 243-4 of this chapter), Ricky is aware of the routine for marking and places completed work in the appropriate tray rather than interrupting the teacher with it. The existence of routines for such procedures as collection and distribution of student work and materials does a great deal to minimise interruptions and off-task behaviour.

When the casual IR teacher took over responsibility for that class the existing routines were followed carefully in the early weeks although some modifications occurred as the weeks progressed. Rose's routines were less strong than Hilary's, being rated as moderate on the last four observations in that classroom, when her, rather than Hilary's, routines were in place (see Table 10.6, observations 23 to 32, column 11).

Table 10.6

Managing Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Ricky

1 Ob No.	2 T	3 LC	4 TD	5 TOT	6 AET	7 MB	8 TR	9 DL	10 PI	11 R
1	Cheryl	sp/lang acts	high	20%	17%	high	7	low	0	low
2	Cheryl	mathematics	high	12%	12%	high	6	low	0	low
3	Cheryl	diary writing	med	18%	18%	low	2	low	0	low
4	Cheryl	mathematics	high	20%	13%	low	5	low	0	low
5	Cheryl	handwriting	med	17%	17%	mod	4	low	0	low
6	Cheryl	news	low	8%	n/a	mod	1	low	1	mod
7	Cheryl	mathematics	high	7%	7%	high	5	low	0	low
8	Cheryl	geometry	high	24%	22%	low	13	mod	0	mod
9	Cheryl	social science	med	0%	0%	low	3	low	0	low
				mean = 14%	mean = 13%					
10	Jacqui	mathematics	high	73%	60%	high	4	high	2	mod
11	Jacqui	language	med	33%	27%	low	1	high	0	mod
12	Jacqui	craft	low	73%	20%	mod	1	mod	0	low
13	Jacqui	pers devt disc	low	59%	45%	mod	1	mod	2	mod
14	Jacqui	col worksheet	low	82%	67%	low	0	low	1	mod
15	Jacqui	news	low	80%	40%	mod	1	mod	0	mod
				mean = 67%	mean = 43%					
16	Hilary	aerobics perf	low	60%	n/a	low	1	high	0	low
17	Hilary	IR	med	100%	78%	high	2	high	0	high
18	Hilary	1:1 counsel'g	low	100%	n/a	n/a	?	?	?	n/a
19	Hilary	IR	high	93%	73%	high	1	high	3	high
20	Hilary	IR	high	89%	85%	high	2	high	1	high
21	Hilary	IR	high	80%	22%	low	0	high	0	high
22	Hilary	IR	high	100%	99%	high	0	high	0	high
23	Hilary	IR	high	80%	57%	high	1	high	2	high
24	Hilary	IR	high	80%	63%	high	1	high	1	high
				mean = 87%	mean = 68%					
25	Rose	IR	med	80%	54%	high	1	high	1	high
26	Rose	IR	med	82%	78%	high	1	high	2	high
27	Rose	IR	med	72%	50%	mod	1	mod	0	high
28	Rose	listen story	low	80%	13%	mod	3	mod	1	high
29	Rose	IR	med	80%	67%	high	1	high	0	mod
30	Rose	IR	med	63%	30%	mod	4	high	0	mod
31	Rose	IR	med	60%	45%	mod	3	mod	2	mod
32	Rose	IR	med	43%	27%	low	1	mod	1	mod
				mean = 70%	mean = 46%					

Key

T	teacher	TR	number of teacher redirects
LC	lesson content	DL	use of direct, explicit language
TD	task demand	PI	positive interactions with target student
TOT	time on task		
AET	academic engaged time	R	routines
MB	monitoring behaviour	?	data not observed or recorded

10.3.6 Instructional behaviour of teacher in relation to time on task and academic engaged time for Ricky

Table 10.7 reveals associations between Ricky's time on task and academic engaged time and the instructional behaviour of the teacher.

10.3.6.i Level of demonstrations in relation to time on task and academic engaged time

Higher average percentages of AET and TOT with moderate to high demand tasks appeared to be associated with lessons in which explicit demonstrations took place (see column 7 in relation to shaded areas of Table 10.7). All Hilary's demonstrations were classified as detailed and explicit and Ricky was consistently on task and academically engaged more often with Hilary than with the other teachers (see Observations 16 to 24). Jacqui and Rose also provided explicit instructions although these were not always associated with high AET. Cheryl provided less explicit demonstrations.

10.3.6.ii Level of task setting in relation to time on task and academic engaged time

Task setting was also more often explicit during periods of higher AET (see Table 10.7, column 8). Explicit demonstrations and task setting were regular features of Hilary's teaching (see Observations 16 to 24), and to a lesser extent of Rose's (see Observations 25 to 31). Hilary reported that the most significant factor in determining whether or not Ricky was able to remain on task was her ability to make the task clear to him and to structure the tasks so that it was at his functional level. In her words:

> What makes the difference is whether he (Ricky) knows what he has to do; whether he's understood the instructions. He needs short tasks at his instructional level. If you give him something too hard he just sits. He needs lots of guided practice. He also has to be successful which means it must be at his instructional level. And he has to be regularly reinforced. If it's been organised properly and

> has the correct amount of structure, he feels "safe" enough to do it. He has to feel that he can take the risk; that he'll probably get it right; that it's not too long; that he'll get something out of it. (teacher interview, 13/12/96)

Jacqui's task setting was less consistent. It appeared that there was a trend for more explicit demonstrations and task setting although with so few observations it was difficult to see a pattern in her teaching behaviour. She did say in her interview, however, that keeping Ricky on task was

> ...mainly being explicit in what you wanted him to do. (6/12/96)

Cheryl's task setting was considered to be generally less structured than the other teachers yet she too reported that:

> I generally am very explicit. I keep to routine as much as possible. I write instructions on the board. I don't give too many instructions at once. I know about that. I've got an LD child myself. He can't "read between the lines". You've got to spell it out. Quite often I would have to go to his desk after giving instructions and open the book at the right page for him. If I didn't he'd just draw through the whole lesson. He doesn't have a sense of what's important.
>
> With the majority of kids you could say, "Bring it out to me when you're finished", but with him you couldn't - you'd have to go to him.

Although Cheryl also expressed the belief that explicit task setting was important, her personal definition of the term may be somewhat different from some others. This perhaps has implications for teacher training and development that will be discussed further in Chapter Fourteen.

10.3.6.iii Direct teacher approach/assistance in relation to time on task and academic engaged time

Hilary directly approached or assisted Ricky more often on average than any of his other three teachers (see Table 10.7, column 9). Although this would be far easier in a class of six it was noted that Rose did not do this as often with the same class numbers. There did not appear to be a direct relationship between direct teacher assistance and high levels of TOT and AET for specific lessons with each of Ricky's four teachers (see column 9 in relation to columns 5 and 6). It was clear, however, that when in Hilary's class Ricky was much more on task and engaged and that direct teacher assistance was a regular occurrence when in her classroom.

10.3.6.iv Maintenance of momentum in relation to time on task and academic engaged time

Table 10.7 (column 10) records an assessment of the momentum during each observation period based on the decision rules detailed in Chapter Seven. Factors such as external interruptions, transitions from one part of a lesson to the next and ceasing a demonstration in order to redirect were considered when assessing the overall momentum of a lesson.

Momentum in Cheryl's class was almost always calculated as low. The number of times Cheryl stopped to redirect Ricky (and also another student who was regularly off task) greatly affected the momentum of the class. There were also many occasions when Cheryl needed to clarify procedures. In the same classroom Jacqui maintained a higher level of momentum.

Table 10.7 reveals that Hilary maintained a higher level of momentum on a consistent basis and that this was associated with higher levels of TOT and AET (see Observations 16 to 24, column 10). The momentum in Rose's room was variable. One student

caused significant difficulty for Rose on several occasions. The student had formed a very strong relationship with Hilary and found the change of teacher more difficult to manage than did the other students. She was often negative and oppositional and on those occasions the general momentum of the class was affected if group instruction was being undertaken. Fortunately the students were often individually engaged with their own contracts and the AET of most students was not affected.

10.3.6.v Frequency and type of feedback in relation to time on task and academic engaged time

The frequency of task-related feedback was highest in Hilary's classroom as was the frequency of process feedback (see Table 10.7, Observations 16 to 24, columns 11 and 12). When providing feedback to Ricky, Hilary nearly always specified exactly what was correct or incorrect rather than saying simply "Good work" or "Well done". These factors were associated with higher percentages of TOT and AET (see columns 11 and 12 in relation to column 6). In contrast to this, Cheryl's feedback often consisted of comments such as *"That's not finished yet. Hurry up"* (Observation 3) and *"Keep going"* (Observation 7) which did not fit within the definition of process feedback.

Table 10.7

Instructional Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Ricky

1 Ob No.	2 T	3 LC	4 TD	5 TOT	6 AET	7 Dem	8 TS	9 TAA	10 MM	11 FF	12 PF
1	Cheryl	sp/lang acts	high	20%	17%	low	low	5	low	high	low
2	Cheryl	maths	high	12%	12%	med	low	0	low	low	low
3	Cheryl	diary writing	med	18%	18%	n/a	low	1	low	mod	low
4	Cheryl	maths	high	20%	13%	low	low	0	low	mod	low
5	Cheryl	handwriting	med	17%	17%	low	low	0	low	low	low
6	Cheryl	news	low	8%	n/a	n/a	n/a	0	mod	low	low
7	Cheryl	maths	high	7%	7%	low	low	2	low	low	low
8	Cheryl	geometry	high	24%	22%	low	low	1	low	mod	low
9	Cheryl	social science	med	0%	0%	low	low	0	low	low	low
				mean = 14%	mean = 13%						
10	Jacqui	maths	high	73%	60%	high	high	3	high	high	high
11	Jacqui	language	med	33%	27%	high	low	1	mod	mod	mod
12	Jacqui	craft	low	73%	20%	mod	mod	1	mod	low	low
13	Jacqui	pers devt disc	low	59%	45%	n/a	mod	1	high	high	high
14	Jacqui	col worksheet	low	82%	67%	low	low	0	high	low	low
15	Jacqui	news	low	80%	40%	n/a	mod	1	high	mod	low
				mean = 67%	mean = 43%						
16	Hilary	aerobics perf	low	60%	n/a	high	high	3	mod	high	high
17	Hilary	IR	med	100%	78%	high	high	3	high	high	high
18	Hilary	1;1counsel'g	low	100%	n/a	n/a	n/a	?	?	?	?
19	Hilary	IR	high	93%	73%	high	high	2	high	high	high
20	Hilary	IR	high	89%	85%	high	high	5	high	high	high
21	Hilary	IR	high	80%	22%	low	mod	5	low	mod	mod
22	Hilary	IR	high	100%	99%	high	high	4	high	high	high
23	Hilary	IR	high	80%	57%	high	high	2	high	high	high
24	Hilary	IR	high	80%	63%	high	high	3	high	high	high
				mean = 87%	mean = 68%						
25	Rose	IR	med	80%	54%	high	high	1	mod	high	high
26	Rose	IR	med	82%	78%	high	high	2	mod	high	high
27	Rose	IR	med	72%	50%	high	mod	1	low	low	low
28	Rose	list story/I R	low	80%	13%	low	mod	0	mod	mod	mod
29	Rose	IR	med	80%	67%	low	high	1	mod	low	low
30	Rose	IR	med	63%	30%	high	mod	2	low	mod	mod
31	Rose	IR	med	60%	45%	low	mod	0	mod	mod	mod
32	Rose	IR	med	43%	27%	low	low	0	low	low	low
				mean = 70%	mean = 46%						

Key

T	teacher	TS	level of task structure
LC	lesson content	TAA	teacher approached/assisted
TD	task demand	MM	level of momentum
TOT	time on task	FF	frequent feedback
AET	academic engaged time	PF	process feedback
Dem	teacher demonstration	?	data unavailable or not recorded

10.4 SUMMARY OF DATA RELATING TO RICKY

Ricky's TOT and AET measures were different with each of his four teachers. Higher ratings on both measures were achieved when in the IR class, although Ricky scored comparable measures when with Rose in the IR class and when with Jacqui in the composite classroom. This suggests that the larger class size and multi-focus nature of a regular composite classroom were not the major determining factors in Ricky's ability to remain on task, because Jacqui had similar success in keeping Ricky on task as did Rose in what would be considered much more "favourable" conditions. Jacqui also had far greater success in keeping Ricky on task than Cheryl under similar classroom conditions.

Higher levels of TOT and AET on medium to high demand tasks occurred when in the IR class with Hilary.

There was a higher incidence of ADHD-related behaviours when in Cheryl's class than when in the IR class. Ricky interacted positively with his peers and approached the teacher in all class settings but this appeared to occur slightly more often in Hilary's class. Interfering behaviours occurred more often in Cheryl's class, possibly because of the greater intensity of the hyperactivity and impulsive behaviours which were also noted in that classroom. Like James, Ricky appeared to use self-talk strategies when engaged.

Ricky received negative feedback from his peers but not when he was on task or academically engaged. This appeared to be an added benefit of engaged behaviour.

Greater formality in the classroom setting appeared to be associated with higher levels of TOT and AET. From these results it also appeared that higher AET and TOT were associated with high levels of monitoring, direct language and strong routines. It did

not appear that the number of teacher redirects or positive interactions was of particular significance.

In terms of teacher instructional behaviour, the use of structured demonstrations and explicit task setting was associated with higher levels of TOT and AET. Teacher assistance also occurred with high measures of both, but not exclusively. The maintenance of momentum and the frequent use of process feedback also occurred when higher levels of TOT and AET were recorded.

10.5 EMERGING TRENDS

Ricky's behaviour changed quite dramatically within short periods of time in different classroom settings, reflecting Bronfenbrenner's (1979) belief that individual factors alone are only one element affecting the environment. These findings suggest that other aspects of the classroom ecology effected major changes in Ricky's behaviour. Factors associated with teacher management and teacher instructional behaviour appeared to have a major impact on Ricky's ability to remain on task or academically engaged.

Ricky was more motivated to complete set tasks and was far less likely to become distracted in Hilary's rather than in the other classes. Thus, more of the learning activities in her classroom could be classified as molar activities, and therefore more likely to result in successful learning outcomes. Ricky was more able to successfully fulfil his role as "student" in Hilary's class because the characteristics of her classroom facilitated that process. Simultaneously, classroom elements were such that Hilary's role as "teacher" was more easily played.

There were more features of a developmental dyad in the relationship between Ricky and Hilary than between Ricky and any other of the teachers. There was a greater sense of common goals and agreement on how those goals were to be achieved. This is

reflected in Ricky's ability to remain on task and academically engaged more often with Hilary than with any of the other teachers. These points will be explored further in the Chapter Thirteen, where significant findings from all target students will be discussed.

In this chapter, findings relating to Ricky with each of his four teachers have been reported. Wide differences were found in his ability to remain on task and academically engaged. In the next chapter, findings relating to Mitchell, the fourth of the target students, have been reported.

CHAPTER ELEVEN

FINDINGS RELATED TO MITCHELL

In this chapter, findings relating to Mitchell are presented. Mitchell was one of five students with ADHD in the same Year 4 class. Three of the other four students also took part in the study but comprehensive data could not be collected on four students simultaneously, therefore detailed findings on the other three students have not been presented.

11.1 BACKGROUND INFORMATION ON MITCHELL

Aged 9.2 at the commencement of the observation period, Mitchell is the third of four children in a single parent family. His older brother and sister are both in their early twenties and do not live with the family. He has a sister three years younger than he who has also been diagnosed with ADHD.

11.1.1 Early development

Mitchell's hyperactivity and impulsivity were evident from a very young age. Once he was mobile, his mother reported, *"you had to have eyes in the back of your head just to keep him alive"* (parent interview 23/8/96). He constantly pulled things apart, upset food, broke toys, and engaged in dangerous activities. He had *"so much enthusiasm"*, was *"always making things"* and *"wanting to know how things worked and what made things go"* (parent interview 23/8/96). He enjoyed watching cartoons and action movies on television. He also enjoyed playing computer games when he had access to them.

11.1.2 Diagnosis of ADHD

Mitchell was first referred for assessment after his Year 1 teacher expressed concern about his high level of distractibility and hyperactivity. Due to a number of domestic factors recommendations for assessment for ADHD were not followed up until the end of Year 3 when the diagnosis of ADHD (combined type) was confirmed.

11.1.3 Cognitive level and academic progress

Assessment by the school counsellor when Mitchell was in Year One resulted in a scaled IQ score of 127 (verbal score 133) on the Wechsler Intelligence Scale for Children (3rd Edition) (Wechsler, 1991) with the added comment that this score was very likely suppressed by his highly distractible and inconsistent behaviour throughout the assessment. Mitchell's classroom behaviour and academic progress continued to cause concern for his teachers in Years 1, 2 and 3. After assessment by an independent clinical psychologist at the end of Year 3 (who also diagnosed the ADHD), Mitchell's verbal IQ was recorded as 117 and performance IQ as 103.

Mitchell scored in the bottom 10% in every subject in the final examinations of the observation year and he scored zero on two test papers. His progress in relation to his peers had declined with each year of schooling.

11.1.4 Relationships between home and school

Although caring greatly for her children, Mitchell's mother had limited financial and emotional resources. These facts, in addition to a lack of social support networks, meant that Mitchell's home life was unstable and at times quite chaotic. His mother was not able to provide a great deal of practical support in managing Mitchell's home environment but greatly valued the effort that his teacher and the school put into trying

to manage Mitchell's behaviour. She was particularly appreciative of the occasional notes sent home by Mitchell's teacher when Mitchell achieved something at school.

11.2 CONCEPTUAL ISSUES HIGHLIGHTED BY FINDINGS RELATED TO MITCHELL

Significant issues which emerged from the data relating to Mitchell included the following:

- the effects of ADHD-type behaviours on the task engagement of all students;
- the relationship between set tasks and student interest and ability level;
- the relationship between setting characteristics and task engagement;
- the relationship between classroom management and task engagement;
- the relationship between instructional strategies and task engagement; and
- the relationship between the affective climate of the classroom and task engagement.

11.3 TABULATED DATA FROM CLASSROOM OBSERVATIONS

Table 11.1 provides an overview of the 31 classroom observations of Mitchell, showing relationships between time on task, academic engaged time, day and time of observation, lesson content, minutes of observation and task demand.

11.3.1 Task characteristics, time on task and academic engaged time

Mitchell's average TOT was 24% with AET calculated as 19%. On low demand tasks his average AET was 17%, on medium demand tasks AET was 20% and on high demand it was 11%. This follows the trend predicted by Krupski (1985) who found in her research that students with attention difficulties had less difficulty remaining on task with low demand activities.

During morning observation periods Mitchell scored an average AET of 22% while during afternoon observations periods he scored an average of 10% which demonstrated some preference for morning activity.

Considering Mitchell's very low average for both AET and TOT his score of 100% for both measures during one particular observation period is particularly noteworthy. This was silent reading of free choice material. Mitchell read and looked through a large, illustrated text titled *"Countries of the World"* (author and publication details not recorded). This book clearly engaged him immediately and maintained his close attention for the entire 15 minute period.

During an earlier silent reading period of free choice material (Observation 11) both TOT and AET had been assessed as 0%. Silent reading periods were therefore not always conducive to engagement. One possible explanation of the 0% score is that that particular observation period had followed an incident in the morning assembly when Mitchell had been withdrawn from the school assembly for *"disturbing everyone around him"* according to the teacher who withdrew him. Mitchell was quite subdued during the following reading period. He spent the time drawing pictures in a book, erasing from another book, chewing his jumper, playing with small pieces of paper and writing on the board. At one point he wandered briefly around the room, picking up different books and discarding them. The teacher mentioned later that she did not try to redirect him because as long as he was not interfering with anyone else she could tolerate that behaviour and if he was feeling out of sorts after the assembly incident it may be better to *"let sleeping dogs lie"* (post observation interview, 20/9/96). Clearly individual factors within Mitchell contributed greatly to the extent to which he was able to engage in a task even when offered total choice of activity.

Another period of high AET related to an information session on Macedonia conducted by members of the local Macedonian community. Students had the option to choose

from a number of information sessions relating to different countries. Mitchell was engaged throughout his choice of the Macedonian information session. The only time lost was in moving to the appropriate area.

The only other period of high TOT involved listening to a story. As Mitchell's periods of on-task behavior are so infrequent analysis of any period of high engagement is important. These periods will be further analysed as other aspects of Mitchell's learning environment are discussed.

In response to the question concerning what factors she believed contributed most to whether Mitchell remained on task or not, his teacher said:

> With Mitchell it's mainly his mood - and maybe the time of day. He's better in the morning. Sometimes it depends on what we do. He really enjoys creative writing - once he wrote for 20 mins. He enjoys art too but he's never happy with the results of his artwork. He often asks to do things again - he can't seem to meet his own expectations, and then he gets very frustrated - genuinely upset. He doesn't seem to learn from experience or retain anything. (teacher interview, 5/12/96)

Mitchell scored consistently low percentages on measures of time on task and academic engaged time throughout regular class activity. Mitchell's teacher strongly believed that all students, but particularly bright students, functioned best when given some autonomy in the classroom. She admitted feeling *"highly ambivalent"* towards Mitchell because he *"challenges everything I believe about how learning occurs"* (interview 5/12/96). Mitchell's few periods of high engagement appeared to be unrelated to classroom variables.

Issues related to the match between learning tasks and student interest and ability levels appear to be relevant in discussion of data collected in Mitchell's classroom. Lessons

classified as poetry could perhaps have been more realistically described as copying or handwriting tasks in that they consisted chiefly of a brief discussion of a poem followed by instructions to copy out the poem from an overhead transparency. Tasks of this nature would not be classified by Bronfenbrenner (1979) as *molar* activities and were unlikely to motivate a student of above average ability.

In the same classroom Toby, who had been integrated from a class for students with mild intellectual disabilities, rarely engaged in classroom activity. No adaptions or curriculum modifications were made for a student who was operating below Year 4 level. This lack of match between student level of ability and the task appeared to have significant effects on levels of time on task and academic engagement for both students.

Table 11.1

Task Characteristics in Relation to Time on Task and Academic Engaged Time for Mitchell

1 Ob No.	2 D/T	3 LC	4 M/O	5 TM	6 TD	7 TOT	8 AET
1	Tues m	maths-practical	30	med	med	13%	0%
2	Thurs mm	editing	20	low	high	7%	7%
3	Mon aft	creative writing	40	low	high	11%	9%
4	Tues m	cut/paste/colour	30	low	low	14%	n/a
5	Tues mm	ind reading activ's	40	low	high	23%	10%
6	Wed aft	handwriting	30	low	med	27%	20%
7	Tues aft	maths revision	34	med	med	12%	9%
8	Fri m	news	10	med	low	60%	30%
9	Fri mm	maths-practical	30	med	med	30%	30%
10	Fri aft	copying; drawing	30	low	med	13%	7%
11	Mon m	silent reading	15	high	med	0%	0%
12	Mon m	indiv spell activ's	28	low	med	18%	14%
13	Mon aft	personal devt	5 #	low	low	0%	0%
14	Mon aft	personal devt	7 #	low	low	0%	0%
15	Tues aft	story listening	15	high	low	80%	n/a
16	Mon aft	maths exercises	15	med	high	13%	13%
17	Tues aft	*library	30	low	low	0%	0%
18	Wed aft	story listening	10 #	low	low	0%	n/a
19	Tues mm	maths exercises	50	med	high	10%	4%
20	Thurs m	silent reading	15	high	med	100%	100%
21	Thurs m	spell activities	30	low	med	13%	13%
22	Wed aft	catchup acts	50	low	med	26%	11%
23	Mon aft	copying poem	20	low	med	40%	30%
24	Thurs m	*multicult speak	30	high	low	90%	73%
25	Tues mm	maths/proc text	40	med	high	30%	15%
26	Tues mm	handwriting	15	low	med	0%	0%
27	Wed m	maths testing	40	low	high	10%	10%
28	Wed mm	craft	30	med	low	63%	n/a
29	Thurs mm	reading activities	30	low	high	27%	20%
30	Mon aft	peer support	30	low	low	0%	0%
31	Thurs aft	science	35	med	med	20%	20%
			total = 834			mean = 24%	mean = 19%

Key

Ob No.	observation number	TD	task demand
D/T	day and time	TOT	time on task
LC	lesson content	AET	academic engaged time
M/O	minutes of observation	*	lesson not taught by class teacher
TM	task match	#	Mitchell exited from room

11.3.2 Target student (Mitchell) behaviour in relation to time on task and academic engaged time

Table 11.2 presents time on task and academic engaged time in relation to Mitchell's behaviour. This revealed the extent to which Mitchell's individual behaviour contributed to the ecology of the classroom.

11.3.2.i Evidence of ADHD characteristics in relation to time on task and academic engaged time

Table 11.2 reveals that Mitchell was rated in the high range for difficulties in the areas of attention, impulsivity and hyperactivity for most lessons, indicating that these characteristics were evident for a large proportion of his class time (see columns 7, 8 and 9).

Mitchell's behaviour typified that of the ADHD student. His body was in constant motion, he left his desk repeatedly, he rocked on his chair, he continually interfered with other students by taking their belongings or interrupting them, he rarely finished set tasks, he made irrelevant comments in a loud voice, he interrupted the teacher repeatedly, he fiddled and played with items on his desk and around the room, and he was unable to maintain attention to task for more than a few seconds. He dominated the teacher's attention in most lessons. On the few occasions when he scored comparatively high levels of TOT or AET, ADHD-type characteristics were categorised as moderate or low (see columns 5 and 6 in relation to columns 7, 8 and 9).

Mitchell's teacher was aware that he spent very little time on task and that his behaviour was characteristic of a student with ADHD. Examination of Tables 11.1 and 11.2 support this comment as Mitchell records very low average time on task and academic engaged time. Mitchell's teacher's comments on his usual classroom behaviour were as follows:

> He's very disruptive, always moving around the room. He was flitting around the place even when he was meant to be doing his yearly (exam). He's very impulsive - he spoils things because he just won't take the time... one to one he's fine but how often can I do that. He's very attention-seeking. (teacher interview, 5/12/96)

Mitchell's teacher was also aware that he completed minimal amounts of work and was not achieving to his level of ability in her classroom unlike several other bright and self-motivated children in her class who responded well to her management and instructional style. The fact that Mitchell was not learning effectively was very apparent to her but she maintained her strong beliefs concerning how children should be managed in the classroom:

> He used to perform at about an average level, but that's definitely underachieving for Mitchell. He has a good general knowledge - loves documentaries – and he has a good vocabulary. He hasn't developed writing skills. He's not putting in enough effort or time. Things have gone from bad to worse. He hardly scored at all in his yearly maths test. He hardly did any of it. He's got the highest IQ in the class and he'll probably come last in the assessment results.
>
> He's bright and he should be able to focus on things more. There's everything he needs here – he could be doing some great work. The other bright ones certainly don't need standover tactics. They should be able to organise themselves. (teacher interview, 5/12/96)

11.3.2.ii "Approaching teacher" behaviour in relation to time on task and academic engaged time

Mitchell often approached his teacher for assistance, although not in every lesson (see column 10). This was usually to seek clarification of what he should be doing. Often he would not physically approach the teacher but would call out from wherever he was. This did not appear to assist him in remaining on task (see column 10 in relation to columns 5 and 6).

11.3.2.iii "Initiating interaction with peers" in relation to time on task and academic engaged time

Mitchell initiated interaction with his peers on a regular basis (see column 11) although only occasionally at an appropriate time or in a positive way. He was often a source of entertainment but he tended to put on a general performance for the class rather than approach an individual.

When positive interactions occurred twice within a single observation (Observation 24) Mitchell was involved in the discussion about Macedonia and initiated relevant discussion with a peer on two occasions.

11.3.2.iv "Interfering with peers" in relation to time on task and academic engaged time

Table 11.2 (column 12) reveals that Mitchell regularly interfered with his peers, often many times within a single observation. In the creative writing lesson (Observation 3), the teacher left the classroom for 14 minutes. During that period, in addition to goose-stepping around the room and throwing pieces of paper into the bin from varying distances, he removed paper and pens from students' hands, interrupted conversations between peers and directly interfered with at least six students who were on task.

Throughout Observation 29 when he was recorded as having interfered with his peers 12 times (see column 12), the class was doing different reading activities. Mitchell's task was to answer questions from a reading card. Mitchell spent a large part of the time putting the card on his head and moving around the room in "catwalk" fashion, tripping over schoolbags and accidentally knocking items off desks. He also used the card to fan himself and others. He made many exaggerated fanning motions which resulted in his hitting a number of other students.

On two occasions (Observations 13 and 14), Mitchell was exited from the room after only a few minutes of lesson time. These were personal development lessons, the first of which was aimed at differentiating between "good touching" and "bad touching". Mitchell made a number of inappropriate comments on the first occasion and was sent from the room after only five minutes. A week later he was once again removed from the personal development class for similar behaviour. In a follow up discussion with him outside the principal's office, he said, *"I just can't help it. The words are out of me before I know"* (9/9/96). On another occasion when discussing the number of times he gets into trouble he reported, *"I just forget. She (class teacher) says, 'Don't rock on your chair', and I forget straight away and just do it"* (16/10/96). Comments like, *"But I just can't help it"* (24/10/96), *"I forget straight away what I'm meant to be doing"* (15/11/96) and *"My body seems to do things without me even knowing about it"* (12/12/96) seem to reflect his genuine distress at the difficulties he experiences in the classroom. There is also perhaps some level of awareness regarding his own inability to regulate the undesirable behaviours or to remember teacher directions.

11.3.2.v "Imitating peer behaviour" in relation to time on task and academic engaged time

Mitchell was observed imitating peer behaviour on only one occasion (Observation 12, see column 13). When directed to *"write down some personal spelling words"*, he looked through several class library books to find some after observing another boy do this. Unlike the younger boys, his first port of call for help was the teacher. With only one incident of imitating peer behaviour, it was impossible to make a judgement about whether or not this assisted on-task behaviour.

Table 11.2

Target Student (Mitchell) Behaviour in Relation to Time on Task and Academic Engaged Time

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 ATT	8 IMP	9 HYP	10 AT	11 IIP	12 IP	13 ImP
1	maths-practical	30	med	13%	0%	high	high	high	2	0	5	-
2	editing	20	high	7%	7%	high	high	high	2	0	6	-
3	creative writing	40	high	11%	9%	high	high	high	0	0	10	-
4	cut/paste/col	30	low	14%	n/a	high	mod	high	3	0	4	-
5	ind reading acts	40	high	23%	10%	high	high	high	2	1	4	-
6	handwriting	30	med	27%	20%	high	high	high	3	0	1	-
7	maths revision	34	med	12%	9%	high	high	high	2	0	4	-
8	news	10	low	60%	30%	mod	mod	mod	2	0	2	-
9	maths-practical	30	med	30%	30%	high	high	high	0	0	3	-
10	copying; drawing	30	med	13%	7%	high	high	high	2	0	3	-
11	silent reading	15	med	0%	0%	high	high	high	0	0	0	-
12	ind spell activ's	28	med	18%	14%	high	high	high	3	1	2	1
13	personal devt	5 #	low	0%	0%	high	high	high	n/a	0	n/a	-
14	personal devt	7 #	low	0%	0%	high	high	high	n/a	0	n/a	-
15	story listening	15	low	80%	n/a	low	low	mod	0	0	0	-
16	maths exercises	15	high	13%	13%	high	high	high	1	0	4	-
17	*library	30	low	0%	0%	high	high	high	0	0	3	-
18	story listening	10 #	low	0%	n/a	high	high	high	0	0	4	-
19	maths exercises	50	high	10%	4%	high	high	high	4	0	4	-
20	silent reading	15	med	100%	100%	low	low	low	0	0	0	-
21	spell'g activities	30	med	13%	13%	high	high	high	3	1	4	-
22	catchup activ's	50	med	26%	11%	high	high	high	1	1	3	-
23	copying poem	20	med	40%	30%	high	high	high	1	0	1	-
24	*multicult speak	30	low	90%	73%	low	low	mod	1	2	2	-
25	maths/proc text	40	high	30%	15%	high	high	high	0	0	2	-
26	handwriting	15	med	0%	0%	high	high	high	1	0	6	-
27	maths testing	40	high	10%	10%	high	mod	mod	2	0	3	-
28	craft	30	low	63%	n/a	high	high	high	2	0	6	-
29	read'g activities	30	high	27%	20%	high	high	high	n/a	1	12	-
30	peer support	30	low	0%	0%	high	high	high	0	0	1	-
31	science	35	med	20%	20%	mod	mod	mod	0	1	2	-
		total = 834		mean = 24%	mean = 19%							

Key

LC	lesson content	HYP	hyperactivity evident
M/O	minutes of observation	AT	approached teacher
TD	task demand	IIP	initiated positive interaction with peer
TOT	time on task	IP	interfered with peer
AET	academic engaged time	ImP	imitated peer behaviour
ATT	attention difficulties	*	lesson not taught by class teacher
IMP	impulsivity evident	#	Mitchell exited from room

11.3.2.vi Other behaviours occurring with time on task and academic engaged time

Mitchell's TOT was high throughout Observation 15, when the class teacher was reading a story. Mitchell was lying on the floor on his stomach. He moved his lower legs up and down almost continuously for the fifteen minutes of the observation. This was the only time he was observed doing this and it was noted that it occurred during one of his few periods of on-task behaviour. It was similar to Ricky's behaviour when marking on the floor. Mitchell's class teacher, when questioned about this afterwards, said she had not noticed this behaviour previously (as one of Ricky's teachers had). It certainly did not occur during all story-telling periods (see Observation 18 for comparison).

11.3.3 Peer behaviour in relation to time on task and academic engaged time for Mitchell

Table 11.3 (column 9) demonstrates the extent to which Mitchell received negative responses from his peers.

Often Mitchell's peers would find him entertaining but occasionally his behaviour was met with groans of frustration, physical retaliation (when he took belongings or interrupted work or games) and/or reporting of his behaviour to the class teacher. Mitchell received relatively few negative responses from his peers considering the level of disruption he caused in the classroom and the number of times he directly interfered with them.

The difficulties he had with his peers was also acknowledged by his teacher:

> He was in a group for group work and he wanted to be there so badly but he just couldn't cope. Socially he can't achieve. He linked up with Toby (another isolate)...gradually the class has become less tolerant (teacher interview, 5/12/96).

Negative responses from peers did not occur on those few occasions when TOT and AET percentages were 70% or higher (see column 9 in relation to columns 5 and 6).

Table 11.3

Peer Behaviour in Relation to Time on Task and Academic Engaged Time for Mitchell

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 IIP	8 IP	9 NP
1	maths-practical	30	med	13%	0%	0	5	1
2	editing	20	high	7%	7%	0	6	6
3	creative writing	40	high	11%	9%	0	10	1
4	cut/paste/colour	30	low	14%	n/a	0	4	0
5	ind reading activities	40	high	23%	10%	1	4	0
6	handwriting	30	med	27%	20%	0	1	0
7	maths revision	34	med	12%	9%	0	4	0
8	news	10	low	60%	30%	0	2	0
9	maths-practical	30	med	30%	30%	0	3	0
10	copying; drawing	30	med	13%	7%	0	3	0
11	silent reading	15	med	0%	0%	0	0	0
12	ind spelling activities	28	med	18%	14%	1	2	1
13	personal devt discussion	5 #	low	0%	0%	0	n/a	n/a
14	personal devt discussion	7 #	low	0%	0%	0	n/a	n/a
15	story listening	15	low	80%	n/a	0	0	0
16	maths exercises	15	high	13%	13%	0	4	2
17	*library	30	low	0%	0%	0	3	1
18	story listening	10 #	low	0%	n/a	0	4	0
19	maths exercises	50	high	10%	4%	0	4	0
20	silent reading	15	med	100%	100%	0	0	0
21	spelling activities	30	med	13%	13%	1	4	1
22	catchup activities	50	med	26%	11%	1	3	1
23	copying poem	20	med	40%	30%	0	1	0
24	*multicult speaker	30	low	90%	73%	2	1	0
25	mathematics/proc text	40	high	30%	15%	0	2	0
26	handwriting	15	med	0%	0%	0	2	0
27	maths testing	40	high	10%	10%	0	2	0
28	craft	30	low	63%	n/a	0	3	0
29	reading activities	30	high	27%	20%	1	6	0
30	peer support	30	low	0%	0%	0	12	2
31	science	35	med	20%	20%	ext	1	0
		total = 834		mean = 24%	mean = 18%			

Key

LC	lesson content	IIP	initiated positive interaction with peer
M/O	minutes of observation	IP	interfered with peer
TD	task demand	*	lesson not taught by class teacher
TOT	time on task	#	Mitchell exited from room
AET	academic engaged time		

11.3.4 Organisation of the physical environment in relation to time on task and academic engaged time for Mitchell

Table 11.4 demonstrates the relationship between time on task, academic engaged time and aspects of the physical environment. The various components of the physical classroom environment which emerged from the data as being of significance to time on task and academic engaged time were combined into two categories: formality of the classroom setting and planned seating for the target student.

11.3.4.i Formality of setting in relation to time on task and academic engaged time

When the regular classroom teacher was in control Mitchell's classroom setting was rated on all observations but one as being very informal (see column 7). The exception was the observation of the yearly mathematics test (Observation 27) which rated moderate. The room arrangement changed regularly throughout the observation period. The teacher explained that she wanted the classroom to have a *"homely feel"* (post observation interview, 8/5/96). Figure 11.1 portrays the classroom setting and arrangement of desks during several weeks of the second stage of data collection. Students were permitted, if not actively encouraged, to have personal belongings such as toys in the centre of their table groupings. This, in fact, was the purpose of a central table within each group. Items of clothing, lunch boxes and other personal belongings also congregated there. Because of the additional desk in the middle of most table groupings physical space was at a premium within the room.

The overhead projector screen was located at an angle across a back corner of the classroom. The overhead projector, when in use, was located on the central table of one group of desks in front of the screen. Many of the children had to turn or position their chairs differently when working from the overhead screen.

Student work was displayed on surrounding walls and suspended across the room. Students were permitted to move about the classroom as they needed to get equipment. This contributed greatly to the sense of informality within the classroom.

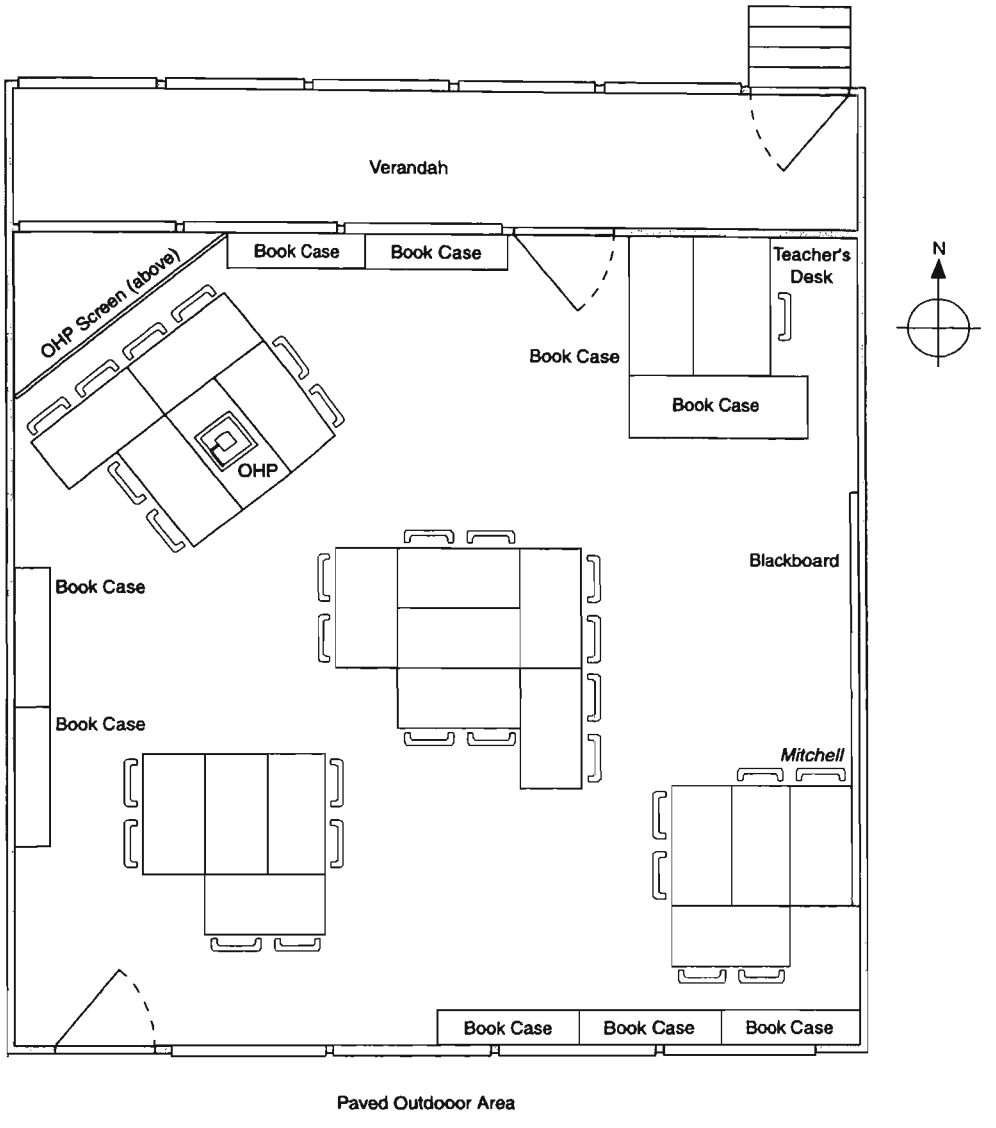

Figure 11.1: Plan of Mitchell's Classroom

In terms of how she believed the classroom should be set up for learning, Mitchell's teacher commented:

> Children should feel like they have some control over their environment and some choice in what they do. Their classroom should be their home away from home. That's why I let them put their desks that way – it doesn't look too much like a classroom. They have room to have some of their things around them. They're

> free to move around to get whatever they need...children respond best when they're given autonomy in the classroom. (teacher interview, 5/12/96)

Low levels of formality in the classroom setting did not appear to contribute to higher percentages of TOT or AET for Mitchell (see column 7 in relation to columns 5 and 6).

The learning environment was rated as moderate in formality for the two lessons which were not conducted in the regular classroom, with one conducted in the school library (Observation 17) and another in a normally empty classroom for the Macedonian speakers (Observation 24).

11.3.4.ii Planned seating in relation to time on task and academic engaged time

Mitchell was not usually purposefully placed in particular positions by the class teacher. This resulted in ratings of "low" for planned seating throughout all observation periods (see column 8).

At the beginning of Stage Two of data collection Mitchell's desk was positioned against the back wall for several days. When seated Mitchell directly faced the back wall. This was his choice. When asked why he had this preference, he answered, *"Just trying something different"* (17/7/96).

Later in the observation period Mitchell's desk was with a group of tables which was located at the extreme front of the room against one section of the blackboard (see Figure 11.1). This again was the choice of the boys on that table. Because of the element of choice available to Mitchell regarding his seating position, pupil placement was rated as low. Placement in the classroom was not based on any strategic plan designed, for example, to limit distractions or place Mitchell near on-task peers.

This informal arrangement of desks did not appear to contribute to on-task behaviour or academic engagement as Mitchell's scores were consistently low for both measures.

Table 11.4

Organisation of the Physical Environment in Relation to Time on Task and Academic Engaged Time for Mitchell

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 FS	8 PS
1	maths-practical	30	med	13%	0%	low	low
2	editing	20	high	7%	7%	low	low
3	creative writing	40	high	11%	9%	low	low
4	cut/paste/colour	30	low	14%	n/a	low	low
5	indiv reading activ's	40	high	23%	10%	low	low
6	handwriting	30	med	27%	20%	low	low
7	maths revision	34	med	12%	9%	low	low
8	news	10	low	60%	30%	low	low
9	maths-practical	30	med	30%	30%	low	low
10	copying, drawing	30	med	13%	7%	low	low
11	silent reading	15	med	0%	0%	low	low
12	ind spell activities	28	med	18%	14%	low	low
13	pers devt discussion	5 #	low	0%	0%	low	low
14	pers devt discussion	7 #	low	0%	0%	low	low
15	story listening	15	low	80%	n/a	low	low
16	maths exercises	15	high	13%	13%	low	low
17	*library	30	low	0%	0%	mod	low
18	story listening	10#	low	0%	n/a	low	low
19	maths exercises	50	high	10%	4%	low	low
20	silent reading	15	med	100%	100%	low	low
21	spelling activities	30	med	13%	13%	low	low
22	catchup activities	50	med	26%	11%	low	low
23	copying poem	20	med	40%	30%	low	low
24	*multicult speaker	30	low	90%	73%	mod	low
25	maths/proc text	40	high	30%	15%	low	low
26	handwriting	15	med	0%	0%	low	low
27	maths testing	40	high	10%	10%	mod	low
28	craft	30	low	63%	n/a	low	low
29	reading activities	30	high	27%	20%	low	low
30	peer support	30	low	0%	0%	low	low
31	science	35	med	20%	20%	low	low
		total = 834		mean = 24%	mean = 19%		

Key

LC	lesson content	FS	formality of setting
M/O	minutes of observation	PS	planned seating
TD	task demand	*	lesson not taught by class teacher
TOT	time on task	#	Mitchell exited from room
AET	academic engaged time		

11.3.5 Managing behaviour of teacher in relation to time on task and academic engaged time for Mitchell

Table 11.5 reveals how different aspects of the teacher's managing behaviour related to Mitchell's time on task and academic engaged time.

11.3.5.i Monitoring behaviour and teacher redirects in relation to time on task and academic engaged time

Table 11.5 reveals that the teacher's monitoring behaviour varied. No pattern emerged of particular levels of monitoring behaviours with certain task types (see column 2 in relation to column 7). Higher levels of monitoring were not associated with increased AET or TOT (see column 7 in relation to columns 5 and 6). Two of the three periods of relative high AET and TOT had low levels of monitoring.

The teacher often monitored the class from a seated position at her desk. It was not possible to see all students' faces from any one point in the classroom because of the positioning of the students' desks. Mitchell was occasionally sent outside the room to the "wet area" to complete work, but usually played with the blinds or talked to other children out there from other classes. This area was not monitored at all.

Low levels of monitoring were evident with the other (non-target) students with ADHD in the classroom. On one occasion Paul had his hand up for over three minutes before lowering it without receiving acknowledgement. Paul did not cause disruption in the classroom and interacted with few people.

Throughout one particular lesson, Mark (another student with ADHD in the study who has not been presented in detail) and a peer spent 25 minutes looking through books together, having been directed to *"Start doing some work on your project"*. This

activity could have been highly productive; it may not have been. There was no monitoring to determine which it actually was.

Toby, who had been integrated from the class for mildly intellectually disabled students for the second half of the year, had an average TOT of 7%, the lowest of all students in the study. He had a vast repertoire of task avoidance strategies: going to the toilet; emptying and reorganising his pencil case; sharpening pencils; closing the door; and ruling margins, erasing them and ruling them again. Appendix E1 is a typical example of many pages of Toby's books: a heading and date and a ruling-off line, followed by another partially completed heading and another ruling-off line, followed by another heading and yet another ruling-off line. A large component of these three lessons was the written work involved, but none was completed.

Mitchell received multiple redirects from the teacher during almost every observation period (see column 8), but there was no relationship between the number of redirects and AET. The focus on Mitchell meant that many other students in the classroom rarely received individual attention.

11.3.5.ii Use of explicit language in relation to time on task and academic engaged time

Use of direct language was rated as low on most occasions (see column 9). Typical redirects consisted of statements such as, *"You're wasting time, Mitchell"* (5/8/96), *"Are you going to have anything to show me?"* (20/8/96), *"Mitchell, are you listening?"* (9/9/96) and *"Come on, Mitchell"* (9/9/96). On one occasion, the teacher said, *"Mitchell, I'm using nonverbal language with you. Are you getting what I'm thinking?"* (14/11/96). Mitchell shrugged and moved off to get some equipment but was almost immediately distracted again. Clearly he had not received the message.

On another occasion after Mitchell had spent considerable time off-task and interfering with others, the teacher said, *"Put your hands on your head for two minutes, Mitchell, and I want you to think carefully about your attitudes and actions"* (30/8/96). Mitchell put his hands on his head and went through an elaborate mime of trying to see his watch while his hands were on his head. The teacher did not respond to this and Mitchell put his hands down after about 30 seconds, an action which again received no response from the teacher.

An excerpt from a memo recorded on a non-target student, Toby, also serves as a useful example of the effect of less than explicit language:

> **Effect of non-explicit language? 21/8/96**
> Class was engaged in independent seatwork, completing maths exercises from a textbook. Toby was gazing around. The teacher was seated at desk marking poetry books, occasionally glancing up at the class. She looked at Toby, who looked back at her. The teacher said, *"I'm watching you, Toby"*. Toby looked blank for a few seconds and then gave a small tentative wave to the teacher. The teacher responded with, *"Can't you do it?"* to which Toby replied, *"Yes"*. The teacher then said, *"That's OK, then"* and resumed marking.

The intended message - presumably "get on with your work" - had not been received. Toby appeared confused by the statement, *"I'm watching you"*, and responded by waving. (In an informal discussion about this incident later, Toby said *"Mrs W..... was just being nice"* [21/8/96]). The teacher's following question, *"Can't you do it?"* asked from the desk some distance away and thus in a very public manner, was not likely to receive an accurate response from a student who was struggling to cope and "fit" into a new class. There was no follow-up to determine whether or not he was, in fact, able to do the set task.

During Observation 9 teacher language was rated as moderately direct because she said, in a voice expressing considerable frustration, *"Get up. Go and pick the paper up and put it in the bin"*. Mitchell complied, goose-stepping to the bin, but did not remain on task after that. This level of language was a rarity and only seemed to appear as a sign of frustration.

As there were few periods of high TOT or AET, it could be stated that the use of indirect language was not related to these measures.

11.3.5.iii Positive interactions with target student in relation to time on task and academic engaged time

Mitchell received few individual positive interactions from the teacher throughout the periods of observation (see column 10). He received two from another teacher during the talk by the Macedonian speaker because of his *"uncharacteristically good behaviour"* (post observation comment, 21/11/96). Mitchell's teacher expressed fondness for him and sympathy for his difficult home situation but his dominating presence in the classroom meant that he was a constant source of frustration for her.

11.3.5.iv Evidence of routines in relation to time on task and academic engaged time

Reference to Table 11.5 reveals that there was little evidence of routines within the classroom (see column 11). There were no set procedures for distributing or collecting materials. Students were responsible for organising their own materials which meant a great deal of movement around the room by individuals. During Observation 12, there was some evidence of routine in that the class was used to following instructions regarding a series of spelling activities written on an overhead transparency. Mathematics activities also followed this format occasionally, whereby practical and written work instructions were written on an overhead.

Mitchell's teacher encouraged him to work, and tried to counsel him, but believed it was inappropriate to engage in what she perceived to be coercive management practices. She explained her efforts to manage Mitchell's behaviour and encourage him to stay on task thus:

> I've tried different things. I give him extra praise. I tell him he can have more computer time if he gets things done but it hardly has a short-term effect, let alone a long-term effect. I've tried to be consistent, I've spoken to his mother and sent behaviour cards home, but he's like a brick wall.
>
> Jan (executive member of staff) told me he works well with Gestapo tactics. It sounds horrible. I can't be like that. They need to know they're cared for and that I have confidence in them to do the right thing. I don't want to be Hitler-like. Is that what teachers are meant to do? (teacher interview, 6/12/96)

In Mitchell's case, the lack of routine procedures was not associated with higher percentages of TOT or AET (see column 11 in relation to columns 5 and 6).

Table 11.5

Managing Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Mitchell

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 MB	8 TR	9 DL	10 PI	11 R
1	maths-practical	30	med	13%	0%	mod	3	low	0	low
2	editing	20	high	7%	7%	mod	5	low	0	low
3	creative writing	40	high	11%	9%	low	2	low	0	low
4	cut/paste/colour	30	low	14%	13%	mod	5	low	1	low
5	indiv reading act's	40	high	23%	10%	mod	4	low	0	low
6	handwriting	30	med	27%	20%	low	2	low	0	low
7	maths revision	34	med	12%	9%	mod	5	low	0	low
8	news	10	low	60%	30%	mod	1	low	0	mod
9	maths-practical	30	med	30%	30%	high	6	mod	0	low
10	copying; drawing	30	med	13%	7%	high	5	low	0	low
11	silent reading	15	med	0%	0%	mod	0	low	0	low
12	ind spell act's	28	med	18%	14%	high	6	low	0	mod
13	personal devt	5 #	low	0%	0%	mod	1	low	0	low
14	personal devt	7 #	low	0%	0%	mod	1	mod	0	low
15	story listening	15	low	80%	n/a	mod	1	low	1	low
16	maths exercises	15	high	13%	13%	mod	3	low	0	mod
17	library	30	low	0%	0%	high	9	mod	1	mod
18	story listening	10#	low	0%	n/a	high	1	mod	0	low
19	maths exercise	50	high	10%	4%	low	2	low	0	mod
20	silent reading	15	med	100%	100%	low	0	low	0	low
21	spelling activities	30	med	13%	13%	high	9	low	1	low
22	catchup activities	50	med	26%	11%	low	1	low	0	low
23	copying poem	20	med	40%	30%	low	2	low	0	low
24	*multicult speak	30	low	90%	73%	low	0	mod	2	low
25	maths/proc text	40	high	30%	15%	mod	4	low	0	low
26	handwriting	15	med	0%	0%	low	0	low	0	low
27	maths testing	40	high	10%	10%	mod	3	low	0	low
28	craft	30	low	63%	n/a	low	1	low	1	low
29	reading activities	30	high	27%	20%	high	6	low	0	low
30	peer support	30	low	0%	0%	low	0	low	0	low
31	science	35	med	20%	20%	low	2	low	0	low
		total = 834		mean = 24%	mean = 19%					

KEY

LC	lesson content	DL	direct language
M/O	minutes of observation	PI	positive interactions with target student
TD	task demand		
TOT	time on task	R	routines
AET	academic engaged time	*	lesson not taught by class teacher
MB	monitoring behaviour	#	Mitchell exited from room
TR	teacher redirection		

11.3.6 Teacher instructional behaviour in relation to time on task and academic engaged time for Mitchell

Table 11.6 showed associations between Mitchell's time on task, academic engaged time and the instructional behaviour of the teacher.

11.3.6.i Level of demonstrations in relation to time on task and academic engaged time

Demonstrations were not observed often in this classroom (see column 6). When they did occur, they were brief. One more explicit demonstration was observed for a craft lesson (Observation 28) although instructions had to be augmented several times throughout the lesson because some significant points had not been mentioned (such as the orientation of the sheet of paper when drawing the mask). In Mitchell's case it appeared that the usual practice of a brief demonstration or none at all did not contribute to high percentages of TOT or AET (see column 6 in relation to columns 4 and 5).

11.3.6.ii Level of task setting in relation to time on task and academic engaged time

Task setting was not explicit in nature (see column 7). Instructions tended to be phrased in general terms, for example: *"Do the worksheet"* (Observation 5); *"Do the next page in your maths book"* (Observation 7); *"Go and finish something"* (Observation 22); or *"Do the set on page 3"* (Observation 25). Other comments included *"You haven't done much"* (Observation 29) but specific or elaborated directions were not given. Written instructions that were occasionally provided on an overhead transparency were similarly phrased, referring to exercise numbers rather than providing precise instructions.

In the lesson referred to in Observation 3, students were instructed to *"Write an advertisement for some skill that your brain needs."* At this point, a worksheet was

distributed (see Appendix E2). No further instructions were given and the teacher left the room for 14 minutes. Mitchell announced several minutes after she had left, *"No-one knows what to do and I don't either. I think you have to write an ad."* The task was not made clear on the worksheet and the varied attempts at this task (see Appendix E2, E3, and E4) revealed that a range of interpretations were made.

During Observation 21, one of the more capable students was instructed to *"Help Toby do his spelling"*. The student stood in front of Toby for approximately five minutes before returning to his seat. When questioned after this observation the peer reported, *"I was waiting for Toby to ask me questions, but he didn't"* (peer interview, 5/11/96). It appeared that he was not clear what "helping Toby" should entail. In these situations, TOT and AET were not facilitated by the lack of explicit task setting.

11.3.6.iii Direct teacher approach/assist behaviour in relation to time on task and academic engaged time

The teacher directly assisted Mitchell with academic tasks at least once during every observed lesson when this was relevant (see column 8). Occasionally Mitchell received individual assistance on two or three occasions within one lesson. When this was considered in combination with the number of redirects he received from the teacher it was clear that Mitchell used a great deal of teacher time. In Mitchell's case, however, teacher assistance was not responsible for high overall percentages of TOT or AET (see column 8 in relation to columns 4 and 5).

11.3.6.iv Maintenance of momentum in relation to time on task and academic engaged time

Lesson momentum was judged to be low throughout most observations (see column 9). Most regular classroom activity was regularly interrupted by redirects to Mitchell and to other students within the classroom. Often directions had to be repeated several times before the class as a whole settled to work. The level of movement around the room as individuals gathered materials appeared to contribute to the lack of momentum as other students were bumped or had to move to enable individuals to gather what they required.

The news session (Observation 8) was assessed as moderate in momentum in that several students had an opportunity to present news and many more had an opportunity to ask questions of the presenters and this occurred at a reasonable pace. The library lesson under the direction of the teacher-librarian also maintained moderate levels of momentum, as did the lesson with the Macedonian visitors.

The low levels of momentum that characterised classroom activity were not associated with high percentages of TOT or AET (see column 9 in relation to columns 4 and 5).

11.3..6.v Frequency and type of feedback in relation to time on task and academic engaged time

The frequency of feedback on academic tasks, as opposed to behaviour, was low (see column 10). When it did occur it was not explicitly related to the task (see column 11). Comments such as *"You haven't done much"* (Observation 29) did not provide specific information related to the task. Low levels of feedback were not associated in Mitchell's case with high percentages of TOT or AET (see columns 10 and 11 in relation to columns 4 and 5).

Table 11.6

Instructional Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Mitchell

1 ObNo	2 LC	3 TD	4 TOT	5 AET	6 Dem	7 TS	8 TAA	9 MM	10 FF	11 PF
1	maths-practical	med	13%	0%	-	low	0	low	low	low
2	editing	high	7%	7%	-	low	2	low	low	low
3	creative writing	high	11%	9%	-	low	1	low	low	low
4	cut/paste/colour	low	14%	n/a	low	low	1	low	low	low
5	ind reading activities	high	23%	10%	-	low	1	low	low	low
6	handwriting	med	27%	20%	-	low	1	low	low	low
7	maths revision	med	12%	9%	-	low	3	low	mod	low
8	news	low	60%	30%	n/a	low	1	mod	low	mod
9	maths-practical	med	30%	30%	low	low	2	low	low	low
10	copying; drawing	med	13%	7%	-	low	0	low	low	low
11	silent reading	med	0%	0%	n/a	low	n/a	n/a	n/a	n/a
12	ind spelling activities	med	18%	14%	-	low	1	low	low	mod
13	personal devt discussion	low	0%	0%	n/a	low	n/a	low	low	low
14	personal devt discussion	low	0%	0%	n/a	low	n/a	low	low	low
15	story listening	low	80%	n/a	n/a	low	n/a	mod	low	low
16	maths exercises	high	13%	13%	low	low	1	low	low	low
17	*library	low	0%	0%	n/a	low	1	mod	mod	mod
18	story listening	low	0%	0%	n/a	low	n/a	low	?	?
19	maths exercises	high	10%	4%	-	low	1	low	low	low
20	silent reading	med	100%	100%	n/a	low	n/a	n/a	n/a	n/a
21	spelling activities	med	13%	13%	-	low	1	low	low	low
22	catchup activities	med	26%	11%	-	low	1	low	low	low
23	copying poem	med	40%	30%	low	low	1	low	low	low
24	*multicultural speaker	low	90%	73%	n/a	mod	n/a	mod	mod	mod
25	maths/procedural text	high	30%	15%	-	low	2	low	low	low
26	handwriting	med	0%	0%	-	low	0	low	low	low
27	maths testing	high	10%	10%	n/a	mod	0	low	n/a	n/a
28	craft	low	63%	n/a	mod	low	0	low	low	low
29	reading activities	high	27%	20%	-	low	0	low	low	low
30	peer support	low	0%	0%	n/a	low	0	low	low	low
31	science	med	20%	20%	low	mod	0	low	low	low
			mean = 24%	mean = 18%						

Key

LC	lesson content	TAA	teacher approached/assisted
TD	task demand	MM	level of momentum
TOT	time on task	FF	frequency of feedback
AET	academic engaged time	PF	process feedback
Dem	teacher demonstration	*	lesson not taught by class teacher
TS	level of task structure	?	data not observed or not recorded

11.4 SUMMARY OF DATA RELATED TO MITCHELL

Mitchell scored low average percentages for both TOT and AET for most regular class activity, with only one silent reading lesson and a lesson with visitors to the school scoring in the high (70% or above) range for AET. His scores on both measures were greater for low demand tasks. These findings are consistent with Krupski's (1985) research on the relationship between low demand tasks and higher percentages of academic engaged time.

High levels of ADHD-related behaviours were observed throughout almost all lessons, the exceptions being the few periods of high TOT and AET. Mitchell approached his teacher often for assistance but this was not related to periods of high TOT or AET. One observation period of high TOT and AET included two positive interactions initiated by Mitchell but on most occasions his interactions were considered to be interrupting his peers. He appeared unable to monitor his behaviour appropriately. He did not model peer behaviour as the younger students appeared to do. He was, however, observed moving his legs rhythmically when listening attentively to a story on one occasion which was similar to what one of the younger students did.

There were relatively few negative responses observed from his peers although it was the teacher's belief that they were becoming progressively less tolerant of his behaviour.

The low formality of Mitchell's classroom, the low monitoring behaviour and large number of teacher redirects did not occur in association with higher percentages of TOT and AET. The classroom was characterised by indirect rather than direct language and low use of routine procedures. These factors were not associated with high levels of TOT or AET.

Demonstrations tended to be brief with little structured task setting. Direct teacher assistance occurred in almost every observed lesson but this was not associated with high percentages of TOT or AET. Momentum in the classroom was generally rated as being low and feedback tended to be general in nature rather than specifically related to the learning tasks.

11.5 EMERGING TRENDS

Mitchell's behaviour had a significant impact on the ecology of his classroom, both in terms of his own learning and the learning of his peers. The reciprocal relationship between an individual and the environment is clearly demonstrated in Mitchell's case.

Mitchell's teacher certainly had warm and positive feelings for Mitchell and was keen to provide a safe and nurturing environment for her students. This perhaps could be viewed as the guiding principle in her approach to teaching. Yet this *alone* did not result in an effective learning environment for a student who was unable to monitor and manage his own learning.

In many ways the classroom environment did not appear to match Mitchell's needs. Few of the learning tasks were of sufficient intrinsic appeal to engage him. Mitchell did not often demonstrate the motivation and the ability to resist distraction that characterises engagement in molar activities. The informality of the setting did not appear to provide enough support or direction for him, the monitoring and management strategies employed by his teacher were not successful in redirecting him to task, and the instructional strategies were not structured enough for a student who was constantly drawn off task.

In Bronfenbrenner's (1979) terms, the relationship between Mitchell and his teacher, while positive, would not be considered a developmental dyad. There was no sense of

shared goals, nor of the power being transferred from the more skilled person to the developing person. It could be argued, in fact, that the person with the most power in the classroom was Mitchell because he "directed" most of what occurred there. In many ways, Mitchell prevented his teacher from fulfilling her role as a teacher.

It could also be proposed that his teacher did not organise an environment that allowed Mitchell to function in his role as a student. Mitchell's high levels of distractibility, impulsivity and hyperactivity interacted with the freedom of movement, availability of distractors and lack of clear demonstrations and structured task setting in his classroom to increase the likelihood that he would be unable to attend to tasks. In Mitchell's case, it appeared that there were many elements of the classroom microsystem that were not conducive to an effective learning environment for him despite the fact that he had a teacher who clearly wanted the best outcome for all her students.

This chapter has presented findings related to Mitchell whose average percentages of time on task and academic engaged time were low. Structures in place in his classroom did not appear to facilitate high time on task or academic engagement for Mitchell. In the next and final results chapter, findings relating to Eric have been presented. Common themes drawn from the data relating to all target students will then be discussed in Chapter Thirteen.

CHAPTER TWELVE

FINDINGS RELATED TO ERIC

In this chapter findings relating to the last of the target students, Eric, are presented. Eric was included because early observations revealed that his behaviour was very different from the other students diagnosed with ADHD. His story was clearly worth investigating.

As with the other case studies, some preliminary background information is presented before the different aspects of Eric's environment are examined.

12.1 BACKGROUND INFORMATION ON ERIC

Eric is the first child of a school teacher mother and a middle manager father. He has a sister three years younger.

12.1.1 Early development

Born as the result of an emergency caesarian after a failed forceps delivery, Eric had experienced low muscle tone and poor motor co-ordination since birth. Early paediatric assessments reported *"mild development delay"* (as noted in a report shown to the researcher during the parent interview). His mother described him as an *"intense, sensitive and emotional"* boy (parent interview, 30/10/96). Eric was aged eleven years at the beginning of the observation period.

Early school experiences were positive and his mother, a kindergarten teacher, considered him to be *"on track"* with his reading until the family changed location and Eric enrolled in a new school (not the school involved in the research). Eric's behaviour at home changed markedly, with regular tantrums, and he began having

difficulty with reading and homework in other subjects. There was also a marked increase in what his mother referred to as *"disproportionate negativity"* (parent interview, 30/10/96). By the time he entered Year Four at the school he attended throughout the period of research, Eric's behaviour and school progress were causing serious concern.

12.1.2 Diagnosis of ADHD

Eric was assessed as having ADHD (referred to in a paediatric report sighted by the researcher during the parent interview as "mainly attention problems but including hyperactivity") in May, 1994 when he was 9.5 and in Year 4 at Site Two. His parents were initially reluctant to put him on medication. They did a parenting course, Eric attended speech therapy, and they reportedly *"tried lots of other things"* but when his behaviour and negativity failed to improve, they *"relented and tried the medication"* (parent interview, 30/10/96). He was prescribed Ritalin in September of that year. There were rapid increases in his attention and his extreme sensitivity to criticism improved, but there was also evidence of depression, sleep difficulties, and appetite loss. The family persisted because of the clear benefits the medication appeared to provide and the side effects decreased after about three months.

12.1.3 Formal assessment and progress at school throughout period of research

Eric was in the Year 6 cohort of a composite 5/6 class during the year of observation. According to teacher records he operated in the top five of the class and was one of the best and most voracious readers. This level of achievement was particularly remarkable considering he had an early diagnosis of developmental delay and just two years prior to the period of observation his reading was judged to be so delayed that he attended the Intensive Reading class at the school. Assessment on the Sutherland Phonological

Awareness Test (Neilson, 1995) revealed that he still had difficulties with some of the higher level phonological skills.

12.1.4 Relationships between home and school

Eric's family was considered by the school to be extremely supportive and there was regular contact between home and school. There was also a high level of consistency in expectations between home and school. His mother reported that as a result of attending seminars for families of children with ADHD she had developed many organisational strategies to assist Eric at home. These included posting task lists which assisted him to get ready for school, pack his bag in the morning, and prepare for cricket. Even at the dining table markers indicated where his chair, plate and cutlery should be. These environmental cues had, she reported, resulted in greatly improved management of Eric's daily routine (parent interview, 30/10/96 - all comments in this section were recorded at the interview on this date).

Eric's mother assisted him each night with his homework. She felt that his teacher's approach ideally suited Eric. Eric often had the opportunity to prepare for something the next day, whether it be a writing or reading task, or a craft activity. *"Eric gets twice as much teaching as some other children because I can help him with it at night and then he goes off knowing he can do what he has to do and it all gets reinforced with Ed (Eric's teacher) the next day. He's so much more motivated because he knows he can be successful. That's what's made the difference, I'm sure".* His mother also reported that Eric had responded very positively to his teacher and that she had never seen him so motivated to read and to achieve well at school. *"I actually went up to complain when I knew a casual teacher was taking the class this year* (replacing a teacher who was on maternity leave) *because I was so worried about the disruption it would cause, especially Year 6 and trying to get ready for high school - mainly I was worried about Eric of course because he had a bad year last year and couldn't seem to get on top of*

everything – but it was the best thing that could have happened. The whole class loves him". Eric himself said on the same occasion, *"We've never had a teacher that liked us so much – well, not all of us".*

12.2 CONCEPTUAL ISSUES HIGHLIGHTED BY FINDINGS RELATED TO ERIC

The data revealed that Eric scored extremely high percentages of time on task and academic engaged time on tasks of all kinds. Very little of the behaviour commonly associated with ADHD was observed. It was, therefore, of great interest to examine the various elements of Eric's environment to determine what factors may have contributed to these uncharacteristically high percentages. Eric's case highlighted a range of factors relating to the research questions posed in Chapter One, including:

- how students with a diagnosis of ADHD may overcome a predisposition to learning and behavioural problems;
- the relationship between task characteristic and task engagement;
- the relationship between classroom management practices and task engagement;
- the relationship between instructional strategies and task engagement; and
- the significance of the affective climate of a classroom.

12.3 TABULATED DATA FROM CLASSROOM OBSERVATIONS

Table 12.1 provides an overview of the 21 classroom observations of Eric showing relationships between time on task, academic engaged time, day and time of observation, lesson content, minutes of observation, task match and task demand.

Eric's average TOT was calculated at 95% and his average AET at 78%. When compared to the other students in this study and in related research, these are extremely high. The average AET for morning periods of observation for Eric was 83% and for afternoon periods 69%, demonstrating some preference for morning activity.

Observations during which percentages of TOT and AET were 70% or over have been shaded in Table 12.1 and all proceeding tables for ease of analysis.

12.3.1 Task characteristics, time on task and academic engaged time

Average AET on low demand tasks was 75%, on medium demand tasks was 77% and on high demand tasks 80%, revealing no great differences. Academic engaged time was, as noted previously, comparatively high for all tasks.

Also of note in Table 12.1 was the relatively few low demand lessons observed: only three of twenty (see column 5). This classroom would be considered to be academically focused for a large part of the day. In eleven of the twenty lessons observed, medium or high demand tasks resulted in high levels of AET (see column 8). Thus, even on those tasks that were most cognitively demanding, Eric was often able to maintain high levels of AET.

Table 12.1

Task Characteristics in Relation to Time on Task and Academic Engaged Time for Eric

1 ObNo.	2 D/T	3 LC	4 M/O	5 TM	6 TD	7 TOT	8 AET
1	Wed mm	mathematics	45	high	high	89%	60%
2	Wed aft	quiz/marking	10	high	med	100%	100%
3	Fri m	reading comprehension	35	high	high	100%	100%
4	Mon mm	oral reading	20	high	med	77%	65%
5	Thurs aft	watching video	30	high	low	100%	n/a
6	Mon m	language/spelling	40	high	high	100%	100%
7	Tues mm	marking language	20	high	med	100%	100%
8	Wed aft	peer support discussion	20	high	low	100%	75%
9	Thurs m	maths	10	high	high	100%	100%
10	Thurs mm	spelling quiz	25	high	high	80%	80%
11	Tues aft	trans'n/comprehension	40	high	high	100%	80%
12	Thurs m	language activities	45	high	high	100%	71%
13	Mon aft	science-discussion/notes	40	med	high	60%	50%
14	Wed m	marking homework	15	high	med	100%	96%
15	Thurs m	Multicult Day organisation	20	high	med	100%	n/a
16	Fri mm	dance practice	30	med	low	100%	n/a
17	Mon m	reading	20	high	med	100%	55%
18	Tues mm	speech/lang	20	high	high	100%	78%
19	Mon m	procedural text writing	25	high	med	100%	88%
20	Tues aft	personal development	30	med	med	90%	50%
21	Thurs aft	personal development	30	med	med	84%	60%
			total = 570			mean = 95%	mean = 78%

Key

Ob no.	observation number	TM	task demand
D/T	day and time	TD	task demand
LC	lesson content	TOT	time on task
M/O	minutes of observation	AET	academic engaged time

12.3.2 Target student (Eric) behaviour in relation to time on task and academic engaged time

Table 12.2 presents time on task and academic engaged time percentages in relation to Eric's own behaviour. This revealed the extent to which Eric's individual behaviour contributed to the ecology of the classroom.

12.3.2.i Evidence of ADHD characteristics in relation to time on task and academic engaged time

Eric did not present as typical of a student diagnosed with ADHD. Unlike all other target students he was assessed as having few attention, impulsivity or hyperactivity problems throughout the observation periods (see columns 7, 8 and 9). He was almost always on task, even during independent seatwork, and rarely demonstrated any level of impulsivity. He had no difficulty making transitions from one activity to the next whether this was under the teacher's direction or not. Eric participated willingly in all class activities, volunteered regularly to give answers (and was usually correct), and did not interrupt or call out answers. On only three occasions was he assessed as having moderate attention difficulties (see Observations 4, 10 and 13, column 7). One of these was an oral reading class and Eric became distracted when a less capable reader had his turn. In another lesson during which Eric demonstrated moderate attention difficulties his attention wandered when the teacher read briefly from some notes.

Eric's only behaviours typical of an ADHD student were his poor level of organisation and untidy bookwork. His desk was in constant disarray with items regularly spilling onto the floor around him.

12.3.2.ii "Approaching teacher" behaviour in relation to time on task and academic engaged time

Eric was not observed directly approaching the teacher. He did, however, actively participate in quizzes, indicated by the number of times he volunteered answers in Observations 2, 7, 8, 12, 14 and 17 (see column 10). The number of times Eric volunteered was an indicator of his high involvement in lessons. Maintaining engagement through high levels of student/teacher interaction is a strong recommendation throughout the effective teaching literature and appears to have been confirmed by this study.

12.3.2.iii "Initiating positive interactions with peers" in relation to time on task and academic engaged time

Eric occasionally initiated interactions with peers (see column 11) and when he did, it was always with a peer close by. This usually took the form of a quiet comment about an activity they were involved in.

12.3.2.iv "Interfering with peers" in relation to time on task and academic engaged time

Eric was not observed interfering in any way with peers (see column 12). The occasional comments he made to a peer usually received brief but positive responses.

12.3.2.v "Imitating peer behaviour" in relation to time on task and academic engaged time

Eric, like the Kindergarten students, occasionally imitated his peers when unsure of what to do rather than ask the teacher (see column 13). He would generally look at what a peer was doing or quietly ask. This did not occur with great frequency suggesting that he was usually aware of how to proceed.

Table 12.2

Target Student (Eric) Behaviour in Relation to Time on Task and Academic Engaged Time

1	2	3	4	5	6	7	8	9	10	11	12	13
ObNo.	LC	MO	TD	TOT	AET	ATT	IMP	HYP	AT	IIP	IP	ImP
1	mathematics	45	high	89%	60%	low	low	low	0	1	0	1
2	quiz/marking	10	med	100%	100%	low	low	low	13v	0	0	0
3	read'g comp	35	high	100%	100%	low	low	low	0	0	0	0
4	oral reading	20	med	77%	65%	mod	low	low	0	0	0	0
5	watching video	30	low	100%	n/a	low	low	low	0	0	0	0
6	lang/spelling	40	high	100%	100%	low	low	low	0	1	0	2
7	marking lang	20	med	100%	100%	low	low	low	7v	0	0	0
8	peer support disc	20	low	100%	75%	low	low	low	8v	0	0	0
9	maths	10	high	100%	100%	low	low	low	0	0	0	0
10	spelling acts	25	high	80%	80%	mod	low	low	n/a	0	0	0
11	trans/compre	40	high	100%	80%	low	low	low	0	0	0	0
12	lang activities	45	high	100%	71%	low	low	low	8v	1	0	1
13	sci-disc/notes	40	high	60%	50%	mod	low	low	0	0	0	0
14	marking homework	15	med	100%	96%	low	low	low	4v	0	0	0
15	Multicult Day org	20	med	100%	n/a	low	low	low	0	0	0	0
16	dance prac	30	low	100%	n/a	low	low	low	0	0	0	3
17	reading	20	med	100%	55%	low	low	low	2v	0	0	0
18	speech/lang	20	high	100%	78%	low	low	low	0	0	0	0
19	proc text	25	med	100%	88%	low	low	low	0	0	0	0
20	pers devt	30	med	90%	50%	low	low	low	0	0	0	0
21	pers devt	30	med	84%	60%	low	low	low	0	0	0	0
		total =570		mean = 95%	mean = 78%							

Key

LC	lesson content	AET	academic engaged time
M/O	minutes of observation	AT	approached teacher
TD	task demand	IIP	initiated positive interaction with peer
TOT	time on task	IP	interfered with peer
ATT	attention difficulties	ImP	imitated peer behaviour
IMP	impulsivity evident	v	Eric volunteered answer
HYP	hyperactivity evident		

12.3.2.vi Other behaviours occurring with on task behaviour and academic engaged time

As strong preferences for visual stimulation were observed with most of the younger students in that they were much more frequently on task when there was a visual component to a lesson, it was interesting to note Eric's behaviour in this context.

Originally little preference for visual activities seemed apparent. This proposition was revised as data collection proceeded.

Evidence of greater levels of attention during visually-based activities became apparent when examining the two occasions when Eric's time-on-task dropped below 80%. On the first of these occasions the class was involved in oral reading around the class when I entered. Eric's time on task for this 20 minute observation period was assessed as 77%. The relevant memo recorded after this observation follows:

> **Effect of little visual stimulation? 5/8/96**
> Eric was following as another student read. The teacher occasionally made comments, relating aspects of the story to individual class members (*"That sounds just like you, Coconut"*, *"You'd love that, Lizard"*). Soon after I entered, Eric was called upon to read. (He read very well, with good intonation and appropriate expression. He successfully read the words "potential" and "unselfconsciously", his only errors being the mispronunciation of "astounded" as "astonded", and a slight [th]/[v] problem).
>
> While Eric was reading there were two interruptions at the door and while the teacher attended to these Eric continued to read ahead silently, apparently preparing for his continued oral reading. Eric then continued to read briefly after which another student was called upon. This student was less successful and Eric started to stretch and gaze around within about twenty seconds. He followed sporadically from that point on, only becoming engaged as the teacher made specific comments.

One could speculate that Eric relaxed and "turned off" because he believed that he would not be called on again, having had his "turn", but there is clearly a lack of visual stimulation in this activity.

The second occasion occurred on the first day of Term 4 when Eric's time on task in a science lesson of 40 minutes' duration was assessed as 60%. The desks had been reorganised and Eric was now positioned at the front of the room.

> **Effect of little visual stimulation? 14/10/96**
> The teacher was introducing a lesson on clouds as part of a science unit on weather. The teacher had several large visual aids which he referred to often as he directed a discussion about clouds and asked a series of questions. Eric attended to the discussion, turning his head in the direction of each person who answered a question.
>
> The teacher occasionally read short sections from an overhead transparency which was placed on the overhead projector but which was not illuminated. The first time he did this Eric stretched forward, apparently trying to see what was written on the overhead. He appeared to be unsuccessful in this endeavour and from that point on his gaze wandered around the room whenever the reading took more than a few seconds. What brought him back to task on most occasions was when the teacher again referred to some of the visual aids or made some jocular comment.

It could be quite significant that Eric turned to look at students as they answered questions. It was also his practice to watch the teacher as he moved around the room. This particular teacher used many strategies apart from specific visual aids which could be regarded as "visual". He used the blackboard a great deal and he was usually very mobile, gesturing and moving around the room in an animated fashion. Thus, many of his instructional practices were suited to a child with a visual preference, if that indeed, were the case with Eric. It is difficult to make definitive statements regarding this aspect of Eric's behaviour, but a visual preference does go some way toward explaining it.

12.3.3 Peer behaviour in relation to time on task and academic engaged time for Eric

Table 12.3 reveals that there were no recorded instances of Eric receiving negative responses from peers (see column 9). Eric was somewhat introverted and was neither a "star" nor an isolate in the class. He had a small number of friends with whom he interacted regularly but he was the quietest member of this group. His closest friend was a highly gifted boy in the Year 5 cohort of the 5/6 composite class.

Table 12.3
Peer Behaviour in Relation to Time on Task and Academic Engaged Time for Eric

1	2	3	4	5	6	7	8	9
ObNo.	LC	M/O	TD	TOT	AET	IIP	IP	NP
1	mathematics	45	high	89%	60%	1	0	0
2	quiz/marking	10	med	100%	100%	0	0	0
3	reading comp	35	high	100%	100%	0	0	0
4	oral reading	20	med	77%	65%	0	0	0
5	watching video	30	low	100%	n/a	0	0	0
6	language/spelling	40	high	100%	100%	1	0	0
7	marking language	20	med	100%	100%	0	0	0
8	peer support disc	20	low	100%	75%	0	0	0
9	mathematics	10	high	100%	100%	0	0	0
10	spelling quiz	25	high	80%	80%	0	0	0
11	transition/compre	40	high	100%	80%	0	0	0
12	language activities	45	high	100%	71%	1	0	0
13	sci-disc/notes	40	high	60%	50%	0	0	0
14	marking homework	15	med	100%	96%	0	0	0
15	Multicult Day org	20	med	100%	n/a	0	0	0
16	dance practice	30	low	100%	n/a	0	0	0
17	reading	20	med	100%	55%	0	0	0
18	speech/language	20	high	100%	78%	0	0	0
19	procedural text	25	med	100%	88%	0	0	0
20	personal devt	30	med	90%	50%	0	0	0
21	personal devt	30	med	84%	60%	0	0	0
		total = 570		mean = 95%	mean = 78%			

Key

LC	lesson content	AET	academic engaged time
M/O	minutes of observation	IIP	initiated positive interaction with peer
TD	task demand	IP	interfered with peer
TOT	time on task	NP	negative from peer

12.3.4 Organisation of the physical environment in relation to time on task and academic engaged time

Table 12.4 displays the relationships between time on task, academic engaged time and aspects of the physical environment. The various components of the physical classroom environment which emerged from the data as being of significance to time on task and academic engaged time were combined into two categories: formality of the classroom setting and planned seating of the target student.

12.3.4.i Formality of setting in relation to time on task and academic engaged time

Eric's classroom was rated as moderate in its formality on most occasions (see column 7). The desks were placed in groups with the eight Year 5 students usually placed together in one group. There was student work displayed around the room, although this was not a feature and the posted items did not change with any great regularity. There were several charts displaying student progress in various activities posted on the walls and a very well supplied reading corner complete with cushions. The room was not highly visually attractive or stimulating.

The students sat in a more informal arrangement when they watched the video (Observation 5) and during the Multicultural day discussion (Observation 15). Most chose to remain in their seats, as Eric did, but a few sat on the reading cushions or on the floor.

Because Eric was on task and engaged for such high proportions of the time it is difficult to determine if formality of the setting was a contributing factor to time on task or academic engaged time.

12.3.4.ii Planned seating in relation to time on task and academic engaged time

Table 12.4 reveals that the extent to which Eric was purposefully placed was rated as moderate on almost all occasions (see column 8). Tables were in groups rather than in more formal rows. The teacher consciously positioned students so that each table group had at least one capable student. This was to provide even competition for the many team games that were played in this classroom. Eric's seating position within the classroom was changed each term and on only one occasion (Term 4) was he placed at the front of the room, as is often recommended for students with a diagnosis of ADHD. One consistent factor was that he was always placed near on-task peers. The teacher demonstrated his awareness of the fact that placement near an on-task peer helped Eric stay on task, explaining his rationale for seating thus:

> I organise the tables, I get them where I want them, and that makes a big difference...You have to spread out the good kids. I put one in each block – that way every block has an equal chance in the quizzes. I sat him (Eric) next to his best mate originally – he was last year's dux, and they work well together. They're both always hard at it. Eric needed to have someone focused near him. That was more important at the beginning of the year, but he'd be OK anywhere now. (teacher interview, 9/12/96)

During the personal development lessons (Observations 20 and 21) the two Year 6 classes were combined in one room but students were free to sit where they wished. Thus, those sessions were rated as being low in terms of planned seating.

Table 12.4

Organisation of the Physical Environment in Relation to Time on Task and Academic Engaged Time for Eric

1 Ob No.	2 LC	3 M/O	4 TD	5 TOT	6 AET	7 FS	8 PS
1	mathematics	45	high	89%	60%	mod	mod
2	quiz/marking	10	med	100%	100%	mod	mod
3	read'g comp	35	high	100%	100%	mod	mod
4	oral reading	20	med	77%	65%	mod	mod
5	watching video	30	low	100%	n/a	low	low
6	lang/spelling	40	high	100%	100%	mod	mod
7	marking lang	20	med	100%	100%	mod	mod
8	peer support disc	20	low	100%	75%	mod	mod
9	maths	10	high	100%	100%	mod	mod
10	spelling acts	25	high	80%	80%	mod	mod
11	trans/compre	40	high	100%	80%	mod	mod
12	lang activities	45	high	100%	71%	mod	mod
13	sci-disc/notes	40	high	60%	50%	mod	mod
14	marking homework	15	med	100%	96%	mod	mod
15	Multicult Day org	20	med	100%	n/a	low	low
16	dance prac	30	low	100%	n/a	mod	low
17	reading	20	med	100%	55%	mod	mod
18	speech/lang	20	high	100%	78%	mod	mod
19	proc text	25	med	100%	88%	mod	mod
20	pers devt	30	med	90%	50%	mod	low
21	pers devt	30	med	84%	60%	mod	low
		total = 570		mean = 95%	mean = 78%		

Key

LC	lesson content	AET	academic engaged time
M/O	minutes of observation	FS	formality of setting
TD	task demand	PS	planned seating
TOT	time on task		

12.3.5 Managing behaviour of teacher in relation to time on task and academic engaged time for Eric

Table 12.5 reveals how different aspects of the teacher's managing behaviour related to Eric's time on task and academic engaged time.

12.3.5.i Monitoring behaviour and teacher redirects in relation to time on task and academic engaged time

Monitoring behaviour was judged to be moderate or high on most occasions (see column 7). It was the teacher's practice to circulate around the room during most

seatwork activities if he was not teaching the other grade level in the composite class. He would often watch particular students complete the first exercise. The field note summary at the end of this section provides examples of the teacher's monitoring behaviour in combination with other managing behaviours.

The teacher also marked work regularly, usually while the students were working on the task. This allowed him to monitor work completion, setting out and even such things as book tidiness. Eric's teacher confirmed this as a conscious strategy during his interview:

> His (Eric's) bookwork used to be very messy. You had to keep onto him about that all the time. I made him do it again if it was messy, and he knows that now. I tell him, *"I know you can do better. It would be different if that's all you were capable of"*....I'm onto them a fair bit. I check the (reading) charts and say, *"Right – you haven't got a lot (of books recorded) – lift your game."* (teacher interview, 9/12/96)

Eric's teacher was aware of the need to make his students accountable for their actions. Untidy work had to be redone, but even this demand was made in the context of *"I know you can do better"*.

Eric was not redirected to task during any of the observation periods (see column 8). This seemed consistent with his very high average time on task: he did not require redirection. Eric's teacher expressed an awareness of the importance of monitoring:

> Eric's right as long as he knows I'm there, encouraging him and asking how he's going. He needs regular encouragement. And you have to make sure that he can do the work – that's fair enough for all kids. (teacher interview, 9/12/96)

These comments reflected both an understanding that his own presence had a monitoring effect on Eric and also that Eric needed encouragement.

12.3.5.ii Use of explicit language in relation to time on task and academic engaged time

The teacher's language was rated as highly explicit on most occasions (see column 9). Directions in the classroom were usually clear and sequenced and followed up by written instructions on the board. In Observation 6 a teacher language rating was not applicable because most time was spent teaching the Year 5 cohort while Eric's cohort worked through spelling activities. It would appear in Eric's case that the use of explicit language was related to high levels of TOT and AET (see column 9 in relation to columns 5 and 6).

12.3.5.iii Positive interactions with target student in relation to time on task and academic engaged time

Eric regularly received positive comments from the teacher (see column 10) as did the other students. This was a strong feature of the classroom. The teacher consciously worked at making the classroom a supportive emotional environment:

> I praise kids in front of the class – I check whose birthday it is so I can make them feel special – everyone deserves that. I try to make the class fun for them. They like their nicknames, too – it's like having a personal secret with each individual....I give marks for effort and for individual improvement. Not all kids can come top. They know some people are good at some things. I show kids I'm not good at everything. I'm a bad artist. They laugh when I try to draw something on the board but that's OK. I try to show them trying's important and that no-one's good at everything. (teacher interview, 9/12/96)

Eric responded extremely positively to the class teacher who was popular with all his students. His teacher confirmed Eric's mother's view of Eric as an extremely intense boy, describing him as *"very competitive in everything he does – he's all heart – he puts his body on the line"*, but his teacher believed that Eric was too demanding of himself and became unreasonably upset when he didn't achieve to the level he desired.

12.3.5.iv Evidence of routines in relation to time on task and academic engaged time

Strong routines were evident in Eric's classroom most of the time (see column 11). These were established in Eric's room from early in the year. The first classroom observation visit was in early March, and field notes made reference to the extent to which the students were already operating according to set routines when gathering equipment, collecting marked work, requesting assistance, distributing materials, changing for sport, and so on. Students had several organised options if finished early.

The existence of routines was also evident during transition periods. Most transitions were managed through a series of class quizzes, spelling bees, tables races and so on. As soon as the "Play of the Day" was mentioned, students moved to set positions in order to score points on the board or to do whatever was required. The class was ready to play within approximately ten seconds. There was an emphasis on team scores where all individuals were able to score points for their team. Questions were individualised so that each member had an equal opportunity to contribute. Thus, the student on an individual spelling program was only asked "his" words, and so had as much chance as anyone of contributing points for his team. These transition activities usually lasted about three minutes, after which the next lesson proceeded very quickly. Such activities were very popular with the students. On several occasions during observation periods the students opted to remain in the classroom well after the bell had gone in order to finish a "round".

As the teacher expressed it:

> They know what's expected of them and they know when to do what. They know the systems for "Sale of the Century" and "Buzz Off" and for "Quick Quiz". They all know what to do when they're finished their work. (teacher interview, 9/12/96)

A lengthy but relevant extract from field note summaries provides further examples of several of the management strategies used by the teacher in addition to teaching strategies which are relevant to the findings in the following section.

> **Wednesday 7/8/96 12.50 - 1.25**
> [The Year 6 cohort was transitioning from one lesson to another when I entered, while the Year 5 students were completing a language activity. Eric was ruling up his book in readiness for the next (maths) lesson.]
>
> The teacher conducted a quick tables quiz for the Year 6 group in which Eric and the rest of the class participated very keenly. The teacher then revised a maths procedure he wanted them to practise. Eric followed the teacher's calculations on the board and responded correctly when asked a question. The teacher then asked for questions and when there were none he instructed them to do a certain exercise, which was written up on the board, in their maths book.
>
> Eric began work immediately. The teacher moved directly to a student who has difficulties in the mathematics area and watched as he did the first one, commented positively on the fact that he followed the procedure correctly and moved on, watching as different students completed different exercises.
>
> When the class had been working for four minutes, a boy from the other Year 6 class entered to show something to the teacher. The teacher directed his class to continue with their maths before addressing the student who had just entered. *"Get on with it you lot – this is my business, not yours"* was how he expressed this when several students looked up when the student entered. Although this

sounds a bit gruff, it was said in his usual bantering style and all the students put their heads down again.

The student who had entered the room had defaced his book and had been sent for a reprimand. The teacher said that unfortunately he (the student) would not be able to join the fitness session planned for later that day because of the incident. (The fitness session which Eric's teacher conducts with all Year 6 students is very popular and is often used to motivate the students).

The boy then left the room and the teacher returned to monitoring the room, addressing different students with comments like *"Are you all right, Coconut?", "OK, Lizard?"* and *"What number are you up to, Dibby?"*

Eric appeared to finish his exercises and spoke momentarily to his neighbour before taking out his mentals book, which is what they were meant to do when they finished.

The teacher approached Eric and said, *'How did you go with number four* (of the original exercises – apparently a difficult one)? Eric replied, *'I had to leave that one out.'* Eric listened and watched as the teacher went through it in his book, then Eric continued with the mentals until the teacher marked the original exercises seven minutes later. Throughout the marking, the teacher drew relevant diagrams on the board to explain each question.

This summary identifies a number of different teaching and management principles:

- Transition time between lessons, traditionally a great waster of academic engaged time, was used to revise table facts, setting the scene for the following mathematics lesson and maximising effective use of those few minutes when students were completing one activity and getting organised for the next. Those students who were efficient in this process were advantaged by being able to participate in the quiz and thereby earn points for their group rather than being disadvantaged by having to wait for the tardy members of the class.

- The teacher then reviewed material which he wanted the class to practise. *"They're not too bad at this, but it needs a bit more work"*, was how he expressed it in the informal post observation interview. The quick review is part of the effective teaching cycle put forward by Rosenshine and Stevens (1986) and others.

- A demonstration of the procedure was completed on the board, thus providing a worked example for the students' reference, another recommended instructional procedure. Direct questioning of the student group throughout this process also assisted in the identification of any students who were still having difficulty.

- The exercise number was written on the board so that students who missed or who had forgotten the oral instruction had access to the information.

- The teacher began monitoring immediately, targeting a student whom he believed needed additional guided practice to ensure that he was able to carry out the procedure correctly. This was followed up by positive reinforcement and feedback which confirmed and reinforced what he had done correctly.

- The entry of a student from another class also revealed aspects of effective teaching. Before attending to him, the teacher reminded his students to stay focused on their work. The fact that this student was sent from the other Year 6 teacher (who had more than twenty years experience) to Eric's teacher (who was only in his second year of teaching) for a reprimand revealed that other staff members also recognised Eric's teacher's expertise. A combined fitness activity conducted by Eric's teacher, which was very popular, was used as a type of currency in the senior classes.

- The fact that the teacher then asked specific students who were on task how they were going could be seen as an unnecessary distraction. Alternatively, it could be seen

as rewarding on-task behaviour with a brief moment of recognition and the assurance that their progress was still being monitored.

- The fact that Eric moved on immediately to another activity when he had completed the set task highlights the fact that "early finisher" tasks had been identified in this classroom which further reduces the likelihood of off-task behaviour. The existence of routines and procedures such as these have been regularly identified in the effective teaching literature as those which promote academic engaged time.

- The teacher also predicted accurately a question which would cause difficulties for Eric which reveals the extent to which he is "in tune" with individual understandings and abilities.

In terms of managing the classroom, Eric's teacher had a clear perception of his role in the classroom:

> I like being in control. I can tell if they look sideways and they know it. I have a lot of jokes with them about what will happen if they muck up. They know I'd never touch them but I talk about 'Frank the Fist," "Billy the Boot", and "Wally the Whacker" all the time. I like to have fun but they realise when I'm the teacher and when I'm not. (teacher interview, 9/12/96)

Table 12.5

Managing Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Eric

1 ObNo	2 LC	3 MO	4 TD	5 TOT	6 AET	7 MB	8 TR	9 DL	10 PI	11 R
1	mathematics	45	high	89%	60%	mod	0	high	2	high
2	quiz/marking	10	med	100%	100%	high	0	high	3	high
3	read'g comp	35	high	100%	100%	high	0	high	1	high
4	oral reading	20	med	77%	65%	high	0	high	2	high
5	watching video	30	low	100%	n/a	high	0	low	1	mod
6	lang/spelling	40	high	100%	100%	high	0	n/a	0	high
7	marking lang	20	med	100%	100%	high	0	high	1	high
8	peer support disc	20	low	100%	75%	mod	0	high	2	mod
9	maths	10	high	100%	100%	mod	0	high	0	high
10	spelling acts	25	high	80%	80%	high	0	high	2	high
11	trans/compre	40	high	100%	80%	mod	0	high	0	high
12	lang activities	45	high	100%	71%	high	0	high	0	high
13	sci-disc/notes	40	high	60%	50%	high	0	high	1	high
14	marking homework	15	med	100%	96%	high	0	high	1	high
15	Mult Day org	20	med	100%	n/a	high	0	high	0	mod
16	dance prac	30	low	100%	n/a	high	0	high	2	mod
17	reading	20	med	100%	55%	high	0	high	1	high
18	speech/lang	20	high	100%	78%	high	0	high	1	high
19	proc text	25	med	100%	88%	low	0	?	0	mod
20	pers devt	30	med	90%	50%	high	0	?	0	low
21	pers devt	30	med	84%	60%	high	0	?	0	low
		total = 570		mean = 95%	mean = 78%					

KEY

LC	lesson content	TR	teacher redirection
M/O	minutes of observation	DL	direct language
TD	task demand	PI	positive interactions with target student
AET	academic engaged time		
TOT	time on task	R	use of routines
MB	monitoring behaviour	?	data not observed or not recorded

12.3.6 Instructional behaviour of teacher in relation to time on task and academic engaged time for Eric

Table 12.6 shows associations between Eric's time on task, academic engaged time and the instructional behaviour of the teacher.

12.3.6.i Level of demonstrations in relation to time on task and academic engaged time

Table 12.6 reveals that demonstrations provided by Eric's teacher were rated as highly explicit and they were used regularly for formal work (see column 7). They were nearly always accompanied by visual aids or by use of the blackboard. Worked examples of mathematics algorithms were left on the board for reference while exercises were completed and these were regularly used by Eric and many other students. Even the marking of homework was accompanied by demonstrations of worked examples on the board.

12.3.6.ii Level of task setting in relation to time on task and academic engaged time

Task setting was also highly structured in almost all academic lessons with explicit instructions on what was to be done (see column 8). In Observation 19 students had been instructed to write down the instructions to play a game or use a toy. Several examples were worked through with the teacher the day before this observation and they were still on display for the students' reference. Part of their homework was to select a toy or game and prepare some instructions which were to be finalised next day. Eric had clearly prepared this carefully at home the previous night and produced well set out instructions on how to perform a range of different activities with a yo-yo.

12.3.6.iii Direct teacher approach/assist behaviour in relation to time on task and academic engaged time

The teacher approached and/or assisted Eric in most observed lessons and he often did this more than once (see column 9). This was another strong feature of the teacher's behaviour. He monitored almost constantly during seatwork which meant he was able to observe when students were having difficulty. He also had a good understanding of

the ability level of each student and could often predict where particular students would have difficulty.

12.3.6.iv Maintenance of momentum in relation to time on task and academic engaged time

Momentum was rated as moderate or high for almost all lessons (see column 10). The teacher directed almost all activity within the classroom and maintained interest and involvement of the class through the use of questioning, his encouragement of their questioning and comments aimed at particular individuals. Opinions expressed in the formal interview explained his rationale:

> I encourage them all to ask questions. I trumpet that all the time - "a stupid person doesn't ask questions; a smart person asks for help". I ask them all the time "What do you do if you've got a problem?" I get them to chant, "Ask for help".
>
> But that means you have to get to them pretty quickly if they need help. If I'm helping one and I see another hand up, I tell them I'll be there in a sec. I make sure they never have to wait long. And you have to make sure that they can do the work - if it's too hard, you're going to have so many hands up you can't cope. If more than three kids have trouble with the same question, I do it on the board. That means they don't basically understand so I go over the whole thing with the class again.
>
> I give each kid I help a few questions on a Post-it (small sticky piece of paper for short notes) like the one they couldn't do for homework. Homework on a Post-it doesn't seem like much homework and they seem to like it. Not many get lost - that's a bit of a surprise really. (teacher interview, 9/12/96)

The following extract from field note summaries revealed a number of ways in which the teacher maintained momentum throughout lessons:

Wed, 13/11/96 10.30 -11.00

Both classes were involved in oral reading of a school magazine story when I entered. Different children were chosen to read and the teacher made brief positive comments after each one, commenting on such things as expression, word knowledge, word attack skills demonstrated, and so on. Eric was chosen to read and he did so clearly and with appropriate intonation. He managed difficult words like "contrary" but had difficulty with "sulky", which the teacher helped him to sound out.

At the end of the story (10.40) the teacher led a discussion on country life (related to the story) and several of the quieter children spoke of their experiences in the country. The whole class was soon drawn into this discussion with many students wanting to volunteer information and/or anecdotes.

At 10.45, the teacher announced *"Speeches"*, which involved students speaking in front of the class with no preparation for one minute on a random topic. (These topics were selected from a box of topics submitted by class members as an early finisher activity. The teacher had power of veto if he thought the topic was too personal or too difficult.)

After each child spoke the class could make comments or ask questions. This was managed in a very directed manner by the teacher so the momentum of the activity did not falter. The teacher would then provide brief specific feedback, commenting on fluency, posture, pace, eye contact, use of humour, and so on. He would involve the class in this, asking such questions as, *"Were you able to hear him clearly from your seat, Lauren?"*

Just as this was concluding the principal entered to remind children to give their Basic Skills results to their parents when they received them the next day and he engaged in a little banter with the teacher and several students. This lasted until the bell went five minutes later.

Within this extract, there are several different instructional practices which contributed to the maintenance of momentum in the above extract:

- The classroom was strongly teacher-directed: the teacher was "in charge". He decided who would be doing what, and when it would occur. The individual needs of the children were the focus of classroom activity but these were met through teacher direction rather than through student direction. The classroom was student-centred but not student-directed.

- During the discussion period following the oral reading the teacher's skill at directing questions ensured that a wide range of students participated. He was able to specifically target quieter students because of his knowledge of the students and their backgrounds. This was revealed in a brief discussion after this observation period, when the teacher mentioned

> I chose this story (about the country) from the magazine because I knew Milo would have something to say – he used to live in Hay (a country town in New South Wales) and he needed a chance to say something – he's a bit quiet. Kylie, too – she spent time out west so she could make a contribution.

- The teacher's skill at directing classroom activity ensured that the momentum of the lesson was maintained. Six children gave speeches and received feedback within a ten minute period. Classroom activities such as student speeches, particularly those given by primary-aged students run the risk of becoming laborious and monotonous for those students not directly participating. The brisk pace maximised the likelihood that the rest of the class remained engaged in the process.

12.3.6.v Frequency and type of feedback in relation to time on task and academic engaged time

Feedback was regular and highly process-oriented (see columns 11 and 12). The previous extract provided a good example of this. Eric's teacher commented on such specifics as expression, pronunciation, and use of word analysis, and thus provided precise information on what the students did well and where they could develop their skills. This type of feedback is strongly correlated with maximising student outcomes. The teacher's ability to involve other students in individual feedback (*"Were you able to hear him clearly from your seat, Lauren?"*) also ensured that a greater number of students maintained engagement in the classroom activity.

Table 12.6

Instructional Behaviour of Teacher in Relation to Time on Task and Academic Engaged Time for Eric

1 Ob No	2 LC	3 MO	4 TD	5 TOT	6 AET	7 Dem	8 TS	9 TAA	10 MM	11 FF	12 PF
1	mathematics	45	high	89%	60%	high	high	4	high	high	high
2	quiz/marking	10	med	100%	100%	n/a	high	n/a	high	high	high
3	read'g comp	35	high	100%	100%	high	high	2	high	mod	high
4	oral reading	20	med	77%	65%	high	high	3	mod	high	high
5	watching video	30	low	100%	n/a	n/a	low	1	?	n/a	n/a
6	lang/spelling	40	high	100%	100%	high	high	0	high	high	high
7	marking lang	20	med	100%	100%	high	high	3	high	high	high
8	peer supp disc	20	low	100%	75%	high	mod	3	high	n/a	n/a
9	mathematics	10	high	100%	100%	high	low	0	high	low	low
10	spelling acts	25	high	80%	80%	n/a	high	1	high	high	high
11	trans/compre	40	high	100%	80%	n/a	high	0	high	mod	?
12	lang activities	45	high	100%	71%	high	high	2	high	high	high
13	sci-disc/notes	40	high	60%	50%	high	mod	1	mod	high	high
14	marking homework	15	med	100%	96%	high	high	4	high	high	high
15	Mult Day org	20	med	100%	n/a	n/a	high	2	mod	n/a	n/a
16	dance prac	30	low	100%	n/a	high	mod	1	mod	n/a	n/a
17	reading	20	med	100%	55%	high	mod	2	mod	mod	high
18	speech/lang	20	high	100%	78%	n/a	high	2	high	high	high
19	proc text	25	med	100%	88%	n/a	high	0	mod	?	?
20	pers devt	30	med	90%	50%	n/a	low	0	mod	?	?
21	pers devt	30	med	84%	60%	n/a	low	0	mod	?	?
		total = 570		mean = 95%	mean = 78%						

Key

LC	lesson content	TS	level of task structure
MO	minutes of observation	TAA	teacher approached/assisted target student
TD	task demand	MM	level of momentum
TOT	time on task	FF	frequent feedback
AET	academic engaged time	PF	process feedback
Dem	teacher demonstration	?	data unavailable or not recorded

12.4 SUMMARY OF DATA RELATING TO ERIC

Eric consistently scored high percentages of TOT and AET, even on high demand tasks, although low demand tasks scored slightly higher on average. Eric did not demonstrate the behaviours characteristic of a student diagnosed with ADHD apart from poor organisation and untidy bookwork. Even during transition periods he was consistently on task. Eric actively participated in class activity but did not interfere with

peers or, indeed, interact with them to any great extent. There were no recorded instances of negative peer responses to him. There was some evidence that he imitated peers when unsure of what to do. There was also some evidence of a preference for visual stimuli on Eric's part.

Moderate to high levels of formality existed in Eric's classroom. The teacher directed most activity. He engaged in moderate to high monitoring of classroom activity but issued few redirects. All students, including Eric, received regular positive comments from the teacher. Strong routines were also a feature of the classroom.

The teacher's instructional behaviour incorporated highly explicit demonstrations which were often supported by visual aids and structured task setting. He regularly approached and directly assisted Eric. The classroom was characterised by high levels of momentum and regular process feedback. These factors were regularly associated with high levels of TOT and AET.

The extracts recorded in this chapter have illustrated a significant number of recommended practices for both effective teaching and for teaching students with ADHD. It appeared from the data that Eric's teacher was highly effective in assisting Eric to remain on task and engaged in class activity of all types. The data also revealed that Eric enjoyed considerable support from home, with such practices as providing structured routines and organisational cues also occurring in the home environment.

12.5 EMERGING TRENDS

As this research progressed it was extremely difficult to continue to perceive Eric as a student at risk of learning and behavioural problems through a diagnosis of ADHD. Eric's diagnosis was the result of recommended diagnostic procedures although it should be remembered that different levels of severity exist, and it is possible that Eric's

ADHD is situated at the milder end of the continuum. Nevertheless, his early diagnosis of mild developmental delay, his later diagnosis of ADHD and his placement in the Intensive Reading class just two years prior to this research were increasingly difficult to assimilate into the emerging picture of Eric. It appears that it is possible for a student with a diagnosis of ADHD to participate in a highly successful manner in a regular classroom. Just how this eventuates, and what elements contribute to this, are the foci of the thesis.

Task factors appeared to be important. Eric's teacher sought to make them relevant and achievable. Most of the classroom activity could be classified as molar activity because of the level of motivation demonstrated by Eric and his peers. Eric's apparent resistance to distraction and high completion rate of set tasks also suggested that the learning activities within the classroom could be characterised as molar.

The class setting, while only moderate in formality, appeared to contribute to on-task behaviour. While not as formal as that identified in the Intensive Reading classroom where Ricky experienced highest engagement, at least moderate levels of formality were consistently present.

The teacher's management and instructional practices, which were highly consistent with the effective teaching practices outlined earlier in this thesis and with those practices observed during periods of high engagement of other target students in this thesis, appeared to be closely linked to Eric's high level of engagement. There was strong teacher direction of activity, structure, routine, and use of direct language. Momentum appeared to be a major factor as did the use of frequent and elaborated feedback.

Something else also appeared to be operating in Eric's classroom. While a sense of warmth and caring was evident in all classrooms and was certainly espoused as

important by all teachers in this study, the sense of combined purpose, of energy and of enthusiasm for learning which permeated Eric's classroom has not been satisfactorily explained, but certainly appears to be connected to the affective tone of that classroom.

In Bronfenbrenner's (1979) terms, Eric and his teacher could be seen to have formed a developmental dyad. Eric and his teacher appeared to work together toward common goals. They shared warm and positive feelings for each other. Responsibility for Eric's learning could be seen to have moved from the teacher to Eric as he was able to manage his own behaviour most of the time.

The developmental dyad of Eric and his teacher was strengthened by the support of other significant people within the mesosystem such as Eric's parents. The consistency of the approaches used appeared to be of great advantage to Eric who had developed from being a student who struggled with grade level material (hence his allocation to an IR class) to one of the top achievers in the class. The factors that contributed towards this transformation were complex.

It appeared that in Eric's learning environment the interaction of various elements were such that Eric could function in his role as a student and his teacher could fulfil his role as a teacher. Those factors relating to elements of the immediate classroom ecology and other more broadly based environmental influences which contributed to effective learning environments for Eric and for other target students will be drawn together in the final two chapters of this thesis.

CHAPTER THIRTEEN

CONCLUSIONS AND DISCUSSION EMERGING FROM THIS THESIS

Bronfenbrenner's (1979) ecological model posits that in order to understand individual behaviour there must be some understanding of the interactions within the various systems surrounding that individual. This thesis has examined some of the relationships that exist in classrooms in order to determine those factors which contribute to the most successful educational experiences for students with ADHD.

In this chapter the major trends emerging from the five case studies are presented in response to the research questions posed in Chapter One. In order to synthesise the results and provide a platform for the discussion, cross-case displays were prepared. These provide an overview of those elements of the classroom ecology which were associated with high percentages of time on task and academic engaged time. Because of the mass of data, the *time on task* information is more easily reviewed in three separate tables, which are included as Appendix G:

- Table G1 presents summary information concerning the two Kindergarten target students, Kyle and James;
- Table G2 presents summary information concerning the target students from Years 3 (Ricky) and 4 (Mitchell); and
- Table G3 presents summary information concerning the Year 6 target student, Eric.

Each of the time-on-task tables summarises information relating to those observations during which the students were on task 70% or more of the time: a total of three observations for Kyle; eighteen for James; seventeen for Ricky; three for Mitchell and twenty for Eric. The observations for each of the students have retained their original

number to facilitate reference to the original tables if required. As stated in the literature review, time on task is an important measure because even if not academically engaged to a high degree, when students are essentially doing what is required of them in the classroom and not interfering with other students, it is of benefit to all class members (Cooper & Ideus, 1995; Pelligrini & Horvat, 1995).

What is perhaps of even greater significance for the purposes of this thesis is an understanding of those elements which are associated with high levels of *academic engaged time*. Appendix H provides an overview of the elements associated with the classroom ecology for each target student when academic engaged time was rated as 70% or above on tasks of medium or high demand. Academic engaged time is essentially a subset of time on task: those periods when the students were not only on task, but engaged in academic activity. There were far fewer periods of high levels of academic engagement than there were periods of time on task. There was only one such observation period with Kyle, James and Mitchell, five with Ricky and eleven with Eric.

The discussion in this chapter will simultaneously address the major elements of the classroom ecology which were associated with both high levels of time on task and academic engaged time. What was of particular interest for the purposes of this thesis was the nature of the classroom relationships under conditions of *optimal engagement in high demand tasks*. Tasks of high demand include those which centre on the learning of basic skills such as reading, spelling, writing and mathematics. An understanding of what maximises engagement in such tasks is crucial if teachers are to facilitate the core educational experiences of students with ADHD.

The literature review provided in this thesis revealed that difficulties with these academic subjects are commonly linked to the condition of ADHD. If there is evidence that certain classroom relationships, practices and strategies are more likely to be

associated with high levels of academic engaged time for students with ADHD, this information should contribute to an understanding of how the educational experiences of these students may be optimised. The major findings from this study have been framed as responses to the research questions posed in Chapter One. Factors consistently associated with high levels of academic engaged time in this study are summarised as dot points at the end of each section.

13.1 RESPONSE TO RESEARCH QUESTION 1

How do the core characteristics of Attention Deficit Hyperactivity Disorder impact on learning and behaviour?

If the documented relationship between academic engagement and learning (as explored in Chapter Three) is accepted, it is clear that for all students in this study apart from Eric, learning was affected by behaviours associated with their diagnosis of ADHD. Manifestation of the core characteristics of ADHD had the effect of limiting time spent engaged in learning activities. High levels of attention problems, impulsivity and hyperactivity were consistently associated with lower levels of both time on task and academic engaged time.

The converse was also true. When students were on task at least 70% of the time, behaviours associated with ADHD were not evident to a high degree. Out of a possible 61 observations periods which scored 70% or more time on task across all target students, on only one occasion were attention problems rated as high (James, Observation 12); on only two occasions were impulsivity problems rated as high (Ricky, Observations 10 and 27); and on no occasions were hyperactivity problems rated as high. On-task behaviour did not coincide with significant manifestation of ADHD-type behaviours.

Similarly, throughout the nineteen observation periods when AET was 70% or more, there were no recorded instances of high levels of ADHD behaviours. Ricky (when

with Hilary) and Eric scored particularly high percentages of academic engaged time in addition to high percentages of time on task in many lessons.

This suggests that behaviours associated with ADHD are suppressed, or in some way "managed" under those conditions that promote high levels of time on task and academic engaged time. Having some understanding of what those conditions might be should lead to a greater understanding of how teachers can organise the learning environment for students diagnosed with ADHD. These conditions appear to be related largely to factors under the teacher's control, such as organisation of the physical environment, classroom management and instructional strategies.

Hyperactive behaviour was far more pronounced in some target students (chiefly James) when they were not medicated. Medication, however, was not the only factor which decided on- or off-task behaviour. Ricky provides the best avenue of discussion of this point. As far as was determined, he did not miss taking his medication throughout the observation period. His behaviour in the composite classroom varied greatly from that observed in the IR room. The smaller class size in the IR room could well have been a factor of some significance in supporting on-task behaviour, as could the narrower focus of activity in that room, but average AET and TOT for Ricky's time with Jacqui in the composite classroom (with 31 students) and his time with Rose in the IR room (with 6 students) were quite similar. Other factors such as those related to classroom management and instructional strategies appeared to be of more importance.

The varied behaviour of Ricky when with Hilary compared to when he was with Cheryl supports the views of Pelham et al (1985) and Evans et al. (1995) who found that medication effects in children with ADHD could either be augmented or diluted by other factors. In Hilary's classroom the strong teacher direction and high level of structure appeared to augment the effect of medication in assisting Ricky to remain on task. In

Cheryl's classroom these factors were not present and so the effect of the medication was diluted, making it less effective in assisting Ricky to remain on task.

The use of individual attention-maintaining strategies appeared to be successful for some students with ADHD. Two students in this study seemed to develop mechanisms by which their propensity to fidget and move excessively was managed on occasions through repetitive body movements, such as swinging legs through the air, while engaged in a task. There were not many examples of this but when they did occur, engagement levels were high. Self-talk also appeared to be of assistance in keeping some students with ADHD in this study engaged in higher demand tasks.

In summary, when students were on task or academically engaged to a high degree, there was

- low manifestation of ADHD behaviours.

13.2 RESPONSE TO RESEARCH QUESTION 2

How does the nature of the learning task affect the time on task and academic engagement of students with ADHD?

Tasks of low, medium and high demand all resulted in ratings of 70% or more TOT on some occasions but not on others, revealing no consistent relationship. Krupski (1985) suggested that students with attention problems were more able to remain on task when the task was of low demand but this research did not totally support that view. Task demand per se was not a major factor in determining the extent to which these students would remain on task. Other factors related to task match, classroom management and instructional strategies emerged as being of greater significance.

Ricky's classrooms incorporated tasks of greater academic demand and therefore a greater overall academic focus when with Hilary and Rose. This would be expected in a specialist class for students with identified reading difficulties. Eric's class had a high

proportion of higher demand activity and was therefore considered to be highly academically focused. Both Ricky (when with Hilary) and Eric scored consistently higher TOT and AET percentages than the other students in this study. Thus, the expected trend for lower engagement in higher demand tasks (Krupski, 1985) was not generally supported in this research. Tasks that demanded volitional attention and higher cognitive processes were just as likely to engage students with ADHD. This may be because when higher demand tasks were set by Hilary and Eric's teacher, the environment was structured in a more formal manner than for lower demand tasks, thereby assisting the students to engage in, and remain engaged in, the task. This supports the literature which found that an academic focus was consistently related to high levels of academic engaged time (Dunlap, Gleason, & Waugh, 1982; Rosenshine & Berliner, 1978; Rosenshine & Stevens, 1986; Yates, 1988) and to increased academic gains in basic skills subjects like reading and mathematics (Brookover & Lezotte, 1979; Crocker, 1986; Dunlap et al., 1982; Ellis, Worthington, & Larkin, 1994; Fitzpatrick & McGreal, 1983).

Only one factor was present for *every* period of time on task over 70%: *task match* (see Appendix G1, G2, and G3, column 2). This suggests that task match was a critical factor in determining whether or not the student diagnosed with ADHD was able to remain on task. It appeared that if a set task matched the student's interest and ability level, on-task behaviour ensued. Apparently all teachers have to do in order to keep students with ADHD on task is to ensure a close match between student ability and interest and the designated task.

Task match, although at first glance a straightforward notion, incorporates a combination of elements. It demands that the teacher has a clear understanding of student ability in setting the task. It demands that the student has the prerequisite knowledge and skills to complete the task. It demands that necessary resources are available. It demands that the student is motivated to complete the task. It demands, in

fact, that the task would be classified in Bronfenbrenner's terms as a molar activity: one that is personally meaningful, resists interference and is likely to be completed successfully. Even organisational activity would be so classified if the student was motivated enough through, for example, a strong desire to please the teacher, to complete the task.

Therefore, while superficially quite straightforward, task match is a complex notion and successful student/task match requires a range of skills on the part of the teacher. These skills are perhaps not as easily acquired or as prevalent among practising teachers as desirable, hence the continuing difficulties associated with students with ADHD in classrooms.

There is also supporting evidence of the importance of task match when analysing those periods of very low engagement. Mitchell's consistent lack of engagement could have been related to an inappropriate match between set tasks and his ability level. Much activity in Mitchell's classroom involved copying material from an overhead, illustrating or sentence completion. The fact that Mitchell rarely engaged in such activities could well reflect their limited appeal to a student in the above average range of ability.

These findings support the literature which states that matching instructional tasks to the ability level of students is a critical feature of effective teaching (Christenson, Thurlow, & Ysseldyke, 1987; Crocker, 1986; Dunlap et al., 1982; Ellis et al., 1994; Haig, 1987; Hudson, 1997; Scruggs & Mastropieri, 1992). This has also been specifically recommended for students with ADHD (Bailey & Rice, 1997; Barkley, 1990; Bender & Mathes, 1995; Fiore & Becker, 1994; Goldstein, 1995; Reid, Maag, & Vasa, 1993; Schwean, 1993; Yehle & Wambold, 1998).

From an analysis of the data relating to the task dimension of the learning environment, the following factors emerged as being of significance in promoting high levels of TOT and AET:

- an academic focus with high demand tasks; and
- student/task match.

13.3 RESPONSE TO RESEARCH QUESTION 3

How do peer interactions affect the classroom behaviour and learning of students diagnosed with ADHD?

It was evident from the AET results that when academically engaged to a high level, the students with ADHD *were not interacting either positively or negatively to any great extent with their peers* (see Appendix H, columns 8, 9 and 11). This suggests that students were not involved in group activities, in which case one would expect many instances of peer interaction to have been noted. Reference to the raw data reveals that in most cases high percentages of academic engaged time occurred when the lesson was being directed strongly by the teacher, or when highly structured independent seatwork followed a strong teacher demonstration. This supports the literature which found that a strongly teacher-directed classroom facilitates time on task and academic engaged time (Askew, 1993; Bender & Mathes, 1995; Christenson et al., 1987; Dunlap et al., 1982; Frudden & Healy, 1986; Gettinger, 1986; Hudson, 1997). Most students in this study were not able to remain on task when involved in group tasks or when engaged in seatwork that was not highly structured or closely monitored. This was particularly the case when the tasks were of high demand and required high levels of volitional attention and cognitive processing.

With the amount of class time which current observation and anecdotal evidence reveals is spent in group work, it is perhaps timely to consider the fact that it was not during these periods that the students with ADHD were most on task. Successful small group work demands many skills of students, skills that students with ADHD do not easily

acquire. Being seated opposite and beside other students involved in shared activity provides many opportunities for a student with ADHD to move off task. The social and co-operative benefits of these activities are well acknowledged but this research supports the view that students with ADHD do not have the necessary skills to engage successfully in them.

Should this then result in a recommendation that students with ADHD should not participate in group work? Considering the benefits of group work, this question should almost certainly be answered in the negative. It may well be advantageous for students with ADHD that time be spent training them in the complex skills that are required for successful group work, rather than assuming that students with poor attention skills and limited ability to control and direct their executive processes already have these relatively sophisticated skills.

It may also be, however, that a greater percentage of class time should be spent in more teacher-directed activity than is currently the case in many classrooms. This would appear to be most helpful for students with a diagnosis of ADHD on those occasions when difficult new concepts are being introduced and practised. This research suggests that classrooms in which group work is the sole mode of learning would be just as ineffective as a classroom in which students never co-operate within groups, especially for students who do not have the requisite skills.

This research also found that periods of high TOT and AET were noted for their comparative absence of negative interactions between peers. When the students with ADHD were on task, they rarely (twice out of a total of 60 periods of on-task behaviour of 70% or more) interfered with their peers, nor did they receive negative responses from their peers. Again this demonstrates the great benefits of keeping these students on task: the class is a more peaceful and productive place when students with ADHD

are doing what is required of them. Students with ADHD do not interfere with the learning of their peers when they themselves are behaving as directed in the classroom.

Some teachers participating in this research used same-age or older students to assist in their classrooms. At Kyle's school it was common practice for Year 6 students to assist in the Kindergarten classrooms for craft and some other lessons, and when classes of junior students were involved in group activities. These peer tutors were singularly unsuccessful in keeping the students with ADHD on task. In several of the combined dance sessions observed, a Year 6 student would attempt to assist three or more Kindergarten students in a small group. The students with ADHD did not manage successfully in those situations. Students, even Year 6 students, did not have the skills to keep these students engaged in the required tasks. This supports the proposition that students with ADHD need a teacher rather than a peer to assist them in remaining engaged in an activity.

There is, however, substantial research which supports the view that peers can be highly effective in assisting the learning of students with learning problems (Barry & Overmann, 1977; Guralnick & Groom, 1987; Kotkin, 1995; Martella et al., 1995). This suggests that if peers are going to be used to assist students with ADHD, peer training programs need to be implemented. Training of peer tutors has been found to greatly increase the effectiveness of peer tutoring programs (Jenkins & Jenkins, 1987), therefore this would seem to be a valuable way in which learning can be maximised.

A trend for the Kindergarten students to imitate their peers when unsure of what to do emerged in this study. Imitating peer behaviour occurred in more than 50% of the periods of high TOT (see Appendix G1, column 10) and was often done in preference to requesting assistance from their teacher. Peers do, therefore, have the potential to facilitate the on-task behaviour of students with ADHD. The importance of purposively placing young students with ADHD near on-task peers in order that they have an

appropriate person to model for them has been highlighted by this study. There is substantial research (Michelson & Mannarino, 1986; Perry & Furukawa, 1980; Schneider & Byrne, 1985; Schunk, 1987; Schunk, Hanson, & Cox, 1987) that suggests that models of certain types are more effective than others. Models of high status in the peers' eyes but of similar age who are rewarded for their on-task behaviour provide the most effective peer models.

From an analysis of factors relating to peer interaction, the following factor was associated with high levels of TOT and AET:

- low levels of peer interaction.

13.4 RESPONSE TO RESEARCH QUESTION 4

What physical classroom arrangements lead to increased time on task and academic engaged time for students with ADHD?

The formality of the physical environment was not consistently associated with on-task time when students were engaged in *low demand* activities. This trend was quite different from that noted when the students were engaged in more demanding activity. *Once the demand of the task increased, at least moderate levels of formality and structure appeared to facilitate engagement.* Classroom settings of moderate to high levels of formality existed on eighteen of the nineteen occasions that engagement in tasks of higher demand were recorded (see Appendix H, column 12). Academic engaged time, therefore, appeared to be facilitated by at least moderate levels of formality of the setting for students with ADHD.

On the same number of occasions there was also some consideration of specifically planning student seating to meet individual needs throughout the periods of highest AET. For the students with ADHD in this study a more formal physical environment appeared to increase the likelihood of engagement in high demand tasks. This would

suggest that when attempting to teach students with ADHD basic academic skills of high demand a formal setting may be more effective.

This proposition is supported by the behaviour of most target students on higher demand tasks in less structured settings. Kyle was consistently unable to remain on task in informal situations. He functioned more effectively with the close direction of his teacher in a more structured setting. The greater informality of the composite classroom in which Ricky operated, particularly under Cheryl's direction, did not facilitate time on task. Mitchell, also, was unable to direct his own behaviour sufficiently to benefit from the more informal and autonomous setting that his teacher provided for her students.

In Eric's classroom the learning environment was consistently rated as moderate in its formality and Eric was rated as having the highest average AET. In this case a highly structured setting was clearly not necessary but the consistent level of moderate structure appeared to be important. The level of desired formality in the physical environment is not a specific recommendation of the effective teaching literature but this research suggests that at least a moderate level of formality in the physical environment is desirable for the successful completion of high-demand tasks for students with ADHD.

From an analysis of the data relating to classroom organisation the following factors emerged as significant in promoting high levels of TOT and AET:

- moderate levels of formality in the setting; and
- planned seating of the target student away from distractions and close to on-task peers.

13.5 RESPONSE TO RESEARCH QUESTION 5

What classroom management strategies lead to increased time on task and academic engaged time for students with ADHD?

Certain management procedures did emerge as being of importance to increased TOT and AET in this research. The *monitoring behaviour of the teachers* was moderate to high on eighteen of the nineteen occasions when students were academically engaged 70% of the time or more (see Appendix H, column 14). Low monitoring behaviour, therefore, did not facilitate engagement for students with ADHD in this study. With all students but Eric some teacher redirection back to task was also noted during these periods of high time on task. This suggested that monitoring of behaviour was essential to detect off-task behaviour before it became prolonged or disruptive and assisted the students in returning to task. High levels of monitoring was one of the most commonly recommended practices for students with ADHD (Bender & Mathes, 1995; Goldstein, 1995; Purvis, Jones, & Authement, 1992; Schwean et al., 1993; Yehle & Wambold, 1998), and has been strongly supported by this research.

Teachers *directly approached and individually assisted* students on most occasions of high time on task when those tasks involved moderate or high demand. This could be related to the high level of monitoring. Because the teacher was monitoring, evidence of off-task behaviour or task difficulties could be noted and addressed quickly. The opportunity to interact with their teachers appeared to facilitate academic engaged time for students with ADHD. This suggests that teachers need to be available as a resource for their students during seatwork rather than remaining at their desks involved in preparation or marking of other work.

Initially one anomaly appeared to emerge from the data. Although Cheryl monitored to a high degree, this did not translate into high percentages of academic engaged time for Ricky. Other factors appeared to have an effect. Cheryl engaged in many teacher redirects unlike most of the other teachers when the students were academically

engaged. This suggests that her monitoring behaviour was not effective. Closer analysis revealed that her monitoring episodes were regularly interrupted and on many occasions were not followed up with complete closure of the interaction. Thus, movement toward Ricky with a direction to return to task was not followed up by ensuring that this in fact occurred. The teacher was often distracted by other classroom interactions and moved off before Ricky returned to task. High monitoring levels alone were not sufficient.

The use of *moderately to highly explicit language* was also noted during every period of on-task behaviour when this was relevant. This seemed to be a major characteristic of the teachers who were more successful in keeping the students with ADHD on task. There was a range of instances when the effects of less explicit language were noted. Directions needed to be highly explicit for this group of students. Clear and direct language in combination with high monitoring levels appeared to be a very effective combination. The critical importance of the use of direct language is not made explicit in the recommendations for students with ADHD, although some recommendations imply this. For example, highly structured teaching and explicit task setting suggests the use of very direct language, but this research suggests that greater emphasis needs to be placed on the importance of how teachers use language in all aspects of their interactions with students, whether in delivering instructions, redirecting students or explaining procedures.

A pattern of *moderate to strong routines* consistently accompanied on-task behaviour. While routines assisted students with ADHD to remain engaged in lesser demand tasks, they appeared to be even more important when students were involved in higher demand academic tasks. This appears to be of particular importance for students who do not have their own well developed organisational skills, such as students with a diagnosis of ADHD. Routines were widely used in Hilary's and Ed's classrooms, those with the highest average AET and TOT. Hilary consciously spent time

introducing and reinforcing routines in her classes despite the fact that she only had twelve weeks with each Intensive Reading group. Routines were considered to be a critical part of ensuring that the best possible use was made of the limited time available.

This finding was consistent with the fact that there were few routines in place in Mitchell's classroom and there were much lower averages of TOT and AET. This supports the literature relating to the importance of routines to high levels of academic engaged time (Dunlap et al., 1982; Englert, 1984; Gettinger, 1986; McDonnell, 1996; Pisarchick, 1989; Wheldall & Carter, 1996) and to academic achievement (Anderson, Evertson, & Brophy, 1979; Brophy, 1979; Emmer & Evertson, 1981; Evertson, Anderson, Anderson, & Brophy, 1980). The use of routines is also a consistent recommendation for teaching students with ADHD (Bailey & Rice, 1997; Barkley, 1990; Bender & Mathes, 1995; Goldstein, 1995; Prior, 1996).

The notion that students with ADHD, even very young ones, can be taught useful strategies which will help them remain on task has also been supported by this research. Kyle's teacher's success in teaching him self-cueing strategies to direct himself toward the office supports the view that even very young students with a diagnosis of ADHD are capable of learning self-management strategies. Eric's successful use of organisational cues at home also points out the viability of such cues.

From an analysis of the data relating to management practices, the following factors emerged as being of importance to high levels of TOT and AET:

- high monitoring behaviour;
- use of explicit language; and
- use of routines.

13.6 RESPONSE TO RESEARCH QUESTION 6

What instructional strategies are most effective in facilitating academic engaged time for students with ADHD?

Strong and consistent themes emerged in relation to the instructional behaviour of teachers when high levels of AET were recorded. The lessons of higher AET incorporated *structured demonstrations* on at least 13 of the 14 occasions when this was relevant (see Appendix H, column 19). On lower demand tasks demonstrations were not consistently present. In fact on many of those occasions, such as when students were engaged in self-selected activity, the use of demonstrations was irrelevant. It was apparent, however, that *once the demand of the task increased*, highly structured demonstrations became very important.

Both Hilary and Ed regularly used detailed and structured demonstrations. This is also consistent with the effective teaching literature which reports that step by step, explicit demonstrations greatly increase the likelihood of academically engaged behaviour (Askew, 1993; Christenson et al., 1987; Dunlap et al., 1982; Frudden & Healy, 1986; Gettinger, 1986).

Structured task setting was also in evidence on all occasions of high percentages of AET (excluding Mitchell's single instance of high AET when engaged in silent reading where such task setting was not relevant). This was a feature of the general instructional language that was used in the classrooms of those teachers who were most successful in maintaining the academic engagement of their students. In some instances students maintained high levels of on-task behaviour with very low levels of task setting but these periods were generally of low-demand tasks and often student-selected, thus more easily attended to than more demanding tasks. This aspect of instructional practice also featured in the effective teaching literature (Bradley,

Bjorlykke, Mann, Homon, & Lindsay, 1993; Ellis et al., 1994; Englert, 1984; Rosenshine & Stevens, 1986; Valett, 1989; Yates, 1988).

Moderate to high levels of momentum were recorded during 71 of the 74 periods of high time on task. When students were academically engaged in tasks of moderate to high demand, momentum was also almost always rated as high. Students with ADHD maintained greater on-task behaviour and academic engagement when classroom activity proceeded without interruption. Even on low-demand tasks a sense of purposeful, continuous activity was evident in these classrooms when on-task behaviour was high. Momentum appeared to be a critical element of those classrooms where time on task and academic engaged time of students with ADHD were highest. The inclination of students with ADHD to be distracted and to move off-task appears less likely to be realised if there is a sense of purposeful activity in the classroom. It seems likely that momentum is even more important for this group of students than for regular students who have less difficulty maintaining attention.

Strong teacher direction of those tasks which were considered to be more demanding facilitated this sense of momentum, as did *direct involvement of the student in interactions with the teacher*. Momentum and active responding by students are strongly recommended in the effective teaching literature (Brophy, 1979; Englert, 1984; Frudden & Healy, 1986; Rosenshine & Stevens, 1986). Both have been supported by this research.

Specific feedback was not always relevant when the students were engaged in, for example, free choice activities. Therefore, this element of the classroom was not a distinct feature of high time on task. During periods of high AET, however, *frequent feedback of a specific nature* was observed on all relevant occasions. A number of researchers have found that specific elaborated feedback facilitates academic

achievement (Crocker, 1986; Englert, 1984; Frudden & Healy, 1986; Fuller, Miller, & Lesh, 1989).

The use of visual aids, including use of the chalkboard or whiteboard, appeared to assist the on-task behaviour of the students with ADHD. This suggests that greater use of such materials in support of classroom instruction may meet the needs of students with ADHD. Analysis of the lessons which promoted high levels of AET revealed that there was a high visual component in them. Some of the most effective teachers in this study were "visual" in their approach. They were animated, gave dynamic demonstrations, and moved around the classroom when teaching. The greater use of visual aids is a recommendation of some writers in the field of ADHD (Barkley, 1991; Barkley, 1992; Goldstein, 1995; Purvis et al., 1992; Schwean et al., 1993; Yehle & Wambold, 1998), although it is not a widespread recommendation.

From an analysis of the data, the following instructional strategies emerged as being of significance to high percentages of TOT and AET:

- sequenced demonstrations;
- structured task setting;
- direct teacher assistance;
- maintenance of momentum;
- frequent feedback;
- use of process feedback; and
- use of visual aids and cues.

13.7 RESPONSE TO RESEARCH QUESTION 7

How does the affective climate of the classroom contribute to the learning environment for students with ADHD?

There were positive personal interactions observed between teacher and target student during more than 50% of the periods of high time on task and academic engaged time

indicating an overall positive relationship between the teachers and their students. This was confirmed in interviews with students, teachers and parents. All teachers spoke of the target students with warmth and affection even when acknowledging the frustration and disruption that so often surrounded them. All parents spoke highly of the teachers in terms of their relationships with the children. This suggests that a positive relationship between student and teacher facilitates academic engaged time and supports the view of writers like Glasser (1993) and Rogers (1995) who consider that a positive relationship is productive in the teaching situation. The more neutral stance recommended by Soar and Soar (1979) has not been supported by this research.

What is also suggested by this research is the fact that a warm and positive relationship *alone* is not sufficient to teach these students effectively. All teachers, without exception, had positive relationships with the target students. There were great differences, however, in the average periods of time on task with each student. Mitchell's teacher was particularly mindful of developing a nurturing and positive relationship with her students, but time on task in her classroom was very low.

From the data relating to the affective climate of the learning environment the following factor emerged as being associated with high percentages of TOT and AET:

- a positive relationship between student and teacher.

13.8 RESPONSE TO RESEARCH QUESTION 8

What combination of factors provides the most appropriate learning environment for students with ADHD?

In order to address the final research question, a synthesis table (Table 13.1) was drawn up which listed those classroom elements which were consistently present during periods of high engagement, as discussed in this chapter. These elements related to many different aspects of the classroom system: to individual student behaviour; to the level of peer interaction; to task factors; to organisation of the physical

environment; to classroom management factors; to teacher instructional factors; and to the affective tone of the classroom. The wide range of factors which emerged from the data supports the view that it is an *interaction of elements* which contributes to the overall functioning of a system.

Once the classroom elements were identified, each classroom environment was given an *overall rating* of whether that element was usually present based on summarised information as presented in the Results chapters.

Table 13.1 reveals that those classroom environments that scored the highest average AET did, in fact, have the greatest number of effective teaching elements. Those classrooms that scored the lowest average AET percentages had the fewest number of the above elements. There was not, however, a direct relationship between the average AET percentages and the number of important elements of an effective classroom environment across all classroom environments.

For example, Table 13.1, column 4 reveals that 14 of the 17 elements were usually present in Kyle's classroom, yet Kyle's average AET was only 29%. This suggests that the elements missing from that environment – low manifestation of ADHD behaviours, an academic focus, and maintenance of momentum – are perhaps more important than some other elements. The absence of these particular factors appeared to be associated with loss of instructional time, despite the fact that Kyle's teacher incorporated many of the recommended practices for increased academic engaged time and academic achievement.

Another inconsistency arises from the fact that, although the learning environments of both Ricky (when with Hilary – see column 8), and Eric (see column 9) contained all the elements identified in this research as being associated with high levels of AET, average percentages of TOT and AET for Eric were somewhat higher than for Ricky.

This suggests that either *greater amounts* of the important elements were present in Eric's classroom or there existed within that environment *other factors,* which have not been identified at all, which would explain the difference.

It is apparent, therefore, that it was not possible to determine from this research the *precise* nature of the interactions between these elements of the classroom ecology. A three point scale for the measurement of some classroom elements clearly has its limitations and finer measurements may result in more clearly delineated relationships. Nevertheless, the factors identified in this research clearly combine to play some part in the development of a classroom system which meets the needs of students with ADHD, because they were consistently associated with high levels of engagement for this group.

Table 13.1
Factors Consistently Present During Periods of High Academic Engaged Time in Relation to their Usual Presence within Target Students' Classrooms

1 Classroom factor	2 Mitch-ell's cl'room	3 Ricky with Cheryl	4 Kyle's cl'room	5 James' cl'room	6 Ricky with Jacqui	7 Ricky with Rose	8 Ricky with Hilary	9 Eric's cl'room
1. low manifestation of ADHD behaviours				✓	✓	✓	✓	✓
2. academic focus		✓			✓	✓	✓	✓
3. student/task match		✓	✓	✓	✓	✓	✓	✓
4. low interaction with peers			✓	✓		✓	✓	✓
5. moderate formality of setting			✓	✓		✓	✓	✓
6. planned seating			✓	✓		✓	✓	✓
7. effective monitoring procedures			✓	✓	✓	✓	✓	✓
8. use of explicit language			✓	✓	✓	✓	✓	✓
9. use of routines			✓	✓		✓	✓	✓
10. use of visual cues/materials			✓	✓	✓	✓	✓	✓
11. sequenced demonstrations			✓	✓	✓	✓	✓	✓
12. structured task setting			✓	✓	✓	✓	✓	✓
13. direct teacher assistance	✓	✓	✓	✓	✓	✓	✓	✓
14. maintenance of momentum				✓	✓		✓	✓
15. frequent feedback		✓	✓	✓	✓		✓	✓
16. use of process feedback			✓	✓	✓		✓	✓
17. positive relationships with students	✓	✓	✓	✓	✓	✓	✓	✓
Average AET of target student	**11%**	**13%**	**29%**	**42%**	**43%**	**46%**	**68%**	**78%**

It is Eric's classroom experience which provides the most compelling evidence of the fact that it is not individual factors alone that "cause" a student to have difficulty in staying on task or maintaining engagement, but rather the *interaction of elements within the classroom environment.* As a student diagnosed with ADHD, Eric would have been expected to demonstrate many difficulties in his classroom. In fact, Eric was almost always on task and was one of the highest achievers in the class. There appeared to be factors within his classroom environment that suppressed the ADHD behaviours and enhanced his learning opportunities.

It is possible that Eric's level of ADHD is somewhat milder than some of the other target students in this study. It could also be that the determining factor was the twelve week period he spent in the Intensive Reading class in Year 4. His Year 5 experience, however, had not been as successful (parent interview, 30/10/96, see Chapter 12.1.4), so it would seem reasonable to suggest that some elements at least of his Year 6 experience were responsible for his enthusiasm for, and success at, school.

How a range of factors interacted to provide the most effective learning environment for a student with ADHD and the possible role of factors outside the immediate environment of the classroom may be explained to some extent by returning to Bronfenbrenner's (1979) ecological model of development. This will be the focus of the final chapter. Because Eric scored such consistently high ratings for time on task and academic engaged time, his story will be used to explain how elements of different systems interacted to form a highly productive learning environment for a student who, according to the literature reviewed in this thesis, had a significant predisposition to problems in the classroom context.

13.9 CHAPTER SUMMARY

In this chapter, the research questions posed in Chapter One have been addressed through a discussion of summarised findings. Patterns which emerged across the case studies have been identified. Those factors which emerged from the data as being important in promoting high levels of time on task and academic engaged time, and therefore learning, have been presented. Eric's classroom has been put forward as the environment in which those factors came together in the most productive way. In the next chapter, a model of effective teaching for students with ADHD which emerged from this study is presented using the two innermost layers of Bronfenbrenner's ecological model. Recommendations which emerged from this study are also presented.

CHAPTER FOURTEEN

RECOMMENDATIONS: TOWARD AN EFFECTIVE MODEL OF TEACHING STUDENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

The purpose of this study was to investigate the classroom environments of primary school aged students with a diagnosis of ADHD in order to develop a model of effective teaching practice for them. There was a particular emphasis on determining the nature of an environment which would enable these students to remain engaged in high demand activities: activities that would contribute to academic success for them. While many promising practices and recommendations have emerged from psychological laboratories and the effective teaching research, there has been little classroom-based investigation or "testing" of these recommendations. This study aimed to redress this balance, using Urie Bronfenbrenner's (1979) ecological model as a theoretical framework, in order to challenge, confirm or extend the recommendations.

This final chapter presents the major conclusions which emerged from the study in the form of a model of effective teaching for students with ADHD. The conclusions are discussed within the framework of Bronfenbrenner's (1979) ecological model of human development. This chapter also discusses some implications for teaching practice, teacher education and further research .

14.1 AN ECOLOGICAL MODEL OF EFFECTIVE TEACHING FOR STUDENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

Figure 14.1 represents a model of effective teaching for students with ADHD which has emerged from the data collected in this study. It has taken into account, in Bronfenbrenner's (1979) terms, only the microsystems of the classroom, school and

home and their interactions within the mesosystem. No two-dimensional model, however, can accurately portray the nature of the inter-relationships within such a complex system as a classroom. It seems useful, nevertheless, to adapt Berk's (1991) diagrammatic representation of Bronfenbrenner's (1979) ecological model as presented in Chapter Two to incorporate the findings from this study. It serves as a framework for the explanation that follows.

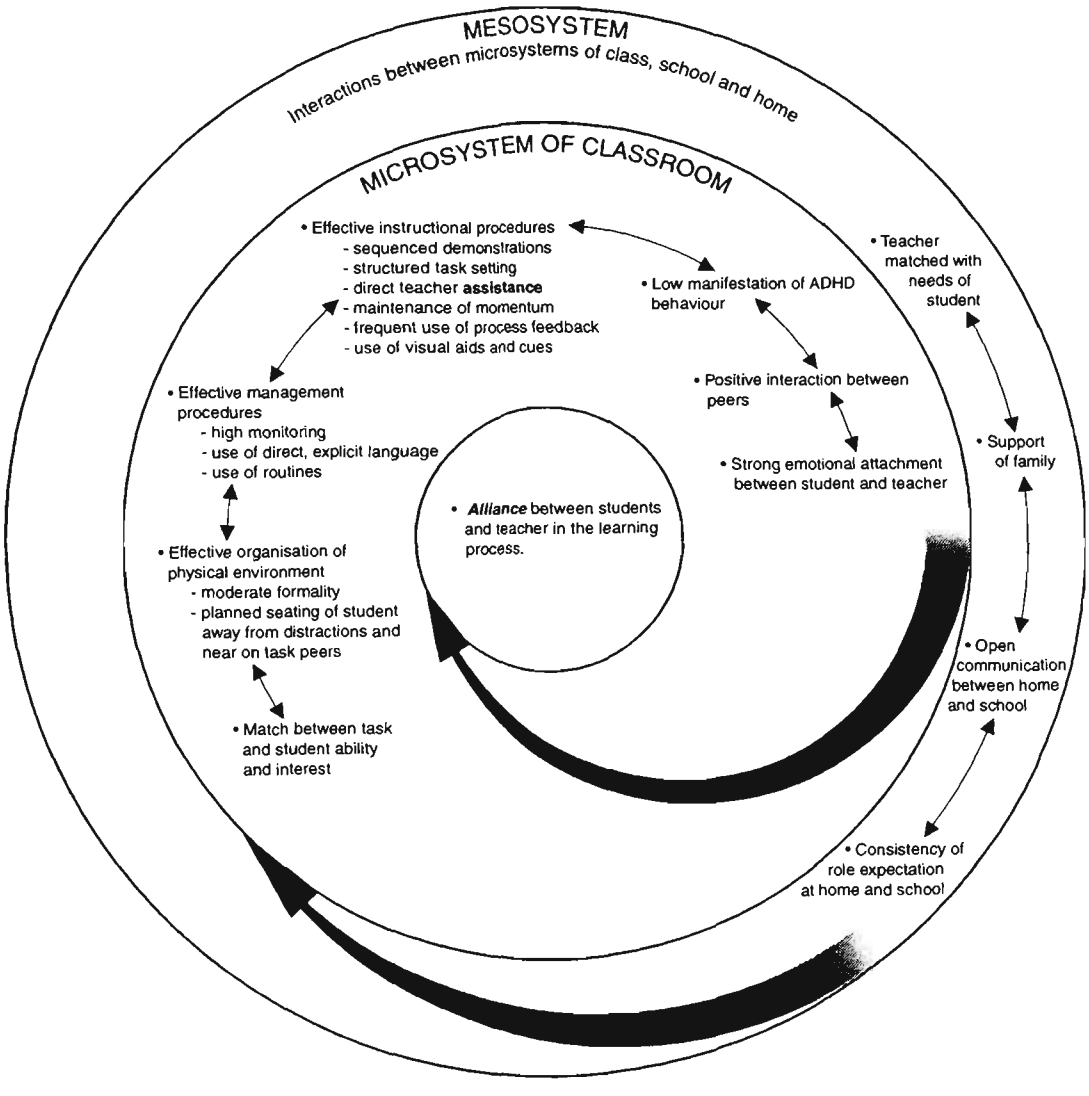

Figure 14.1 A Model of Effective Teaching for Students with ADHD

As stated in Chapter Thirteen, Eric's experience will be used with reference to the diagram to explain how elements of different systems interacted to create a learning environment which matched his individual needs and resulted in optimal educational

outcomes for a student who, according to the literature, was greatly at risk of learning and behavioural problems. The classroom environments of other target students in this study incorporated *some* features of an optimal learning environment, but it was Eric's classroom which appeared to encapsulate those features that maximised the educational opportunities of students diagnosed with ADHD.

14.1.1 The Mesosystem

Beginning at the outer layer, the mesosystem, the model reveals the importance of *matching the teacher with the needs of students.* At the level of school organisation the placement of Eric's teacher, Ed, with the composite Year 5/6 class began the chain of interactions which have been examined in this thesis. Ed was chosen as the class teacher because the principal had become aware of how successful Ed had been as a casual teacher at the school the previous year. The principal particularly noted how Ed related to some of the more challenging senior boys in the school. Thus Ed's placement on the difficult Year 5/6 class was made with a sense of "matching" the teacher with student needs.

Family support, the next element highlighted within the mesosystem, also interacted with other elements to promote Eric's development. Bronfenbrenner's (1979) eighth Hypothesis refers to the way in which the capacity of a dyad to function effectively depends on the nature of relationships with third parties. Thus, the success of the student-teacher relationship within the microsystem of the classroom is enhanced by the extent to which third parties such as parents are supportive of the developmental activities carried on within the teacher-student relationship. The developmental dyad of Eric and his teacher was strengthened by supportive links with Eric's family and by the consistency of the approach used at home and at school. Goal consensus between the different microsystems and compatible role demands provided a sense of congruence for a student who needed this in order to maximise his developmental potential. This

congruence was seen by Bronfenbrenner to be even more important for individuals who were perceived to be at some disadvantage within a system such as students with ADHD would be. Thus, the strength of the interrelationships between home and school provided support for Eric's development at the mesosystemic level.

It was evident that there was *open communication* between Eric's home and school environments, the next element identified within the mesosystem. Eric's family felt comfortable about contacting the school, confident that his needs were being met, reassured by Eric's positive experiences at school in the important year before secondary school, and able to support and consolidate classroom practices. Eric's success in the classroom was enhanced by the practical support he received from his family. There were several instances recorded of the assistance offered by Eric's family in helping with homework and in providing a structured home environment. The positive interactions and *high level of consistency* between the microsystems of Eric's classroom and his home served to promote his time on task and academic engaged time, and therefore his learning.

14.1.2 The Microsystem

On entering the next layer, the microsystem of the immediate classroom environment, clusters of elements emerged as being of importance to an effective learning environment. A *close match of set tasks or learning activities with the ability level and interest of the student* was evident in Eric's classroom. Ed was aware of Eric's ability level. He was aware of the ability levels of all his students. This was one of the reasons for the success of his many quizzes: he was able to direct questions to certain students and ensure success.

Maintaining the interest level of the students was also partly the result of Ed knowing a great deal about his students: where they came from, their background experiences,

what they were interested in, and so on. His use of nicknames for many of the students and his ability to personalise a great deal of routine classroom activity appeared to greatly increase the motivation factor in his classroom. This ensured that more of the learning activities within the classroom became *molar* activities which facilitated greater levels of engagement and rates of completion. In some other classrooms in this study, few of the learning tasks would have been classified as molar activities and this appeared to have the effect of limiting student engagement.

Factors relating to the *effective organisation of the physical environment* form the next cluster of elements within the microsystem of Eric's classroom which promoted both his engagement and learning. For most activity within this classroom, moderate levels of formality in the classroom setting contributed to persistent engagement in high demand tasks; the optimal situation when trying to teach core educational material. Eric was placed close to on-task peers, particularly early in the year when this was required to help him maintain attention. This may be contrasted with the informality and freedom of movement in Mitchell's classroom which did not appear to provide sufficient structure for such a highly distractible student. Kyle also found it difficult to maintain engagement in more informal settings and responded more appropriately when in a more highly structured setting.

The use of particular *management procedures* within Eric's classroom system was also associated with high levels of engagement. Close monitoring of seatwork, the use of direct and explicit language when issuing instructions and redirecting behaviour, and the use of routines for regular classroom procedures were consistently associated with high levels of time on task and academic engagement. Ricky also maintained high percentages of academic engaged time under these conditions in Hilary's classroom, with lower percentages scored when this combination of management strategies were not apparent.

The specific *instructional procedures* used in Eric's classroom also appeared to contribute to his successful classroom experiences. Demonstrations and instructions were always highly explicit. Ed moved to the students to assist them rather than waiting for them to come to him. These factors assisted the maintenance of momentum in the classroom. There was smooth transition from one task to the next, high rates of successful task completion and, when there were inevitable interruptions to classroom procedures, direction back to task was quickly achieved.

This high level of focused activity which was present because students knew what to do, were motivated to do it, and were able to do it, contributed to *low manifestation of ADHD behaviours* in Eric and *positive interactions among peers*. All members of the classroom system essentially interacted in a productive and harmonious manner. This contributed to an overall positive affective tone within the classroom, but something more profound also appeared to be present in Eric's classroom.

As mentioned in Chapter Four, the importance of the personal dimension in effective teaching is a matter of some debate. It does not feature in the effective teaching literature, which concentrates almost exclusively on management and instructional procedures. The importance of relationship building has been a feature of the behaviour management literature for several decades (see for example Ginott, 1971; Glasser, 1993; Rogers, 1995) but behaviour management and effective teaching appear to have been considered, at least from a research point of view, as two quite separate entities rather than as closely related elements of an effective learning environment. Research into effective learning environments appears to have been conducted in a fragmented rather than an integrated manner, with little research effort directed toward an understanding of the interaction of management and instructional strategies with that much more intangible factor: interpersonal relationships. This study suggests that it may well be the *interpersonal bond* between teacher and student that acts as a catalyst in

transforming a mediocre environment into one which generates the highest quality teaching and learning.

The importance of the student/teacher bond and the overall positive emotional climate of the classroom emerged strongly in both observational and interview data in this research and appeared to be a critical element of the ecology of Eric's highly effective classroom. The diagram in this chapter cannot accurately portray the pervasive influence that the strongly positive affective tone in the classroom appeared to have. The personal relationship Eric's teacher developed and maintained with his students and the contribution this made to what was a highly effective learning environment is consistent with Bronfenbrenner's seventh hypothesis:

> Learning and development are facilitated by the participation of the developing person in progressively more complex patterns of reciprocal activity with someone with whom that person has developed a strong and enduring emotional attachment and when the balance of power gradually shifts in favour of the developing person. (p. 60)

A *strong emotional attachment* between Eric and his teacher, in fact between the teacher and all his students, was a feature of this classroom. Of all the dyads examined in this study, it was Eric and his teacher who formed the most effective developmental dyad. They shared "a strong and enduring emotional attachment" as specified in the above hypothesis. Eric was conscious of the fact that his teacher liked him and the rest of the class. *"We've never had a teacher that liked us so much - well, not all of us"*, as reported in Chapter 12, was a telling comment. The range of motivating learning activities developed by Ed and his use of personal references throughout all his teaching conveyed to his students the fact that they were important to him. This strong interpersonal bond may be even more important for students who have difficulty focusing their attention and in maintaining engagement until task completion. The very

existence of such a strong bond could be seen as a factor which assisted Eric in directing his attention to the required task. The desire to engage with his teacher was translated into a desire to engage with tasks as directed by the teacher. Eric's emotional bond with Ed created the additional motivation required to overcome his tendency to become distracted and so move off task. Students with an attention deficit may need greater attention-focusing mechanisms. The motivation engendered by the interpersonal bond with the teacher could operate as a significant attention-focusing mechanism.

The fact that the most productive learning environment requires *both* effective teaching strategies (incorporating the organisational, management and instructional components confirmed in this thesis) *and* a strong interpersonal bond is highlighted by the other case studies. Kyle's teacher developed warm relations with him and used most of the strategies recommended by the effective teaching research but the constant interruptions led to a loss of momentum which in turn reduced academic engagement. James and his teacher interacted positively, but the lack of academic focus in his classroom meant that he was mostly occupied in tasks of low demand rather than in core learning experiences. The warm, nurturing and caring environment provided by Mitchell's teacher was not sufficient on its own because it was not accompanied by the necessary structure that effective teaching strategies provide. Ricky shared mutually positive feelings with each of his four teachers, but critical elements of effective teaching were missing with three of them which had the effect of reducing his academic engagement. Hilary combined both a warm relationship with Ricky and the full range of effective teaching strategies and the result was a high level of engagement. The fact that Ricky's average level of academic engaged time was not as high as that of Eric suggests that Eric's classroom environment had some additional element. Eric and his teacher shared more than simply a warm relationship – it was a "strong and enduring" bond. When the strength of that relationship interacted with the full range of effective teaching strategies, an optimal learning environment was created.

Bronfenbrenner's seventh hypothesis also refers to a shifting of power in favour of the developing person as important in facilitating learning and development. The fact that the power was moving toward the students, even in such a strongly teacher-directed classroom, was evident in the fact that by the second stage of data collection Ed did not need to be in the classroom for Eric to remain engaged in his work. He had taken that responsibility upon himself: the power to remain on task had been shifted to him.

A strong emotional attachment between the two members, shared and meaningful activity, and a power shift towards the developing person are all characteristics of a developmental dyad which Bronfenbrenner (1979) proposed as being the most effective in enhancing individual development. These notions match almost exactly those referred to in the concept of *alliance* as discussed earlier in this thesis and highlighted in the centre of the model in Figure 14.1. Alliance requires a bond between the professional and the "client"; it requires a shared understanding of the goals toward which the developing person is moving and of how those goals will be reached; and it requires the ability on the part of the developing person to perform the tasks in pursuit of those goals.

Eric and his teacher had formed a strong alliance, a function of the strong interpersonal bond between them in conjunction with shared understandings of where they were going and how they were going to get there. The tasks set to achieve those goals were seen by Eric to be relevant, meaningful and attainable. The structuring of the learning environment and the provision of personally meaningful learning activities facilitated the most positive educational outcome for Eric. His predisposition to difficulties in the classroom context as a result of his diagnosis of ADHD was successfully overcome by the interactions of a range of classroom elements in combination with the organisational support of the wider school, the practical and emotional support of his family, and the bond he shared with his teacher.

Alliance incorporates all the components of a successful student/teacher partnership: strong and reciprocal feelings of high regard; agreed upon goals; and the establishment of an environment which facilitates the achievement of those goals. Students with ADHD appear to respond best when each of these elements is present. The effective teaching strategies provide the appropriate support to counteract their predisposition to learning and behavioural problems and the strong interpersonal bond provides the added motivation to help them direct their attention and maintain their engagement. The combination of factors is perhaps even more important for them than for students who do not experience such difficulties in regular classrooms.

One must be cautious when making recommendations which arise from a study based on a small number of individual cases. Nonetheless, the use of case studies does allow for in-depth analysis and case to case generalisation. This study has supported the effective teaching literature and broadly confirmed the recommendations commonly made for increasing successful educational outcomes of students with ADHD. Indicators also emerge from this study that certain classroom elements are more important than others in their potential impact on the academic engagement of students with ADHD. The challenge now is to ensure that information concerning the most appropriate classroom environment for students with ADHD permeates classrooms and teacher education institutions. Recommendations for teaching practice, for teacher education and for further research into improving the educational outcomes for students with ADHD will now be presented.

14.2 RECOMMENDATIONS FOR TEACHING PRACTICE

This study has confirmed the importance of certain organisational, management and instructional strategies which promote the learning of students diagnosed with ADHD. It has also highlighted the fact that optimal conditions exist when those effective strategies co-exist with strong mutually positive feelings between students and teacher,

forming an alliance which promotes engagement and learning. Below, suggested practices for enhancing the time on task and academic engaged time of students with ADHD are described.

Recommendation 1 The affective component of the learning environment needs to be consciously planned for, resourced and implemented.

Considering the importance of this element of the learning environment, particularly for students who are at some disadvantage within the system, it deserves a greater emphasis in the broader curriculum. The development of a strong bond with their students should be a major goal of teachers: one which is considered to be equally important as other major educational goals.

Recommendation 2 Curriculum tasks need to be appropriate in terms of interest and ability levels for students with ADHD.

While this should be axiomatic, it seems that not enough attention is focused on this element of effective teaching in some classrooms. Student/task match as outlined in this thesis is a complex notion that requires many skills on the part of the teacher and emerged as a critical component of success for students with ADHD in this research.

Recommendation 3 Students with ADHD are best placed near on-task peers in order that peers provide effective role models for them.

Most students in this study benefited from specific placement away from distractions and near on-task peers, particularly when engaged in higher demand tasks. Peers may have an important role to play in facilitating the on-task behaviour of students with ADHD.

Recommendation 4 Specific training in group participation skills is recommended for students with ADHD.

Students with ADHD do not develop the skills required for successful group work as easily as most other students. These skills may need to be specifically taught if students

with ADHD are to benefit from this form of teaching. This may require quite different, or at least modified, group skill instruction programs.

Recommendation 5 A learning environment of at least moderate formality is recommended in order to promote engagement in high demand tasks.

When teaching new core skills and processes, at least moderate levels of formality appear to facilitate this instruction. Limiting student movement around the classroom, placing students with ADHD near on-task peers and ensuring that seating arrangements facilitate eye contact between all students and the teacher are recommended to reduce the chance of distraction and increase the chance of task engagement and completion.

Recommendation 6 High levels of monitoring behaviour combined with the use of explicit directions and instructions are recommended to increase engagement time.

Monitoring alone is not enough. Ensuring that the student has returned to the task, has the necessary resources and is capable of doing the task are important co-requisites if monitoring is to be effective.

Recommendation 7 Directly approaching students rather than waiting for them to request assistance is recommended to facilitate task engagement.

Teachers who are proactive in determining whether or not students are on task and successfully achieving the goals of lessons will facilitate the learning of their students. Waiting for students to identify problems was not associated with time on task in this study.

Recommendation 8 The implementation of routines for regular classroom procedures, including transition times, is recommended to increase levels of AET.

A large part of the differences in time on task between individual students in this study appeared to be a function of the teacher's ability to implement specific procedures for

many of the routine events which occur throughout a school day. The implementation of routines would appear to be an important part of increasing time on task and therefore potential learning.

Recommendation 9 Carefully sequenced demonstrations with highly structured task setting is recommended to increase the likelihood that students with ADHD will understand the learning tasks and remain engaged in them over time.

The use of demonstrations was a key feature of those lessons which maximised academic engaged time in this study. This was particularly so for tasks of higher demand. Demonstrations should also be as interactive as possible. This increases the likelihood that students with ADHD will attend to and engage in the learning activity.

Recommendation 10 Maintaining lesson momentum is strongly recommended.

High levels of interaction between students and teacher, a relatively rapid pace of instruction and the use of direct and explicit instruction assist the maintenance of momentum and increase the engagement of students who have a predisposition to become distracted and move off task.

Recommendation 11 Frequent feedback which is directly related to the academic task at hand is recommended to facilitate engagement in learning tasks.

Elaborated feedback rather than more generalised feedback was found in this research to be associated with students' engagement in academic tasks. This strategy also provides further opportunity to reinforce important concepts rather than simply acknowledge that a student is on task.

Recommendation 12 Increasing the use of relevant visual aids in lessons is recommended.

Increasing visual input and reducing the amount of auditory input alone is recommended as students in this study appear to respond to visual stimuli and a visual style of teaching.

Recommendation 13 The provision of legitimate opportunities for motor activity for students with ADHD may reduce inappropriate movement and facilitate engagement in tasks.

If students are permitted to subvocalise, swing legs or make small rhythmic movements (assuming these actions do not interfere with the learning of other students) there may be fewer more intrusive manifestations of ADHD-type behaviours. Strategies of this nature often appeared to assist students with ADHD in remaining on task in this study.

Recommendation 14 Actively teaching self-cueing strategies may assist students in maintaining attention to a specified task.

Even students of Kindergarten age responded to self-cueing strategies which had been specifically taught to them. While this may require the assistance of a Teacher's Aide or Support Teacher in the implementation of a self-monitoring or self-cueing program, this study revealed that useful strategies can be taught by a classroom teacher within the regular class program.

14.3 RECOMMENDATIONS FOR TEACHER EDUCATION

Recommendation 1 Teacher education programs should incorporate a greater emphasis on the development of interpersonal relationships as a critical component of effective teaching.

Many teacher education programs are discipline driven and so tend to be presented as a series of component parts. Developing expertise in the key learning areas is clearly important but there should be greater acknowledgement of the importance of a positive affective climate of a classroom and ways in which this may be promoted. This requires more than foundation units in psychology and sociology. Bronfenbrenner's

notion of a "curriculum for caring"(1979, p. 53), which he proposed 20 years ago, is worthy of consideration.

Recommendation 2 Teachers would benefit from more information, preferably at the preservice level, regarding the teaching practices that are associated with increased academic engaged time and academic achievement.

These findings have been available for close to two decades but appear not to have permeated some teacher preparation courses. Teacher preparation programs need to incorporate a greater emphasis on the critical component of effective teaching strategies. This could be well placed within a "curriculum for caring" as this research has demonstrated that the combination of strong relationship building and effective teaching strategies results in a highly productive teaching/learning environment.

Recommendation 3 Behaviour management should become a mandatory component of all preservice programs.

This research has supported the view that when students are on task to a high degree there is less conflict and disruption in classrooms. Behaviour management was identified as an area of great need in the Ministerial Advisory Council on the Quality of Teaching Report on Teacher Preparation for Student Management (1998). This study supports the effective teaching literature (as reviewed in Chapter Four) which suggests that certain classroom practices can greatly reduce the occurrence of some behaviour management difficulties. There is also evidence that training in classroom management can increase the amount of AET in classrooms (Fitzpatrick & McGreal, 1983). Thus, specific training in the area of behaviour management should help reduce the occurrence of problems which have a significant impact on the learning of many students. Once again, this would be well placed within an integrated subject on the development of a positive learning environment which also addressed the establishment of teacher/student relationships and effective teaching strategies.

14.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Recommendation 1 Investigation of those characteristics of classrooms and teachers which promote creative and insightful learning in addition to learning associated with academic gains for students with ADHD.

As stated in Chapter Four, learning encompasses much more than academic gains. There is some evidence that individuals with ADHD, precisely because of their impulsive cognitive style, may be predisposed towards highly tangential and creative thinking. Determining ways in which these potential gifts may be nurtured in regular classrooms is worthy of further research.

Recommendation 2 Investigation of training programs for students with ADHD in co-operative learning and group task skills.

Many students find the skills required for successful group work challenging but such skills appear to be even more difficult for students with ADHD to acquire. Research into specific programs which may be successful in developing these skills in students with ADHD may be a fruitful avenue of research.

Recommendation 3 Investigation of the precise nature of the relationships between elements of the classroom ecology and increased academic engaged time.

This research has highlighted many features of a successful classroom learning environment for students with ADHD. The findings suggest, however, that some features may be more significant than others. Task match, lesson momentum and the use of explicit language appear to be particularly important in maintaining academic engaged time and therefore increasing learning opportunities. Further research into these particular aspects of the classroom ecology may increase understanding of the role they play in facilitating learning for students with ADHD.

Recommendation 4 Investigation of the role of visual aids with students with ADHD.

The precise role that visual aids and materials may play in maintaining the attention of highly distractible students is worthy of further research. There were some indications

in this research that this factor could be highly significant. Precisely how visual aids and cues may facilitate learning is still under investigation. The work of Chandler (1991; 1992), Levin (1981) and Levin, Anglin & Carney (1987) suggests that not all visual material is uniformly helpful in facilitating understanding. Some visual aids cause a split attention effect which can detract from learning because extraneous or disparate information may cause the learner to split his or her attention before the information becomes intelligible. Are visual aids only useful in serving an immediate stimulation purpose, attracting and maintaining the attention of students with a predisposition to distractibility? Further investigation of how visual aids may reinforce learning, assist with the organisation or clarification of concepts, or assist the recall of information may be fruitful with this group if they do, in fact, respond more readily to visual stimulation.

Recommendation 5 Development of peer training programs.

There is evidence that peer training programs can increase the effectiveness of the support they provide for students (Kotkin, 1995; Martella et al., 1995). This study found that students were not of great assistance in helping their ADHD peers. Research into the most effective forms of training for peers may result in useful guidelines for improved peer support for students with ADHD.

Recommendation 6 Investigation of the role of self-talk in maintaining attention to task for students with ADHD

The role that language plays in assisting students with ADHD to maintain engagement in a task is worthy of further research. Such investigation may extend existing research in the area of self-talk with students who experience learning difficulties. Specific instruction in self-monitoring and self-guiding talk with this group of students could have significant implications for their improved performance in classrooms and increase the effectiveness of cognitive-behavioural programs which currently exist.

14. 5 FINAL REFLECTION

This research has contributed to an understanding of the interactions of students with ADHD and different elements of the classroom ecology in two important ways. Firstly, it has confirmed that much of the effective teaching literature applies to primary school aged students with ADHD. While many of the recommendations for teaching students with ADHD emanated from the effective teaching literature, there has been a dearth of research which tested these recommendations in the natural learning environment of students with this diagnosis. Further, this research suggests that certain of the recommended practices are more important than others in contributing towards the most advantageous learning environment for these students, with the maintenance of momentum and an academic focus appearing to be particularly important.

A second important outcome of this research is that it provides significant support for the notion that effective teaching for students with ADHD is more than a collection of management and instructional procedures. While this is not a new assertion, there has been little classroom-based evidence of the importance of the affective climate to an effective learning environment for students with this diagnosis. It appears that students with an identified attention deficit may benefit from the additional motivation that accompanies a strong student/teacher alliance. This may be a critical element in helping diagnosed students focus attention in the required direction: they are motivated by their strong desire to align themselves with their teacher. When the strong interpersonal bond is combined with the management and teaching strategies identified in the effective teaching literature and confirmed by this study, a highly productive learning environment is established: one that maximises the learning of students who are deemed to be considerably at risk of learning and behavioural problems.

Despite these contributions, upon reflection it is also clear that this research could have been enhanced in a number of ways. Greater consideration of Bronfenbrenner's outer

circles, including a more comprehensive analysis of the interaction of additional microsystems such as neighbourhood settings would have added considerable depth to this study.

Measures of academic engaged time, while convenient, are also a very limited measure of learning. Greater analysis of what the students in this study actually learned would have added to this research. Of particular interest would have been interviews with the students themselves to explore their perspectives on what they learned and, more generally, how they believe they learn most effectively.

The impact of teacher beliefs on classroom practice was also worthy of further follow-up. The power of personal beliefs about learning in directing classroom management and instruction appeared to be of considerable importance in this study. While this aspect of the research could have been an entire study on its own, there is some sense that this was not explored to its potential within this research.

Students with ADHD can contribute to a disruptive and dysfunctional classroom learning environment. This is a common experience for many students with this diagnosis, for their peers and for their teachers. This study has revealed, however, that it is possible for them to have enjoyable and productive experiences in regular classrooms. While a successful outcome for these students is a function of many different elements within their classroom and broader environments, factors under the control and direction of teachers can contribute in large part to a successful learning environment for them. A major goal for teachers should be the establishment of a personal bond or alliance with their students which actively promotes their learning, maximises their educational experiences and ultimately enhances the quality of their lives.

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APPENDIX A

BRONFENBRENNER'S HYPOTHESES USED IN THESIS BUT NOT SUPPLIED IN FULL WITHIN TEXT

Appendix A1

Hypothesis 1

The development of the person is a function of the substantive variety and structural complexity of the molar activities engaged in by others who become part of the person's psychological field either by involving her in joint participation or by attracting her attention.

Appendix A2

Hypothesis 2

Once two people begin to pay attention to one another's activities, they are more likely to become jointly engaged in those activities. Hence observational dyads tend to become transformed into joint activity dyads.

Appendix A3

Hypothesis 3

Once two persons participate in a joint activity, they are likely to develop more differentiated and enduring feelings toward one another. Hence joint activity dyads tend to become transformed into primary dyads.

Appendix A4

Hypothesis 4

The developmental impact of a dyad increases as a direct function of the level of reciprocity, mutuality of positive feeling, and a gradual shift of balance of power in favor of the developing person.

Appendix A5

Hypothesis 5

Observational learning is facilitated when the observer and the person being observed regard themselves as doing something together. Thus the developmental impact of an observational dyad tends to be greater when it takes place in the context of a joint activity dyad (a child is more likely to learn from watching a parent cook a meal when the activity is structured so that the two are acting together).

Appendix A6

Hypothesis 6

The developmental impact of both observational learning and joint activity will be enhanced if either takes place in the context of a primary dyad characterized by mutuality of positive feeling (one learns more from a teacher with whom one has a close relationship). Conversely mutual antagonism occurring in the context of a primary dyad is especially disruptive of joint activity and interferes with observational learning.

Appendix A7

Hypothesis 28

The developmental potential of settings in a mesosystem is enhanced if the role demands in the different settings are compatible and if the roles, activities, and dyads in which the developing person engages encourage the development of mutual trust, a positive orientation, goal consensus between settings, and an evolving balance of power in favor of the developing person.

Appendix A8

Hypothesis 34

The developmental potential of settings in a mesosystem is enhanced if the roles, activities, and dyads in which the linking person engages in the two settings encourage the growth of mutual trust, positive orientation, goal consensus between settings and an evolving balance of power responsive to action in behalf of the developing person. A supplementary link that meets these conditions is referred to as a *supportive link.*

Appendix A9

Hypothesis 35

The developmental potential of a setting is increased as a function of the number of supportive links existing between that setting and other settings (such as home and family). Thus the least favorable condition for development is one in which supplementary links are either nonsupportive or completely absent - when the mesosystem is weakly linked.

Appendix A10

Hypothesis 36

The developmental potential of a setting is enhanced when the supportive links consist of others with whom the developing person has developed a primary dyad (the child's father visits the day care center) and who engages in joint activity and primary dyads with members of the new setting (the child's mother and teacher are bridge partners).

Appendix A11

Hypothesis 39

The developmental potential of participation in multiple settings will vary directly with the ease and extent of twoway communication between those settings. Of key importance in this regard is the inclusion of the family in the communications network (for example, the child's development in both family and school is facilitated by the existence of open channels of communication in both directions).

Appendix A12

Hypothesis 40

The developmental potential of settings is enhanced to the extent that the mode of communication between them is personal (thus in descending order: face-to-face, personal letter or note, phone, business letter, announcement).

Appendix A13

Hypothesis 41

Development is enhanced to the extent that, prior to each entry into a new setting (for instance, enrolling in day care or school, being promoted, going to camp, taking a job, moving, or retiring), the person and members of both settings involved are provided with information, advice, and experience relevant to the impending transition.

Appendix A14

Hypothesis 42

Upon entering a new setting, the person's development is enhanced to the extent that valid information, advice, and experience relevant to one setting are made available, on a continuing basis, to the other.

APPENDIX B

FIELD NOTE SAMPLES

Sample of Stage 1 Field Notes

Date/time: Friday, 22 March, 1996; 2.00 - 3.00
Setting: KH classroom; craft (paper curling, rolling and pasting to create animal mural for back wall); two Year 6 students assisting
Teacher: Julie (regular teacher)
Target student: Kyle
Additional Comments: Very hot and humid

Julie started out by demonstrating the activity at the front with the children seated on the floor in front of her, rolling several pieces of paper and pasting them onto a large outline of a duck. She then designated certain students to particular tables where parts of the mural were spread out on desks. She gives very clear directions.

Kyle attended quite well throughout the demonstration, although he was playing with a drawing pin prior to the demonstration until Julie noticed and took it from him.

I assisted a number of the students including Kyle once they started. Kyle did not have the patience to roll the paper into tiny balls, but rather wanted to paste large pieces of paper to cover the area quickly. Kyle's enthusiastic approach combined with the fragility of the paper and his relatively poor (when compared to the other students) fine motor skills meant that his efforts at paper curling also looked somewhat worse for wear. Kyle's contribution was a fairly ragged looking part of a pond! There is a wide range of skill level and task persistence in the class if today's results are any guide.

I was not aware of how Kyle was going for a large part of the time as I assisted many of the other students, but he was not redirected too many times by Julie. He moved around between tables a great deal to look at other parts of the mural but did not interfere with anyone that I noticed. The Year 6 girls do not tend to help him – I asked them later if they help him much and one replied that "It's better to leave him to Mrs H..... – she can handle him better than us".

There was a thunderstorm towards the end of the afternoon which caused a bit of a commotion. Kyle overreacted somewhat. He wasn't frightened but he ran from one side of the room to the other to watch the rain hit the asphalt, make patterns on the

window, calling out to various people to come and look at the trees moving, etc in a very loud voice.

I was very conscious of the way Julie speaks to the Kinder students. She speaks very naturally to them – there is no sense of the over-articulation, etc that often characterises Kindergarten teachers' mode of speech in my experience. She also makes quite a lot of little jokes with them, and even when she reprimands or redirects Kyle, she always ends up by smiling at him and he always grins back. They seem to have already established a warm relationship.

Kyle seems to like his special place marked by a large masking tape cross in the right hand front corner of the seating square marked out on the carpet at the front of the room. Julie mentioned later that if any other student sits there, Kyle really objects. This seems to be a useful cue for him.

The children take little notice of me even though this is only my second visit to their classroom. I think the number of parent visitors in the classroom, Year 6 helpers, etc means that the students are quite used to having other people in the room with them.

Sample of raw field notes

28/8/96

Combined language activities with KD in ICD room

St: J.
T: ML – KL

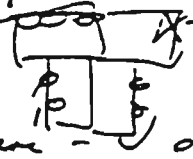
1.30 M digs to get chi's attention. J waving head around. M explains lang activities – language master; story writing; Bingo game; puzzles. J starting round room throughout instruction

·34 M tells red group to move, then green, blue, purple.

·35. J follows peer next to him to Language Master. Puts earphones on. J is squashed against wall. Bigger boy next to him keeps bumping him as peer adjusts earphones. J doesn't complain. J mouths words – is very squashed against wall ✓✓✓✓✓✓✓✓✓✓✓

·39 J Closes book. "I done mine" to no-one in particular. Takes headphones off. Waits – looking around ✓✓✓ Moves away from wall & sits on floor (away from larger peer? uncomfortable?) ✓✓

ICD ·41 T gaps & directs them to move on. J follows larger peer to group of tables for story writing. Walks around table (female) – J sits away from others



·42 Peer calls 'J sit here' – J doesn't respond. J starts to draw picture (?) ✓✓✓ ✓✓✓ ✓✓✓✓ ✓✓✓ ✓✓✓

·45 T gaps down J to write name ✓✓. J then dictates story to T – 'I had a aeroplane birthday cake'. T starts to write under picture. J gazes around. T says, 'What's birthday start with? What's cake start with?' J correct both times ✓ T smiles sometimes – J gazes, playing with teeth. T directs J to copy words.

·48 J starts to copy ✓ Stops. Jumps around a chair-fact moving. Copies ✓✓✓ up to bit. Puts teeth

back. Looks at drawing done by other child near pencil box. Puts it in front of him. Starts to colour that picture. Changes colour frequently

'51 T opps. Doesn't notice writing not complete. Looks at picture. 'Is that an aeroplane?' Joshua (inaudible) T directs him back to writing 'You've got up to + - finish it now.' J starts writing repeats + - then rolls up paper he's writing on. Looks through roll at me. Smiles. Continues to look around classroom through rolled paper

'54 Flattens paper out. Takes away letter from pocket. Returns to drawing. colours - plays with texture. T opps + marks writing. T reads then J reads the sentence. T says, 'Where's birthday cake?' 'Finish N please!' J starts to write while T watches ✓✓✓ J lifts head T says, 'Nearly finished!' J writes

'57 T directs class to start packing up. J keeps writing. Finishes... T takes paper... J stands (class gathering at front)

'59 T at front J wandering around. Comes room to mat area briefly - returns - sits at back of group

2.00. T doing clapping pattern (transition activity) J gazes - doesn't clap T directs all class back to KL room. J goes to his desk, plays with paper scrap.

2.02 J looks up. - everyone at front on mat. He goes + sits front to side. Saying counting. T - 'I'm thinking of a word...' J gazing. Some put hands up. J does (? aware of Q!) T - 'Who's had a birthday this year?' (J doesn't raise hand but should) J blows hair of girl in front. Boy enters room with message. J looks while he talks to T then starts swaying,

rocking. T gives message re examination - remember re notes. J continues to work head around.

2.05. Observation concludes.

Sample of prepared field notes

Date/time: Tuesday, 6 August, 1996

Setting: Composite classroom; Year 3 cohort on floor at front waiting for maths lesson as Cheryl concludes Year 2 maths lesson

Teacher: Cheryl

Target student: Ricky

Additional Comments:

TOT	AET	Time	Observations Notes	Observer comments
		10.56	Ricky gazing around, playing with watch, kneels up and looks around; sets off alarm on watch. Teacher says, "Are you ready Ricky?" Ricky waves arms around.	• Distracted, hyperactive behaviour • No follow up to direction by teacher
		10.59	Cheryl began introduction to maths lesson. Asked boy to try one on board. Ricky began swaying, called out to boy chosen to do fractions on board; Ricky said, "That looks like a /w/"	• Impulsivity
		11.01	Ricky talking to boy next to him; playing with watch. Teacher reprimands Ross who is the centre of attention for a few seconds. Ricky watches interchange between Ross and teacher.	• distracted • Ross and Ricky in one class a difficult combination. Check policy on placement of students
		11.02	Teacher explaining task. Ricky whistling. Teacher said, 'Stop that Ricky. Ricky whistled on an off, shook head.	• No follow up of redirection
		11.04	Teacher sent Year 3 back to seats. Ricky jumped on boy behind and they rolled around on floor; went back to seat via circuit of the room. Opened book; started work; talking but on task " One out of five; this is easy; one out of nine; this is easy" ✓✓✓✓	• Impulsive behaviour • Friendly wrestle; teacher doesn't notice
2 min	2 min		✓✓✓✓✓✓✓✓✓	

TOT	AET		Observation Notes	Observer comments
		11.06	Ricky runs out to front; teacher sends him back; Ricky sits up straight with arms folded and calls out, "We're all finished".	
		11.07	Ricky turns page in book and starts tracing over drawing. Peer at table says, "We did it wrong" Ricky starts looking around desk, says, "Gotta get a pen. Please get a pen. Where's the pen". Keeps talking as he looks through bag and under desk. Gets pen from under desk; Walks to front; joins line. Ricky talks to boy near him in line; sits on floor; starts drawing on textbook; calls out to teacher, "I've got my pen".	• Selftalk directing activity? • Impulsivity
		11.10	Teacher asks Ricky to sit at front. Ricky moves there on bottom; continues to wriggle when he arrives at front, bouncing around on his bottom. Teacher calls out answers. Ryan marks book ✓✓✓✓✓✓;	Later found Ricky had all incorrect; some had been marked correct
1 min	1 min			
		11.12	Ricky starts to doodle on book. Teacher calls him to "show me". Teacher says, "You didn't understand. Have another go now."	
		11.13	Ricky runs back to desk; takes girl's bag off desk on the way; she calls out "Hey". Teacher says, "Ricky". Ricky lightly throws pencil from table at another girl on way to desk. Teacher says, "Apologise, Ricky" Ricky says, "Sorry" as he keeps moving. Arrives at own desk. Leans across table, takes rubber and pencil. Peer calls out loudly, "Ricky!" Teacher says, "Ricky". Ricky throws it back; laughs, looks under table.	• No maliciousness, but Ricky constantly distracting and annoying other students. They appear remarkably tolerant

TOT	AET	Observation Notes	Observer Comment
	11.15	Gets diary from under desk.	• Maths lesson was over and they moved onto diary writing but not sure how maths lesson concluded. No follow-up of the fact that Ricky had done the exercise incorrectly and was meant to 'have another go'. Teacher spoke at length afterwards about how Ricky impacts on the class.

APPENDIX C

LETTER TO PAEDIATRICIANS

FACULTY OF EDUCATION
Northfields Ave
Wollongong, NSW. 2522
Australia
Tel: (02) 42 213 603
Fax: (02) 42 214 657
Email deslea_konza@uow.edu.au

Deslea Konza
Co-ordinator
Special Education Programs

8 January, 1997

Dr.....
.....
.....

Dear Dr .....

Re: ADHD research

Your name has been provided by the parents of one of your patients as being the doctor who diagnosed his ADHD. I am approaching you with the permission of those parents (see consent form attached).

I am currently undertaking a classroom-based study of primary school aged students with a diagnosis of ADHD with a view to determining the most effective classroom organisational, management and teaching strategies for them. This is being supervised by Dr Jessica Grainger, a clinical psychologist and senior lecturer at the University of Wollongong.

Because it is important for the reliability of the research, I am requesting information regarding the specific diagnosis and how the diagnosis was made. If you agree to do this, could you please tick any of the diagnostic procedures you used from the list attached and record the child's specific diagnosis.

I have enclosed a stamped addressed envelope for the return of the checklist. If you require any further information regarding this research, or would like follow-up on the results of the research, please contact me.

Thank you very much.
Yours sincerely

Deslea Konza

Procedures used in Diagnosis of Attention Deficit Hyperactivity Disorder

Family history taken

Medical history taken
- physical
- neurological

Developmental assessment
- intellectual/cognitive assessment
- language development

Behavioural assessment
- behavioural checklist issued to parents
- behavioural checklist issued to teacher
- behavioural checklist issued to child care worker

Instruments used
- Connors' ADHD/DSM-IV Scales (1978)
- Child Behaviour Checklist (Achenbach, 1991)
- DSM-IV Scales(1994)
- McCarney Scales (Hawthorn Educational Services, Colombia MO, 1993)
- Brown ADD Diagnostic Form (Harcourt, Brace & Co, 1996)
- Deveraux Scales of Mental Disorders (Harcourt, Brace & Co, 1996)
- Behaviour Assessment Schedule for Children (BASC) (American Guidance Service, 1992)

Any other procedures followed?.....

Specific diagnosis of student named below.....

Thank you very much.

I agree to Deslea Konza approaching my child's paediatrician ..... for information regarding **specific diagnosis and procedures used in the diagnosis of ADHD only.**

Parent name..... Child's name.....

Date.....

APPENDIX D

INTERVIEW SCHEDULES

Appendix D1

Interview Schedule for Teachers

Audiotaped/not audiotaped

1. How would you describe target student's general classroom behaviour?
2. What do you believe assists target student engage in a task?
3. When on task, what keeps target student engaged?

   Probe - curriculum match?
   - lesson content and/or demand?
   - particular classroom organisation?
   - particular management strategies?
   - particular instructional strategies?
   - school organisational factors?
   - structure of lesson?
4. When off task, what contributes to this behaviour?

   Probe - role of medication?
   - individual cognitive or behavioural characteristics?
   - classroom organisational variables?
   - peers?
   - management or teaching strategies?
5. Have you noticed any particular strategies that the student uses him/herself that seem to help him stay on task?

   Probe: - response to visual stimuli?
   - repetitive movements?
6. Have you tried to teach him/her any particular strategies to help him stay on task?

   Probe - what were they?
   - were they successful?
7. How would you rate target student's level of language compared to his/her peers?
8. How would you rate the support that target student gets from home?

   Probe - willingness to support?
   - ability to support?
9. How would you describe target student's relationships with his peers?
10. What do you believe are the most critical factors in the successful teaching of target student?

Appendix D2

Interview schedule for Principals

The following topics were addressed in semi-structured interviews with the principals of the two research sites.

Part A Description of the schools

- location
- physical description
- historical development
- student population
- neighbourhood
- special distinctions
- reputation
- well known graduates

Part B Staff

- teachers (level of experience, gender mix, teaching styles)
- support personnel

Part C Policy

- organisation of classes
- how students are placed in classes
- parent involvement in school
- role of parent choice in student placement
- administration of medication
- professional development
- curriculum development
- uniform
- role of individual programming
- role in community

Part D Student Population

- 'typical' students
- students with special needs
- ability range

Appendix D3

Interview Schedule for Parents

Audiotaped/not audiotaped

NB All interviewees are assured that they have the right to decline to answer any questions and to stop the interview at any time. All answers will be transcribed and shown to the interviewees for confirmation and/or correction. Any material may be deleted from the interview transcript at any time.

Part A Demographic information

Target student: DOB: Site: Class:

Parent occupation: Father: Mother:

Siblings:

Part B Early development

Pregnancy/birth complications?

Early developmental history/physical milestones

Part C Diagnosis/Medication

How old was target student when his behaviour first started worrying you?

What sort of behaviours were they/

Where did you go for help?

Who diagnosed ADHD? Permission to contact?

Is target student on medication? Dose? Medicated on weekends?

What are the effects of the medication? Side effects? Are side effects continuing?

Part D Beliefs about ADHD

What do you believe is the cause of ADHD?

Part E Family impact

What impact has this condition had on the family?

Do you do anything in particular at home that seems to help target student?

How does target student manage homework?

Does target student have friends in the neighbourhood?

Part F Progress at school

How does target student's teacher manage him in class?

How is target student managing at school?

How does target student get on with peers?

APPENDIX E

WORK SAMPLES

T. 22/10
1·30

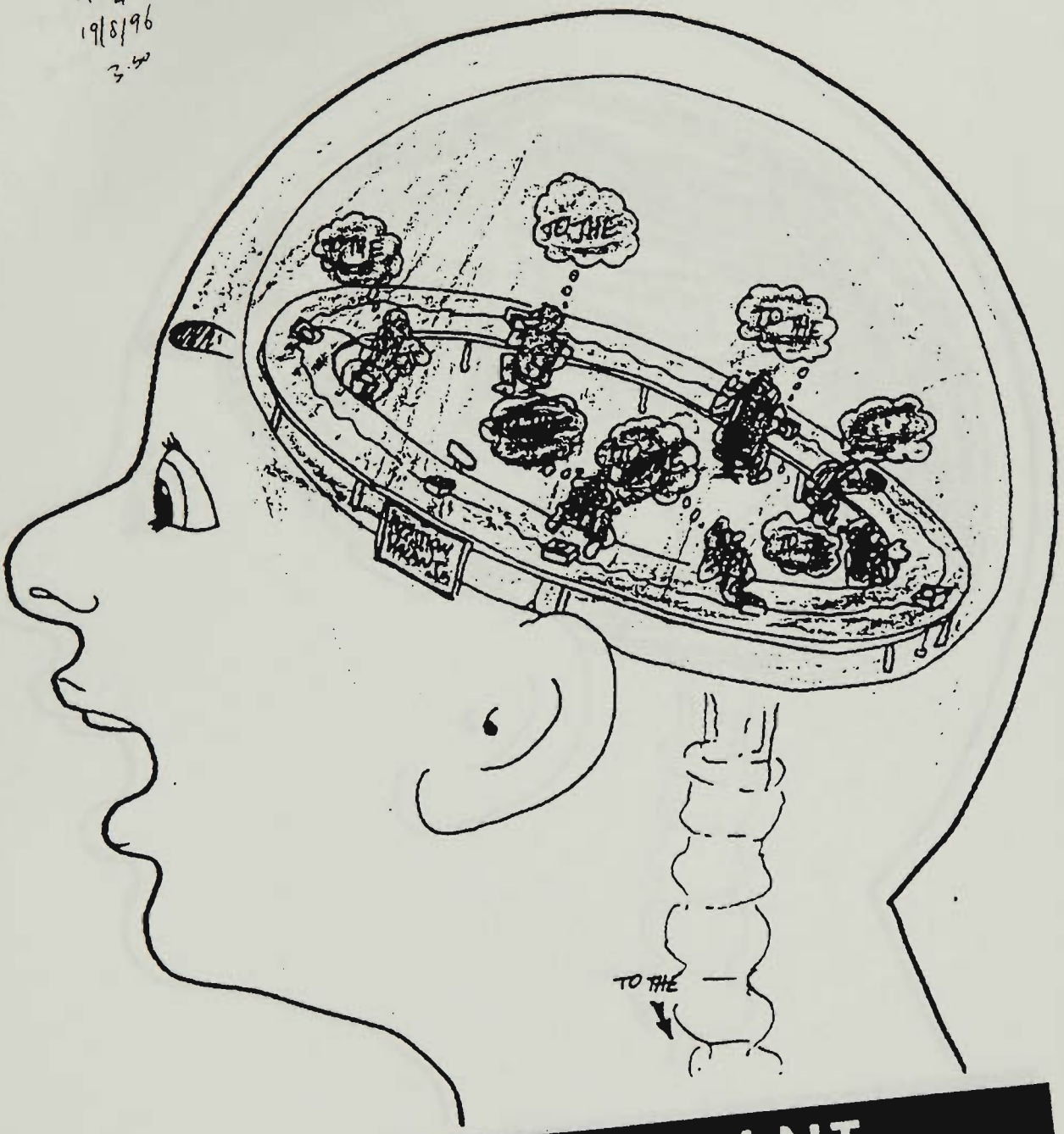
on the School holdages

The Three BILLy

How to make my lunch
Steep: get the bread out

Write an advertisement

M 4W
19/8/96
3.50

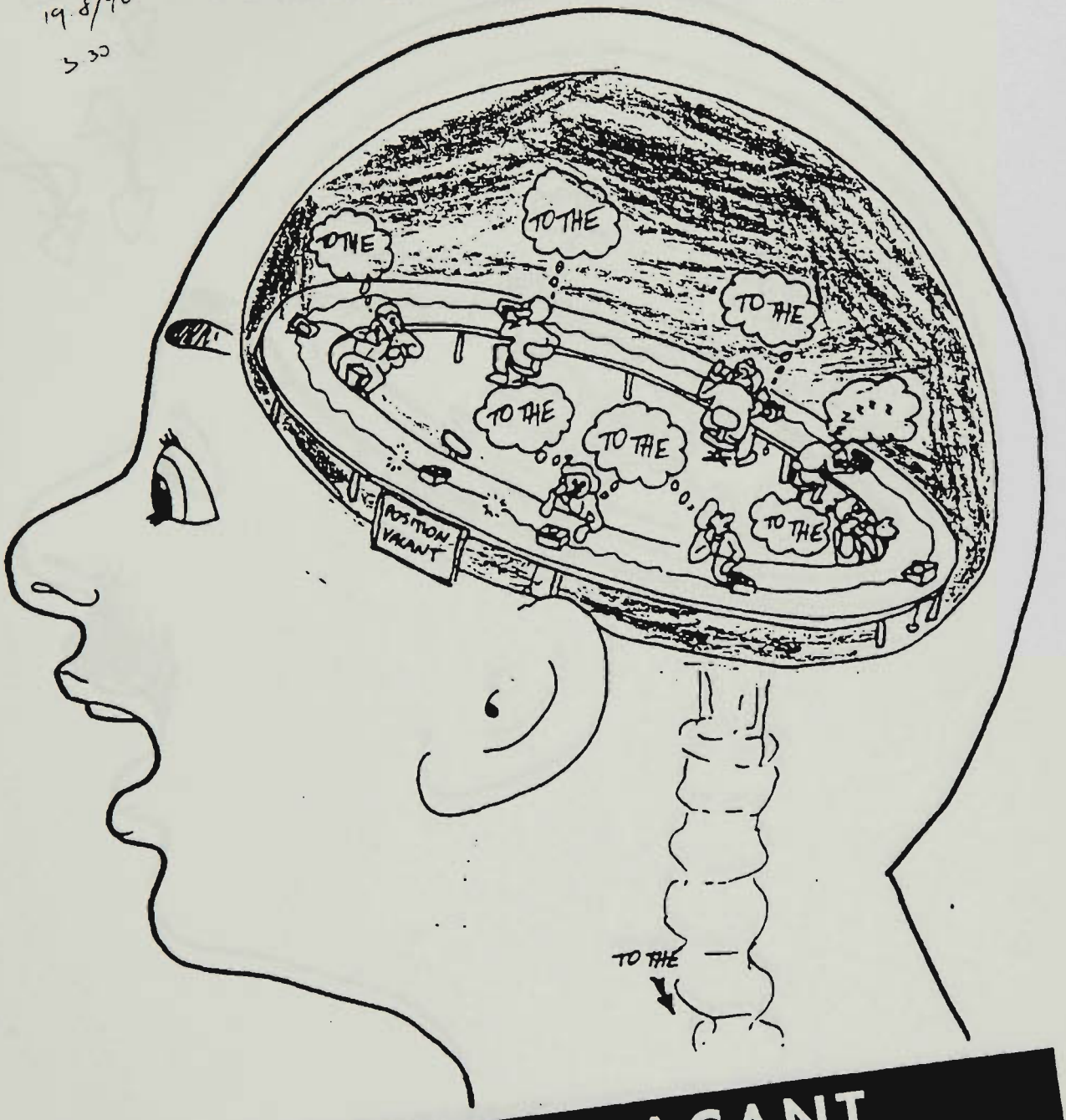


POSITION VACANT

Come to the Romance house, the heart you will be selling blood to Bram for a life time - you will get a free [illegible] from the [illegible] the [illegible] of [illegible]

Write an advertisement

G. AW
19.8/96
3.30



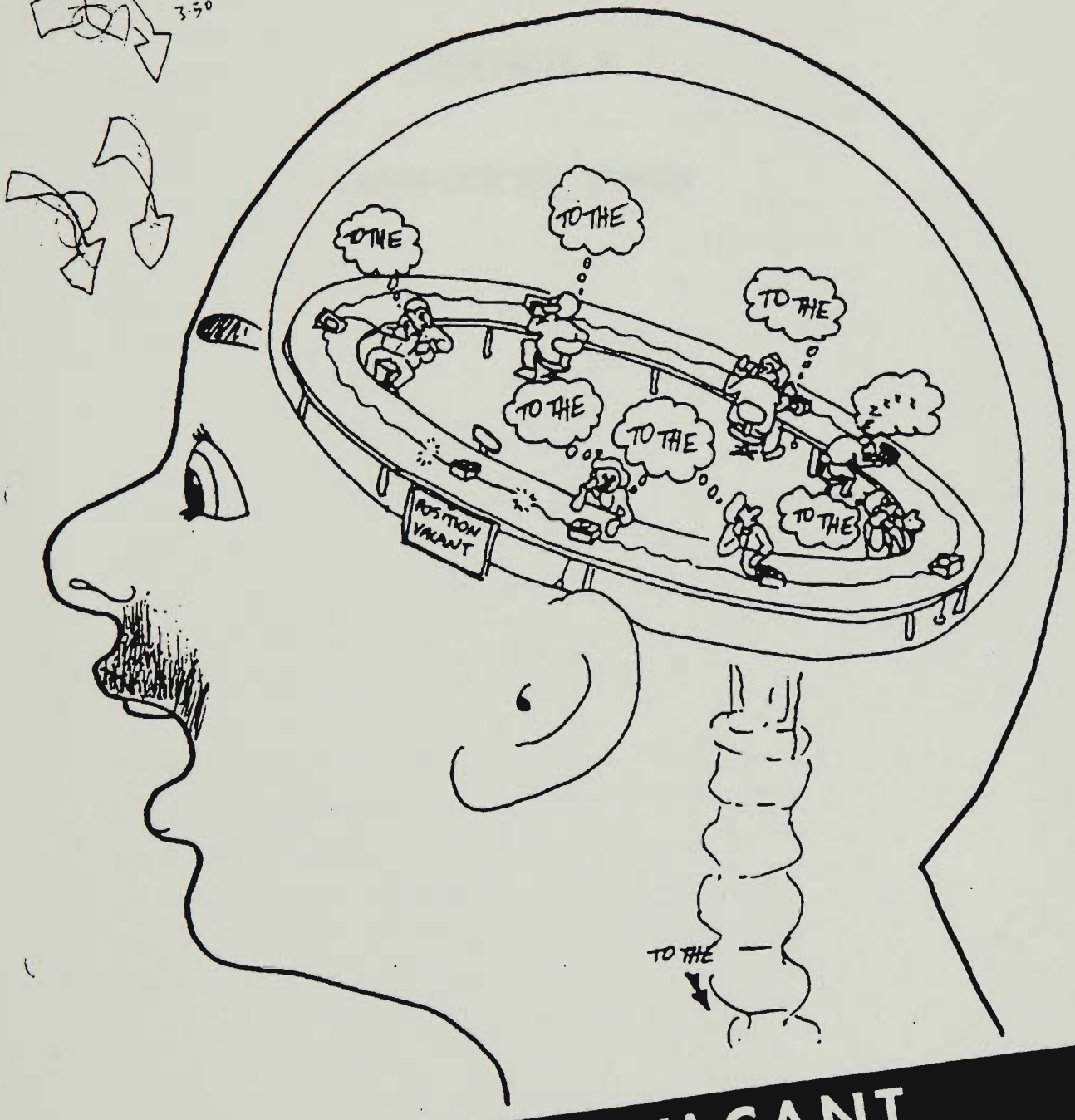
POSITION VACANT

Please come and help in ~~the~~ brains.
Only an hour each day Help body
~~X~~ needed getting 4-
48 Pay: 10.

9

Na 40
15/8/96
3.50

Write an advertisement



POSITION VACANT

Some One who is fast
Time ~~some~~ 5pm – 6am
to wiaiRC legs
Phone 96 436449
Pay 20. prains scili on hear

9

APPENDIX F

EXAMPLES OF MEMOS

Response To Visual Stimuli? Recorded after Observation 26

An illustrator was speaking to a combined audience from the junior school, including both Bailey and James. She was an extremely energetic performer and her role was to explain how an illustrator worked. She read through a story and went through the process of building up a picture on a whiteboard, explaining the strategies she used to add interest and humour. She regularly asked the students questions. James and Bailey remained attentive throughout this time. There were a few periods when she confined herself to speaking for several minutes, and even though she was a lively speaker, James stopped paying attention after approximately 15 seconds when the illustrator was simply talking. He was also unable to maintain attention when individual students were answering questions despite the fact that the illustrator was quite adept at interrupting a typical longwinded response.

When she had finished with the whiteboard, the illustrator moved to a different position where it was difficult for James to see. After being reprimanded several times for kneeling up in order to see, he sat back down and began playing with his shoelaces. He then appeared to lose interest in the session, removing his shoes and placing them on the wrong feet.

Response To Visual Stimuli? Recorded after Observation 33

The Junior school was assembled in the hall for a Christmas pantomime. James was seated three rows back towards one side and was watching closely when I entered. The pantomime had two actors playing six different parts, and there was a great deal of movement and colour, many changes of costume and quite a deal of singing. James did not participate in the singing, but participated to some extent when the audience was encouraged to shout warnings, etc as different characters appeared. James was quite tentative about this and only joined in after everyone else had.

At one stage, when one of the characters was talking on the telephone for a couple of minutes, and was not moving around, James yawned and stretched, but this was the only sign of inattention throughout the next 40 minutes. James seemed to be captivated by the performance. The colour, movement and activity suited him and he was able to maintain attention for the full 40 minutes of the show.

Response To Visual Stimuli? Recorded after Observation 30

The Kindergarten classes were combined for sports activities. Equipment such as quoits, long tunnel, tin stilts, bean bags, hoops, balance beam and mini tramp were set up around the quadrangle. This sport routine had been the same all year and the children were familiar with it. They started in their groups but gradually were able to move around as they wished.

On different occasions, James watched a boy trying to balance two beanbags on his head and tried to do the same, but with no success. He then stood for about a minute watching a girl using a skipping rope very efficiently, picked one up and tried to do the same, but with no success. He watched while one student jumped on the mini-tramp with his hands in the air and then did exactly the same thing.

APPENDIX G

TIME ON TASK SUMMARY TABLES

APPENDIX G

TIME ON TASK SUMMARY TABLES

Relationship between Periods of Time on Task Greater than 70% and Kindergarten Target Students, Peer, Classroom and Teacher Variables

Student Name and Observation Number	Task Factors				Target Student Factors					Peer Factor	Physical environment Factors		Teacher Managing Factors					Teacher Instructional Factors					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Kyle	Task Match	Task Demand	ATT	IMP	HYP	AT	IIP	IP	ImP	NP	FS	PS	MB	TR	DL	PI	R	Dem	TS	TAA	MM	FF	PF
Ob 17	high	high	mod	low	low	1	0	0	5	0	high	high	high	0	high	1	high	high	high	1	high	med	n/a
Ob 22	high	med	mod	mod	mod	1	0	0	1	0	mod	high	high	1	high	0	high	high	high	0	high	mod	mod
Ob 26	high	low	low	low	low	0	0	0	0	0	mod	high	high	1	high	0	high	high	mod	0	high	mod	low
James																							
Ob 4	high	low	low	low	low	0	3	0	3	2	low	low	mod	0	low	0	high	n/a	low	0	mod	mod	low
Ob 7	high	low	low	low	low	1	6	0	0	6	mod/ low	low	mod	1	mod	0	high	n/a	low	1	mod	mod	low
Ob 8	high	low	mod	mod	mod	0	2	0	0	3	mod	mod	mod	0	mod	0	high	high	mod	0	mod	mod	mod
Ob 12	high	high	high	mod	mod	0	3	0	1	1	low	low	high	2	mod	0	mod	mod	mod	3	mod	?	?
Ob 17	high	low	low	low	low	0	0	0	0	0	mod	low	high	0	high	0	mod	n/a	mod	1	mod	high	mod
Ob 18	high	med	low	low	low	3	0	0	2	3	mod	mod	high	1	high	1	mod	n/a	mod	1	mod	high	mod
Ob 20	high	low	low	low	low	1	1	0	0	0	low	low	mod	1	n/a	0	mod	n/a	low	0	?	?	?
Ob 21	high	low	low	low	low	1	0	0	2	0	mod	mod	high	0	high	2	mod	high	mod	1	mod	mod	mod
Ob 22	high	low	low	low	low	0	0	0	1	0	mod	low	mod	2	high	1	mod	high	high	2	mod	mod	high
Ob 24	high	med	low	low	low	1	0	0	2	0	mod	mod	high	0	high	1	mod	n/a	mod	1 ext	mod	high	high
Ob 25	high	high	low	low	low	2	1	0	2	2	mod	mod	high	2	high	1	mod	high	mod	2	mod	high	high
Ob 27	high	med	low	mod	low	2	1	3	0	2	mod	mod	high	1	high	2	mod	low	mod	1	mod	high	high
Ob 29	high	low	low	low	low	0	0	0	1	0	mod	low	mod	0	high	0	mod	n/a	mod	0	high	n/a	n/a
Ob 30	high	med	mod	low	low	0	0	0	2	0	mod	low	mod	0	low	0	mod	low	mod	1	mod	low	low
Ob 31	high	med	low	low	low	0	1	0	0	1	mod	low	high	0	mod	1	mod	n/a	mod	0	mod	mod	mod
Ob 32	high	low	mod	low	low	0	1	0	0	1	low	low	mod	0	mod	0	mod	n/a	low	0	low	low	low
Ob 33	high	low	low	low	low	0	0	0	1	0	mod	low	low	0	varied	0	n/a	n/a	mod	0	n/a	n/a	n/a
Ob 37	high	med	low	low	low	1	0	0	no	2	mod	mod	high	1	high	1	mod	mod	mod	1	mod	high	high

Key

ATT	attention problems	IP	interfered with/ignored peer	MB	monitoring behaviour	Dem	teacher demonstration
IMP	impulsivity evident	ImP	imitated peer	TR	teacher redirection	TS	structured task setting
HYP	hyperactivity evident	NP	received negative from peer	DL	direct language	TAA	teacher approached/assisted
AT	approached teacher	FS	formality of setting	PI	positive interactions	MM	maintenance of momentum
IIP	initiated positive interaction with peer	PS	planned seating	R	use of routines	FF	frequency of feedback
						PF	process feedback

Relationship between Periods of Time on Task greater than 70% and Target Students (Years 3 and 4), Peer, Classroom and Teacher Variables

Student Name and Observation Number	Task match	Task de-mand	Target Student Factors							Peer Fact-ors	Physical environ-ment Factors		Teacher Managing Factors					Teacher Instructional Factors					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Ricky			ATT	IMP	HYP	AT	IIP	IP	ImP	NP	FS	PS	MB	TR	DL	PI	R	Dem	TS	TAA	MM	FF	PF
Ob 10 (J)	high	high	mod	high	low	3	1	0	0	0	low	low	high	4	high	2	mod	high	high	3	high	high	high
Ob 12 (J)	high	low	mod	low	low	0	1	0	0	0	low	low	mod	1	mod	0	low	mod	mod	1	mod	low	low
Ob 14 (J)	med	low	mod	mod	mod	1	1	0	0	0	low	low	low	0	low	1	mod	low	low	0	high	low	low
Ob 15 (J)	med	low	low	low	low	0	1	0	0	0	low	low	mod	1	mod	0	mod	low	mod	1	high	mod	low
Ob 17 (H)	high	med	low	mod	low	4	1	0	0	0	high	high	high	2	high	0	high	high	high	3	high	high	high
Ob 18 (H)	n/a	low	low	low	low	0	n/a	0	n/a	0	low	high	n/a	?	?	?	n/a	n/a	n/a	?	?	?	?
Ob 19 (H)	high	high	low	low	low	2	0	0	0	0	high	high	high	1	high	3	high	high	high	2	high	high	high
Ob 20 (H)	high	high	low	low	low	2	2	0	0	0	high	high	high	2	high	1	high	high	high	5	high	high	high
Ob 21 (H)	high	high	mod	low	low	3	2	2	0	0	low	low	low	0	high	0	high	low	med	5	low	mod	mod
Ob 22 (H)	high	high	low	low	low	1	0	0	0	0	high	high	high	0	high	0	high	high	high	4	high	high	high
Ob 23 (H)	high	high	low	low	low	1	1	0	0	0	high	high	high	1	high	2	high	high	high	2	high	high	high
Ob 24 (H)	high	high	low	low	low	2	1	0	0	0	high	high	high	1	high	1	high	high	high	3	high	high	high
Ob 25 (R)	high	med	low	low	low	2	0	0	0	0	high	high	high	1	high	1	high	high	high	1	mod	high	high
Ob 26 (R)	high	med	mod	low	low	1	0	0	0	0	high	high	high	1	high	2	high	high	high	2	mod	high	high
Ob 27 (R)	high	med	mod	high	low	0	2	0	0	0	mod	high	mod	1	mod	0	high	high	mod	1	low	low	low
Ob 28 (R)	high	low	low	mod	low	0	0	0	0	0	low	low	mod	3	mod	1	high	-	mod	0	mod	mod	mod
Ob 29 (R)	high	med	low	low	low	0	1	0	0	0	mod	low	high	1	high	0	mod	-	high	1	mod	low	low
Mitchell																							
Ob 15	high	low	low	low	mod	0	0	0	0	0	low	low	mod	0	low	1	low	n/a	low	n/a	mod	low	low
Ob 20	high	med	low	low	low	0	0	0	0	0	low	low	low	0	low	0	low	n/a	low	n/a	n/a	n/a	n/a
Ob 24	high	low	low	low	mod	0	2	0	0	0	mod	low	low	0	high	2	low	n/a	low	n/a	mod	mod	mod

Key

ATT	attention problems	IP	interfered with/ignored peer	MB	monitoring behaviour	Dem	teacher demonstration
IMP	impulsivity evident	ImP	imitated peer	TR	teacher redirection	TS	structured task setting
HYP	hyperactivity evident	NP	received negative from peer	DL	direct language	TAA	teacher approached/assisted
AT	approached teacher	FS	formality of setting	PI	positive interactions	MM	maintenance of momentum
IIP	initiated positive interaction with peer	PS	planned seating	R	use of routines	FF	frequency of feedback
						PF	process feedback

Relationship between Periods of Time on Task greater than 70% and Target Student (Year 6), Peer, Classroom and Teacher Variables

Student Name and Observation Number	Task match	Task de-mand	Target Student Factors							Peer Fact-or	Physical environ-ment Factors		Teacher Managing Factors					Teacher Instructional Factors					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Eric			ATT	IMP	HYP	AT	IIP	IP	ImP	NP	FS	PS	MB	TR	DL	PI	R	Dem	TS	TAA	MM	FF	PF
Ob 1	high	high	low	low	low	0	1	0	1	0	mod	mod	mod	0	high	2	high	high	high	4	high	high	high
Ob 2	high	med	low	low	low	13v	0	0	0	0	mod	mod	high	0	high	3	high	n/a	high	n/a	high	high	high
Ob 3	high	high	low	low	low	0	0	0	0	0	mod	mod	high	0	high	1	high	high	high	2	high	mod	high
Ob 4	high	med	mod	low	low	0	0	0	0	0	mod	mod	high	0	high	2	high	high	high	3	mod	high	high
Ob 5	high	low	low	low	low	0	0	0	0	0	low	low	high	0	low	1	mod	n/a	low	1	n/a	n/a	n/a
Ob 6	high	high	low	low	low	0	1	0	2	0	mod	mod	high	0	n/a	0	high	high	high	0	high	high	high
Ob 7	high	med	low	low	low	7v	0	0	0	0	mod	mod	high	0	high	1	high	high	high	3	high	high	high
Ob 8	high	low	low	low	low	8v	0	0	0	0	mod	mod	mod	0	high	2	mod	high	mod	3	high	n/a	n/a
Ob 9	high	high	low	low	low	0	0	0	0	0	mod	mod	mod	0	high	0	high	low	low	0	high	mod	?
Ob 10	high	high	mod	low	low	n/a	0	0	0	0	mod	mod	high	0	high	2	high	n/a	high	1	high	high	high
Ob 11	high	high	low	low	low	0	0	0	0	0	mod	mod	mod	0	high	0	high	low	high	0	high	high	high
Ob 12	high	high	low	low	low	8v	1	0	1	0	mod	mod	high	0	high	0	high	high	high	2	mod	n/a	n/a
Ob 14	high	med	low	low	low	4v	0	0	0	0	mod	mod	high	0	high	1	high	high	high	4	high	high	high
Ob 15	high	med	low	low	low	0	0	0	0	0	low	low	high	0	high	0	mod	n/a	high	2	mod	n/a	n/a
Ob 16	med	low	low	low	low	0	0	0	3	0	mod	low	high	0	high	2	mod	high	mod	1	mod	n/a	n/a
Ob 17	high	med	low	low	low	2v	0	0	0	0	mod	mod	high	0	high	1	high	high	mod	2	mod	mod	high
Ob 18	high	high	low	low	low	0	0	0	0	0	mod	mod	high	0	high	1	high	n/a	high	2	high	high	high
Ob 19	high	med	low	low	low	0	0	0	0	0	mod	mod	low	0	?	0	mod	n/a	high	0	mod	?	?
Ob 20	med	med	low	low	low	0	0	0	0	0	mod	low	high	0	?	0	low	n/a	low	0	mod	n/a	n/a
Ob 21	med	med	low	low	low	0	0	0	0	0	mod	low	high	0	?	0	low	n/a	low	0	mod	n/a	n/a

Key for all Summary Tables

ATT	attention problems	IP	interfered with/ignored peer	MB	monitoring behaviour	Dem	teacher demonstration
IMP	impulsivity evident	ImP	imitated peer	TR	teacher redirection	TS	structured task setting
HYP	hyperactivity evident	NP	received negative from peer	DL	direct language	TAA	teacher approached/assisted
AT	approached teacher	FS	formality of setting	PI	positive interactions	MM	maintenance of momentum
IIP	initiated positive interaction with peer	PS	planned seating	R	use of routines	FF	frequency of feedback
						PF	process feedback

APPENDIX H

ACADEMIC ENGAGED TIME SUMMARY TABLE

Relationship between Periods of Academic Engaged Time Greater than 70% and Student, Classroom and Teacher Variables

Student Name and Observation Number	Task Factors		Target Student Factors							Peer Factor	Physical Environment Factors		Teacher Management Factors					Teacher Instructional Factors					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	Task match	Task demand	Att	Imp	Hyp	AT	IIP	IP	ImP	NP	FS	PS	MB	TR	DL	PI	R	Dem	TS	TAA	MM	FF	PF
Kyle																							
Ob 22	high	med	mod	mod	mod	1	0	0	1	0	mod	mod	high	1	high	0	high	high	high	0	high	med	med
James																							
Ob 24	high	med	low	low	low	1	0	0	2	0	mod	mod	high	0	high	1	mod	n/o	mod	1 ext	mod	high	high
Ricky																							
Ob 17(H)	high	med	low	mod	low	4	1	0	0	0	high	high	high	2	high	0	high	high	high	3	high	high	high
Ob 19(H)	high	high	low	low	low	2	0	0	0	0	high	high	high	1	high	3	high	high	high	2	high	high	high
Ob 20(H)	high	high	low	low	low	2	2	0	0	0	high	high	high	2	high	1	high	high	high	5	high	high	high
Ob 22(H)	high	high	low	low	low	1	0	0	0	0	high	high	high	0	high	0	high	high	high	4	high	high	high
Ob 26(R)	high	med	mod	low	low	1	0	0	0	0	high	high	high	1	high	2	high	high	high	2	high	high	high
Mitchell																							
Ob 20	high	med	low	low	low	0	0	0	0	0	low	low	mod	0	low	1	low	n/a	n/a	n/a	n/a	n/a	n/a
Eric																							
Ob 2	high	med	low	low	low	13v	0	0	0	0	mod	mod	high	0	high	3	high	n/a	high	n/a	high	high	high
Ob 3	high	high	low	low	low	0	0	0	0	0	mod	mod	high	0	high	1	high	high	high	2	high	mod	high
Ob 6	high	high	low	low	low	0	0	0	2	0	mod	mod	high	0	n/a	0	high	high	high	0	high	high	high
Ob 7	high	med	low	low	low	7v	1	0	0	0	mod	mod	high	0	high	1	high	high	high	3	high	high	high
Ob 9	high	high	low	low	low	0	0	0	0	0	mod	mod	mod	0	high	0	high	n/a	high	0	high	high	high
Ob 10	high	high	mod	low	low	n/a	0	0	0	0	mod	mod	high	0	high	2	high	n/a	high	1	high	high	high
Ob 11	high	high	low	low	low	0	0	0	0	0	mod	mod	high	0	high	0	high	none	high	0	high	mod	?
Ob 12	high	high	low	low	low	8v	1	0	1	0	mod	mod	mod	0	high	0	high	high	high	2	high	high	high
Ob 14	high	med	low	low	low	4v	0	0	0	0	mod	mod	high	0	high	1	high	high	high	4	high	high	high
Ob 18	high	high	low	low	low	0	0	0	0	0	mod	mod	high	0	high	1	high	n/a	high	2	high	high	high
Ob 19	high	med	low	low	low	0	0	0	0	0	mod	mod	low	0	n/a	0	high	n/a	high	0	mod	n/a	n/a

Key

ATT	attention problems	IP	interfered with/ignored peer	MB	monitoring behaviour	Dem	teacher demonstration
IMP	impulsivity evident	ImP	imitated peer	TR	teacher redirection	TS	structured task setting
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						PF	process feedback