Faculty of Education

Classroom Environment and the Transition to Secondary Schooling

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ABSTRACT

This study was undertaken to investigate changes in classroom environment as students move between upper primary and lower secondary school in selected schools in South Australia. A new instrument, the Middle School Classroom Environment Indicator (MSCEI), was devised to measure students' perceptions of particular aspects of classroom environment that were considered important in this transitional phase along the educational continuum. Actual and preferred versions of the instrument were used longitudinally with students in Grade 7 and again in Grade 8 in order to determine whether students perceived an improvement or deterioration in salient aspects of their classroom climate. Also, student satisfaction was assessed before and after transition. Quantitative data from the questionnaire were supported by qualitative data gathered through discussions with teachers, students and administrators, as well as classroom visits before and after transition into secondary school.

Research questions were answered through numerous statistical analyses of questionnaire data: item analysis, factor analysis and analysis of variance for establishing the reliability and validity of the MSCEI; simple correlation and multiple regression analyses for investigating associations between student satisfaction and classroom environment scales; and paired *t* tests to compare and contrast perceptions of classroom environments in Grade 7 and Grade 8.

The sample consisted of 311 students in six schools in Grade 7 and 575 students in six schools in Grade 8. The schools represented different enrolment profiles and distinctive settings. The schools involved were two single-sex boys' schools, one single-sex girls' school, and three co-educational schools. Five of the six schools in the

sample had both primary and secondary classes in the school, while one school terminated enrolment as a primary school in Grade 7 and students moved to a new secondary setting in Grade 8.

Classroom environments in secondary settings were generally perceived less favourably, given rapid lesson turnover, multiple specialist teachers and larger school sizes, which were associated with a perceived increase in alienation. These findings seem generally consistent across the sample of schools involved in the study, although variations were evident in different schools with differing enrolment profiles and internal arrangements for catering for students moving from primary to secondary schooling. Satisfaction was closely associated with the classroom environment dimensions of affiliation and autonomy in Grade 7, and with affiliation, autonomy and teacher support in Grade 8.

Given the extensive work undertaken by researchers and scholars in the area of middle schooling, this study holds significance for teachers and administrators who wish to promote effective and manageable classroom experiences for students as they move from upper primary to lower secondary schooling.

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CHAPTER 1

Background, Context and Rationale

1.1 Introduction

This study was undertaken to investigate changes in classroom environments as students move between upper primary to lower secondary school in South Australia. This has been traditionally regarded as something of a disjuncture along the formal educational continuum, during what has been more recently regarded as the middle years of schooling (Burke & Jarman, 1994; Carnegie, 1989; Cormack, 1996a; Cumming, 1996a, 1996b; Eyers, Cormack & Barratt; 1993; Hargreaves & Earl, 1990, 1994; Hill, 1995; Stewart & Nolan, 1992). Specific aspects of classroom environment were measured to see if there were noticeable student-perceived differences between classrooms at Grade 7 and Grade 8. This chapter briefly discusses the background to the study (Section 1.2), differing models that are utilised in schools to deal with this important transition (Section 1.3), a range of issues considered important to middle schooling (Section 1.4), a rationale for the study (Section 1.5), the nature of past and contemporary classroom environment research (Section 1.6), a summary of research questions associated with this study (Section 1.7), some limitations of the study (Section 1.8) and the structure of the thesis (Section 1.9).

1.2 Background

That quite different educational experiences are provided in primary and secondary schools in South Australia is attested to by the structural arrangements that underpin pedagogy and the assumptions that are made about students as learners. In the past,

primary schools at all three levels of early childhood, junior primary and upper primary education have adopted a *nurture* ethic, placing students in the secure environment of one classroom predominantly with one teacher for a range of subjects. The task of the teacher is to get to know each student as an individual, to provide a stable and rich classroom environment that will encourage cognitive and affective learning, and to assist the student to develop positive attitudes towards self and others. The opportunity for the teacher to know students on an intimate level, to develop relationships and to develop an appreciation of individual learning styles is enhanced by the large amount of time that is spent by one teacher with a relatively small number of students.

Secondary schooling tends to present different assumptions associated with students as learners and, therefore, a different educational profile. Subject specialist teachers are introduced to induct students into the more abstract disciplines of science, mathematics, technology, the arts, humanities, history and geography, often in an environment that provides rapid lesson turnover, use of multiple classrooms and specialist teaching facilities, and a wide variety of teachers. It is alleged that teaching methodologies in secondary school are different than those utilised in primary classrooms, and that an emphasis on content and curriculum at the secondary level implicitly provides a shift in pedagogical focus that cultivates different classroom environments.

Past research into learning environments has sought to identify specific aspects of the classroom climate which maximise student satisfaction and learning outcomes (Fraser, 1994; Fraser & Chionh, 2000; Fraser & McRobbie, 1995). In order for students to engage in effective cognitive learning, they need to be actively involved in the learning process, as this encourages specific kinds of teaching practices and cultivates particular classroom environments. Specific characteristics that have been identified as promoting cognitive and affective learning outcomes (Fraser, 1994) include:

- Personalisation, with teachers providing opportunities for interaction and demonstrating care for student welfare and growth;
- Participation, with teachers consciously designing activities that will encourage students to be involved in classroom activities;
- Order and organisation, with the classroom being well organised and having clear parameters for student behaviour and management.

Specific characteristics of classrooms not only produce effective learning environments, but also implicitly reflect epistemological paradigms in the learning processes. It is widely accepted that knowledge is personally constructed and socially mediated (Driver & Oldham, 1986; Linn & Burbules, 1993) and that, for effective learning to take place, high-quality opportunities for both to occur inside the classroom need to be provided. In recent years, educators have been forced to value and encourage the social aspects of learning, including negotiation, interaction and consensus building, which assist students to participate effectively, meaningfully and cooperatively in the learning process (see Section 6.5.3). Anecdotally, this has become something of a feature of primary schooling in recent years, but there are doubts about the efforts that have been made to incorporate such emphases into secondary education.

Relevant to this study is the way in which classrooms in upper primary and lower secondary schooling cater for these aspects of teaching and learning. Investigation of aspects of classroom environments, such as the degree of personalisation, participation and social engagement, enables the researcher to elicit from the students themselves the way in which they perceive their learning environments, together with the degree of satisfaction that they experience as they move from one educational experience in Grade 7 to another in Grade 8.

The remaining part of this chapter discusses various school-based models that have been adopted to deal with managing students in transition from primary to secondary

school, together with the rationale for this study and key questions that this particular study investigated.

1.3 Middle Schooling

The formalisation of middle schooling as a conceptual framework to approach the education of adolescents can be found in the Carnegie Report (1989), which drew attention to the inadequacies of schooling in North America and the needs of adolescents between the ages of 10 to14 years. Over the past decade, considerable interest and scholarship have focussed on middle schooling (Carnegie, 1989; Cormack, 1996a, 1996b; Cumming, 1996a, 1996b; Eyers, Cormack & Barratt, 1993; Hargreaves & Earl, 1990; Lounsbury & Clark, 1990; Stringer, 1997) to understand more fully the nature of change concomitant with the onset of adolescence, and the most effective educational arrangements that will enhance cognitive development and self-esteem. A considerable body of interest has also sprung up over the last decade that has identified gender-specific implications of educating boys and girls (Buchanan, 1993; Davies, 1984; Gilbert, 1992; Rhodes, 1994) which has afforded a greater awareness and sensitivity to the developmental provision of education at different chronological points.

One of the most influential scholars in Australia in the early 1990s who has impacted significantly on the practical arrangements developed by schools to provide continuity and sequence across the middle years is Vivian Eyers (1993). Subsequent to the release of the Report of the Junior Secondary Review (1993), considerable activity ensued among educational administrators and teachers to embrace the importance of middle schooling as an independent phase of education, wedged between primary and secondary schooling, that needed quite specific educational experiences, curriculum and teaching methodologies. The rationale for middle schooling as a distinct educational entity was both persuasive and powerful: that students in the early

adolescent years were 'different' physically, emotionally and psychologically from their counterparts in junior primary school, and quite obviously at a different developmental stage from those who had undergone puberty and the intellectual and social maturity consistent with senior secondary schooling. At the same time, the middle years began to be touted as being the most critical in the long-term development of adulthood, yet lacked any specific educational provision along the way.

In response to the Report of the Junior Secondary Review, some educational administrators in Reception to Grade 12 schools across Australia segmented their arrangements, adopting three formal units of primary (including the divisions of lower primary, middle primary and upper primary), middle school and secondary education. Some administrators, strongly convinced by the literature and research, responded by constructing self-contained educational modules in Grades 7, 8 and 9 and dedicated teachers specifically to this area, as had been done for teachers in primary and secondary schools for decades. Others accepted the philosophy of middle schooling without creating a separate middle school in an attempt to respond to the multifarious needs of adolescents between Grade 6 and Grade 9, while others yet again were wary of leaping into an educational 'fad' and did little to alter the traditional model of schooling that has been characteristic of the last 50 years. Some of the different approaches that have been adopted in response to middle schooling, many of which are attributable to the Report of the Junior Secondary Review, include:

- *The formation of integrated educational units.* Two schools in South Australia have adopted a model of integrating students and teachers to form a self-contained educational entity, where teachers specialise in core modules of curriculum and teach large numbers of students in teams. Teachers who are part of the unit, but who are not conducting a module of work at any given time, act as supervisors and 'assistants', so that the team of teachers can work unilaterally with a number of classes at the one time. The purpose behind this model is deliberately to expose students between Grade 7 and Grade 9 to a wider variety

of teachers and engage in co-operative learning using other students as agents in the social construction of knowledge. One school, identified later as School B in this research, was included in the research sample to see whether students in integrated units held similar perceptions of the environment to those of conventional classrooms (see Section 6.4).

- *Cooperative teaching arrangements*. A number of schools have formalised a model in which classes in Grade 7 remain as separate units, but teachers specialise in certain subject areas and teach these subjects across two or three classes. Teachers who undertake Science, Computing or Mathematics, for example, will not only teach and assess the subject but, in conjunction with other subject specialists, will segment the curriculum and be collectively responsible for its delivery. The purpose behind this model is to provide a wider variety of specialist teachers and subjects in upper primary that will be encountered in lower secondary, offering a more graduated transition between curriculum and teaching arrangements characteristic of the differing regimes. In this study, data from School C reflects cooperative teaching arrangements in Grade 7 classrooms and is analysed in the context of other Grade 7 classroom environment profiles (see Section 6.5).

- *Clustered teaching arrangements*. Some schools have dedicated a cluster of teachers to the Grade 6-9 range. Teacher clustering is used from Grade 6 to expose students to a wider variety of teachers, who have subject specialisms for which they are responsible across the middle years. These teachers provide sequence and continuity of curriculum and will ideally be associated with particular students on an ongoing basis throughout the middle years. The rationale behind this model is to counteract the problem of alienation (Cormack, 1996a) that has been cause for much concern during the middle years of schooling. By exposing students to a group of teachers over a protracted period of time, by enhancing student-teacher relationships at a time when they

traditionally become attenuated, this model presents a structural attempt to deal with the social and psychological context of adolescence at the classroom level. School A in this study was selected because of the clustered teaching arrangements that are employed between Grade 6 and Grade 9 (see Section 6.3).

- *Discrete middle schools*. Some schools have formed a discrete entity known as the middle school. While few schools have chosen to adopt this more extreme framework, there is a rationale that purports a need to cater quite independently and specifically for students as they embark upon the manifold physical, social, psychological, intellectual and spiritual changes associated with adolescence.

- *Traditional model of schooling*. A number of schools, particularly those with long-established traditions, have chosen to maintain the existing framework of a primary and a secondary school. Yet, mindful of recent research into middle schooling, these schools accept the principles of student independence and autonomy, cooperative learning and subject specialist provision, but they do so at the classroom level, rather than invoke alternative structures to deal with middle schooling. The rationale for some schools retaining their traditional structure is that the educational offering has produced young men and women who have achieved well academically and become well integrated and respected members of their respective communities. Such schools maintain that not only have students had little difficulty in making adjustments between different stages of the schooling system, but they have benefited significantly in graduating from a primary phase of schooling to a secondary phase.

While these represent some of the responses to middle schooling, they are by no means the only ones. Some educational administrators and teachers have engaged in 'peacocking', picking selected aspects of middle schooling and applying them in a way which best suits the context of the school and its students. Despite the existence of alternative models and emphases in middle schooling, few schools over the last decade

have been unaffected by the informed discussion that has pervaded the educational community about the critical years associated with adolescent education, and the graduation between primary and secondary frameworks.

1.4 Middle School Issues

Middle schooling, as a defined entity, raises a number of issues that become addressed at a management and teaching level. While these issues are not removed from other stages of education, they find a particular expression during the middle years at a time when adolescents are experiencing rapid and complex maturation and growth. Issues that are pertinent to middle school research include:

- *Contextual issues.* Schools, be they Government, Independent or Catholic, possess traditions that influence the style and nature of teaching and learning at the classroom level. This is reflected in the profile of the students and the socio-economic background of the parents, as well as inherited traditions that influence attitudes towards and responses to contemporary educational thought. It is important, therefore, in a study of this kind, to select schools which represent a variety of contexts, including varying traditions, differing enrolment profiles (single-sex boys, single-sex girls, co-educational) representative of quite different socio-economic backgrounds. Past research into the context of schooling (Fraser, 1978; Lunn, 1972) has yielded important information associated with the role of gender and socio-economic background in influencing learning outcomes and student performance. These varying influences affect the classroom environment which is both a psychosocial context and a determinant of learning (Fraser, 1994).

- *Pedagogical issues.* Divergent teaching approaches and methodologies impact on the classroom and affect students' perceptions of the environment. Empirical

and qualitative studies into classroom environment research indicate that environment dimensions are effective indicators of teaching and learning (Aston, 1965; Fraser & Fisher, 1982a, 1982b; Fraser & Tobin, 1991; Trickett & Moos, 1973). Teacher-centred approaches to learning, no longer viewed in such a favourable light in Australia, have given way to student-centred and cooperative learning modalities. Individual teachers and their ideological response to pedagogy on a day-to-day level raise important issues that are implicit to classroom environment research, as they explicitly impact on the quality and nature of the classroom environment (Ainley, 1978; Hofstein, Gluzman, Ben-Zvi & Samuel, 1980; Kelly, 1980).

- *Curriculum issues*. Classroom and school climate are affected by both the manifest and latent curriculum. Past research has indicated that curriculum emphases not only impact on student perceptions of the classroom environment, but also have a strong influence on cognitive learning outcomes (Anderson, Walberg & Welch, 1969; Brekelmans, Wubbels & Creton, 1990; Fraser & Butts, 1982; Gardner, 1976; Fraser, 1976a, 1976b; Tisher & Power, 1978). This not only raises the issues of negotiation with students in curriculum design and delivery, but also the methods of investigation and learning that are adopted at the classroom level. There is a further aspect to this issue that becomes apparent across the middle years: in the primary settting, there is ostensibly an equal if not greater emphasis on process rather than content learning, while secondary schooling has been criticised for teaching emphases that are more 'syllabus' driven. These varying emphases implicitly affect classroom environment and perceptions of the environment.

- *Epistemological issues*. Recent studies into classroom environments have tried to view the epistemological assumptions that find expression in the teaching arrangements in classrooms (Dryden & Fraser, 1996, 1998; Kim, Fisher & Fraser, 1999; Taylor, Dawson & Fraser, 1995; Taylor, Fraser & Fisher, 1995).

Traditional epistemologies are being supplanted by contructivism, which maintains that students interpret the world on the basis of knowledge that they have already constructed through a process which involves negotiation and co-construction of knowledge. Teachers and students are becoming aware of the need for critical, integrated and active roles in interpreting the cultural framework of the classroom and building on knowledge acquisition, both in the process of learning and through curriculum. Students in School D in this research are exposed to constructivist learning through the Primary Years Program (PYP) and the Middle Years Program (MYP). An analysis of student perceptions of constructivist classrooms is presented in Section 6.6 of this thesis.

1.5 Rationale for the Study

In the face of increasing concern about the adequacy of educational management and provision for adolescents, research into the area has the potential to deepen understanding and awareness of this important phase of education. Whereas much energy has been devoted towards early childhood education, and the structural implications of senior secondary schooling are driven largely by public examination authorities and statutory boards of education, the middle years until recently had been relatively under-researched and something of a forgotten realm of educational scholarship. To undertake research into this area is not only to redress the imbalance of recent decades, but to open up a range of issues that affect student learning, student perceptions and attitudes to learning during a key developmental stage, as well as the transition from one schooling framework to another. Even to accept the concept of middle schooling is to deconstruct the institutionalised tripartite system of primary, secondary and tertiary education, and in its place to insert and institutionalise another discrete phase of the education process. This is something which a number of educational administrators and teachers have yet to do.

Of the research that has been undertaken into middle schooling, much has centred on the macro-conceptualisation of the school or the psychology of adolescence (Alderman & Maehr, 1994; Burke & Jarman, 1994; Cormack, 1996a; Cumming, 1994; Eyers, Cormack & Barratt, 1993; Hargreaves & Earl, 1990; Lesko, 1994; Lounsbury & Clark, 1990; Merton, 1994; Mieier, 1990; Stringer, 1997) rather than the micro-conceptualisation of the classroom. While general trends associated with the transition between primary school and secondary school have been the object of attention, and while there have been important findings consistent with this research, little has been undertaken in the specific field of classroom environment. Because students spend the majority of their time at school within the confines of the classroom, specific research into the nature of classroom environments in the middle years presents the justification for the present study. A greater understanding of the psychosocial features of classrooms in upper primary and lower secondary schooling, respectively, has the potential to yield significant information, not only about the perceptions of the environment held by the milieu participants (Znaniecki, 1968), but also about the ways in which this transition can be managed more effectively.

Of the few studies that have been mounted into classroom environments in upper primary and lower secondary grades, indications are that lower secondary classrooms are perceived less favourably than primary schools. Research conducted by Feldlaufer, Midgley and Eccles (1988) and Midgley, Eccles and Feldlaufer (1989) in the United States indicated that the transition to 'Junior High School' (sic) produced student dissatisfaction with the learning environment because there were fewer opportunities for input and interaction, task organisation became excessive and student-teacher relationships deteriorated noticeably. In a more recent study undertaken in Australia, Ferguson and Fraser (1996, 1998) discovered that students entering high school encountered less favourable learning environments as a result of the subject specialisms that they are exposed to, and that generally the learning environment was less cohesive, less friendly and understanding, and engendering a higher degree of friction and admonishment at the classroom level. However, Ferguson and Fraser found that the

magnitude of the changes in classroom environment across transition varied with student gender and the size of the schools involved in the transition.

Despite the relative paucity of classroom environment research in the middle years of schooling, some important findings related to the distinctive nature of primary as distinct from lower secondary learning environments have been reported and offer a basis for further investigation and research. Variations in particular psychosocial features of classrooms have been detected that offer administrators and teachers opportunities for change in order to accommodate the important transition between primary and secondary schooling more effectively. Further research is likely not only to add depth to the studies that have been mounted, but also to add empirical strength to the anecdotal evidence that already exists in this area.

The present study aimed at providing further information on teaching and learning in upper primary and lower secondary classrooms with a view to suggesting ways to improve the transition that students often find difficult and educationally disengaging.

1.6 Past Classroom Environment Studies

Research into classroom environments began some 30 years ago. Since that time, a number of instruments have been developed to measure specific or general aspects of the learning environment, including the Learning Environment Inventory (LEI) (Walberg & Anderson, 1968), Classroom Environment Scale (CES) (Moos & Trickett, 1974), My Class Inventory (MCI) (Fraser & O'Brien, 1985), Student Classroom Environment Measure (SCEM), Teacher Classroom Environment Measure (TCEM), and Observer Classroom Environment Measure (OCEM) (Feldlaufer, Midgley & Eccles, 1988), Individualised Classroom Environment Questionnaire (ICEQ) (Fraser, 1981a, 1990), Science Laboratory Environment Inventory (SLEI) (Fraser, Giddings & McRobbie, 1993), Computer Classroom Environment Inventory (CCEI) (Maor &

Fraser, 1996) and Questionnaire on Teacher Interaction (QTI) (Wubbels, Creton & Hooymayers, 1985). Some of these instruments are designed specifically to measure aspects of the learning environment such as the nature of science laboratory classrooms (SLEI) or the quality of student teacher relationships (QTI), while others have been developed in order to elicit general information about the quality and nature of the learning environment (CES, MCI). Most recently, an instrument has been devised to measure the degree of constructivist learning at the classroom level. The Constructivist Learning Environment Survey (CLES) (Taylor, Dawson & Fraser, 1995) was developed to gauge the level of implementation of certain epistemologies at the classroom level.

It is sometimes considered worthwhile to capitalise on existing knowledge or offer subtle refinements to instruments to pursue particular aspects of classroom environment research. In developing the What Is Happening In This Class (WIHIC) questionnaire, Fraser, Fisher and McRobbie (1996) adapted scales from previous instruments and melded items that were regarded as possessing contemporary importance. These instruments have been used in multifarious ways to elicit information from different classroom perspectives about psychosocial aspects of the learning environment: how to interpret it and to alter it, as well as how to enhance students' attitudes towards learning. Findings from this considerable body of research over the years have assisted scholarship and been responsible for a number of practical developments in managing curriculum implementation at the classroom level (Fraser, 1976a, 1976b; Tisher & Power, 1978; Walberg & Welch, 1972) through to altering aspects of the environment to create classrooms that are more responsive to students' needs (Fraser, 1981a, 1981b). Research conducted to create more effective classroom environments has been mounted at different levels of education including the early childhood (Fisher, Fraser & Basset, 1995), primary (Fraser & Deer, 1983), secondary (Deer, 1980; Fraser, Seddon & Eagleson, 1982; Woods & Fraser, 1996) and tertiary (De Young, 1977; Marks, 1970; Yarrow, Millwater & Fraser, 1997; Pace & Stern, 1958; Thistlewaite, 1962) levels.

Classroom environment studies have been utilised in a variety of ways to deepen understanding of participants' perceptions of the environment and to interpret important influences on teaching and learning that affect perceptions of the environment. The extent of research and level of understanding that has been gained as a result of these studies are discussed at length in Chapter 2, particularly Section 2.5.

The present study aimed to activate and apply a number of the principles of past research to provide further information about the unique classroom environments in upper primary and lower secondary school, and to see whether the transition to secondary school affects students' perceptions of particular dimensions of their classrooms. In addition, this study aimed to determine which aspects of the classroom environment are most closely correlated with student satisfaction at both Grade 7 and Grade 8 and to see whether perceptions of satisfaction change during the transition to secondary school.

1.7 Research Questions

A sample of schools was selected for this study that represent different enrolment profiles and employ various frameworks to deal with students moving between primary and secondary school. The research was designed to measure students' perceptions of Grade 7 and Grade 8 classrooms and to see if discernable trends in classroom environments could be identified at different levels of education, and to see if common transition experiences between primary and secondary school were felt by students. Specific research questions are listed below:

1. Is it possible to design a valid and appropriate classroom environment questionnaire to assess students' changing perceptions across the transition from primary to secondary school?

2. Do differences exist between perceptions of actual and preferred classroom environments in Grade 7 and Grade 8?

3. Does the transition to secondary school affect students' perceptions of the actual classroom environment?

4. Do two different subjects in Grade 8 (namely, Mathematics and English) have different classroom environment perceptions?

5. What dimensions of classroom environment in the transition to secondary school are most closely associated with student satisfaction?

6. Do different site-specific approaches to middle schooling provide more favourable transition experiences for students moving between primary and secondary school?

1.8 Limitations of this Study

Because the sample selected for this study was relatively small yet diverse, findings should not be generalised to all students in Grade 7 and Grade 8. A concerted effort was made to locate schools which employ different aspects of the middle schooling concept and to investigate classroom environments cultivated by them. As such, the outcomes of this research must be confined to the schools and students who formed the sample. While schools from the Catholic Education system and schools from the State Department of Education were involved, schools from the Independent Schools Board were not. Given the research into school context (as outlined in Section 1.4), it is important to make assertions and judgements based upon the schools involved and not to extrapolate findings to others in alternative sectors. For example, one of the schools from the State Department of Education was included in the research sample because it

formed an integrated unit of management of students between Grade 7 and Grade 8. It would be erroneous to generalise about integrated units per se in middle schools, because other schools not included in this sample draw from a different parent and student clientele in a different socio-economic and geographical region of Adelaide.

The number of students included in this study was not large relative to some classroom environment studies conducted in the past. Quantitative research methods involving course-grain meta-analyses (Dryden & Fraser, 1996) indicate that the larger the size of a representative sample, the greater the validity of the inferences that can be drawn. While the present study involved quantitative information from a sample of somewhat limited size, this research was supported by qualitative data in the form of classroom observation and discussions with students, teachers and school administrators, as recommended by Tobin and Fraser (1998). Fine-grain research techniques (Fraser, 1999a) drawing on the interpretive methods of Erickson (1986) have the advantage of incorporating a rich body of qualitative knowledge into this study.

While the longitudinal implications of the study were considered at length, the timing associated with the application of the questionnaires could have influenced student responses on the instrument used to measure classroom environment. It was considered important to administer the pretest questionnaires at the end of Grade 7, that is, in early Term 4 of the year in which students were leaving primary school. This was at a time when most schools were undertaking 'graduation' activities, to acknowledge students leaving the educational phase of primary school and moving into the secondary. The posttest questionnaires were administered six months into Grade 8, at a time that was judged to be valid for research purposes as the novelty of the early weeks of transition had worn off, and it was assumed that students would have settled into secondary schooling and would be familiar with their classroom environments. This was undertaken towards the end of the Term 2 of Grade 8. Were the questionnaires to be administered at different times to those undertaken in this study, results and findings could have been different.

Further specific limitations associated with questionnaire design and interpretation are reviewed in Section 7.9 of this thesis.

Given these limitations, the findings of this research have the potential to act as valuable indicators of classroom environments in upper primary and lower secondary schools, and to suggest whether or not differences exist between the schools which formed part of this study.

1.9 Summary of Thesis

This study focussed on upper primary and lower secondary classroom environments and student perceptions of psychosocial features of those environments while in transition between the two levels of schooling. The research was designed to elicit further information about the distinctive environments in upper primary and lower secondary school and how student perceptions of the classrooms are affected by the transition.

This chapter discussed the background to the study and places the context of the research in the emerging field of scholarship on middle schooling. Different models and issues associated with middle schooling provide the rationale to investigate more closely the effectiveness of various frameworks in assisting students make the transition between primary and secondary school. This chapter has also introduced the concept of classroom environment studies and briefly overviewed some past research in the area. The research questions which guided the study also were articulated. These research questions provide the basis for the investigation and analysis in the following chapters. Limitations of this research have also been acknowledged, particularly the danger in generalising information from the research schools which have unique and established contexts that are site-specific and pertinent to the students in those schools.

Chapter 2 reviews the literature associated with classroom environment studies. This includes the history of classroom environment research and theoretical principles upon which it is based, as well as contemporary trends in research. Chapter 3 describes the research methodology, some of which (e.g. preliminary field-testing) makes this study distinctive (see Section 3.4.1). Chapter 4 outlines in detail the development and validation of the instrument used in this study. As the current study used a new instrument entitled the Middle School Classroom Environment Indicator (MSCEI), extensive statistical interrogation was required to ensure that the instrument conformed to rigorous standards of reliability and validity. Chapter 5 presents the aggregated quantitative results of this study which addresses a number of the research questions delineated in Section 1.7. Chapter 6 discusses the implications of the qualitative data in relation to individual school profiles gleaned from the questionnaire, and addresses the remaining research questions. Chapter 7 discusses the findings of the study, highlights practical implications, provides recommendations for future research into classroom environments in middle schooling and offers concluding remarks.

CHAPTER 2

Review of Related Literature

2.1 Introduction

Measuring and interpreting the effectiveness of teaching and learning is a problematic exercise, made so by the indices that are used to determine the efficacy of educational environments and the context in which pedagogy takes place. Academic achievement and other defined learning outcomes (Johnson, Maruyama, Johnson, Nelson & Skon, 1981; Keyser & Barling, 1981) can present a rather narrow set of criteria for making judgements about the effectiveness of education. We also need the assessment and analysis of a range of characteristics associated with the educational environment that are implicit to the teaching and learning process. Past research (Fraser & Deer, 1983; Fraser, Docker & Fisher, 1988) has indicated that classroom environments are useful predictors of student learning, and that modification to salient aspects of the classroom can alter student perceptions of the environment as well as learning outcomes.

The aim of this study was to examine student perceptions of the classroom environments in upper primary and lower secondary school, respectively, and to see whether discernible differences between primary and secondary classes exist in the dimensions of these environments. Further, inferences can be made as to whether differences in particular aspects of the classroom environment provide difficulties for students making the transition between primary and secondary schools.

This chapter discusses the literature associated with classroom environment studies. It begins by reviewing the historical background of human environment research (Section

2.2), and then it considers the theoretical principles upon which contemporary classroom environment studies are based. The rest of the chapter presents an overview of the extensive research into classroom environments that has been undertaken over the last three decades, including the various instruments that have been developed and used to assess classroom environments (Section 2.3), important developments in conceptualising and applying learning environment instruments (Section 2.4), the use of information from these instruments to interpret and alter classroom environments (Section 2.5), and studies that have been undertaken of classroom environments in middle schools (Section 2.6). This chapter also outlines key issues that have been identified in literature associated with middle schooling (Section 2.7) that form the bases of classroom environment studies undertaken in the present research.

2.2 Historical Background

The theoretical foundations of human environment studies were laid nearly three quarters of a century ago and have been part of academic discourse and research since. Working under the assumption that behaviour, personality and environment provide the rubrics of human interaction, Lewin (1936) devised the formula, B=f (P, E). In attempting to explain human behaviour, Lewin purported that personalities (P) and environments (E) are interactive influences that determine behavioural outcomes (B) of the human agents who comprise any given social setting. While this early formulation did not account for the critical dialectic of change, it proved an important conceptual step in codifying human environments as entities worthy of exploration and analysis.

Taking Lewin's work further, Murray (1938) identified discrete conceptual frameworks that would allow for investigation and understanding of any environment. By distinguishing between *alpha press*, for which the perception of the environment is interpreted from the standpoint of the detached observer, and *beta press*, for which the perception of the environment is elicited from the milieu inhabitants, Murray produced

important methodological frameworks from which to consider and interpret human environments. Furthermore, Murray developed the notion of 'needs-press' theory, contending that individuals move in the direction of goals, which social environments either cultivate or inhibit. Needs-press theory assumes that all members of any given environment possess personal ambitions and expectations that will either be fulfilled or frustrated — an assertion that could need substantiation or rejection in its own right.

Capitalising on this evolution of human environment theory, Stern, Stein and Bloom (1956) differentiated between aspects of the environment pertinent to the individual, *private beta press*, and those that were commonly perceived by the group, *consensual beta press*. It became apparent that it was not only possible and valid for individuals to identify different realities, but that, given the idiosyncratic nature of human beings, it was possible for the press of certain environments to favour development of some individuals while limiting that of others. Whether this be intrinsic to the theoretical premises that undergird human environment studies, or the dynamic that operates in situ, it is fair to assume that there is reliability and substance to these assertions. Getzels and Thelen (1960) took the situational and methodological frameworks further by adding predictive capacity, suggesting that some environment perspectives predispose certain individuals to thrive and others to experience dissatisfaction and frustration.

These embryonic conceptualisations have been responsible for a profusion of research studies in a diverse range of situations. Two complementary research stands were mounted in the United States, one intended to investigate environment dimensions in psychiatric hospitals (Moos & Houts, 1968) and correctional institutions (Moos, 1968), and the other intended to assess environments in educational institutions and the impact of the environment on learning (Insel & Moos, 1974; Moos, 1973, 1978, 1980; Moos & Trickett, 1974; Walberg, 1968).

Moos (1973) developed a more sophisticated codification of human environment, involving the three aspects of personal, relational, and system maintenance. Moos' enduring contribution to understanding social and human environments was a three-part conceptual delineation between discrete aspects of the environment that involved:

- *Relationship Dimension* — which identifies the nature and intensity of personal relationships and the extent to which people within the environment support and help each other.
- *Personal Development Dimension* — which assesses directions along which personal growth and self-development occur.
- *System Maintenance and Change* — which assesses the extent to which the environment is orderly, clear in expectations, maintains control, and is responsive to change.

Moos' dimensions of human environments have underpinned a great deal of the research and instruments that have been developed in order to more fully understand and interpret the nature of educative processes at the classroom level. These dimensions have found expression in a range of environment studies mounted over the last 30 years, particularly in the investigation of educational environments. Table 2.1 presents information on nine classroom environment instruments used to measure and analyse either general or specific aspects of the learning environment. The table outlines the name of each instrument, the level for which it has been devised, and the number of items per scale, as well as a classification of scales according to Moos' typology of human environments (1973, 1974).

Dimensions of classroom environments outlined in Table 2.1 are discussed in detail in Section 2.3 of this chapter.

Table 2.1
Scales Contained in Classroom Environment Instruments Classified According to Moos' Typology of Human Environments

Instrument	Level	Items per scale	Relationship Dimension	Personal Development Dimension	System Maintenance and Change Dimension
Learning Environment Inventory (LEI)	Secondary	7	Cohesion, Friction Favouritism, Cliqueness, Satisfaction, Apathy	Speed, Difficulty, Competitiveness	Diversity, Formality, Material environment, Goal direction, Disorganisation, Democracy
Classroom Environment Scale (CES)	Secondary	10	Involvement, Affiliation, Teacher support	Task orientation	Order and organisation, Rule clarity, Teacher control, Innovation
Individualised Classroom Environment Questionnaire (ICEQ)	Secondary	10	Personalisation, Participation	Independence, Investigation	Differentiation
My Class Inventory (MCI)	Primary	6-9	Cohesiveness, Friction, Satisfaction	Difficulty, Competitiveness	
College and University Class Environment Inventory (CUCEI)	Higher education	7	Personalisation, Involvement, Student cohesiveness, Satisfaction	Task orientation	Innovation, Individualisation
Science Laboratory Environment Inventory (SLEI)	Senior secondary Higher education	6 or 7	Student cohesiveness	Open-endedness, Integration	Rule clarity, Material environment
Work Environment Scale (WES)	School teacher, Primary, Secondary	9	Involvement, Peer cohesion, Staff support	Autonomy, Task orientation	Work pressure, Clarity, Control, Innovation, Physical comfort
School Level Environment Questionnaire (SLEQ)	Secondary	7	Student support, Affiliation, Work pressure	Professional interest, Innovation	Staff freedom, Resource adequacy, Participatory decision making

Adapted from Fraser (1994)

The Learning Environment Inventory (LEI) (Walberg, 1968) was developed to measure student perceptions of their classroom as a total entity, rather than their individual and personal response to it. This was a specific-purpose instrument that was designed to evaluate the success of the Harvard Project Physics from the standpoint of a variety of

affective and cognitive outcomes of those students involved in it, against a control cohort who were not. By comparing and contrasting the two, particularly given the emphases contained within the curriculum package, Walberg concluded that certain psychosocial features of the environment were affected by the content and emphases of curriculum, drawing a link between the nature of the classroom and the focus of learning that was imparted.

These four main conceptual contributions have led to a sophisticated field of academic endeavour in the field of human environment studies which, specifically for education, has led to an evolution of methods used to explore and interpret schools and classrooms. Begun by Herbert Walberg in the United States, educational environments became an area of extensive research into the way in which they cultivate positive or negative attitudes towards learning (Section 2.5.2), the way that students and teachers perceive them (Section 2.5.3), and for the way in which cognitive learning outcomes are concomitants of the environment (Section 2.5.5). A variety of studies involving single and multiple variables, and involving different aspects of school and classroom environment, have been attempted to explore, understand, interpret, modify and improve learning environments (Section 2.5.4).

There are three main ways in which classroom learning environments can be approached and researched:

- Observation and systematic classification, which employs a category scoring scheme that records the frequency of behaviour, events and activities for which interpretation can be made.
- Qualitative description of classroom activities, which offers descriptions of activities that relate to the class as a whole or individuals within the class.
- Participant perceptions of the psychosocial characteristics of the classroom.

The first two of these methods rely on 'objective' observation of someone external to the classroom who is able to itemise, record and describe the events that take place. Rosenshine (1970) referred to direct observations as *low inference* measures as the meaning and interpretation that can be drawn from such methodology is bound up in the understanding brought to the task by the observer. Conversely, by measuring participant perspectives of psychosocial aspects of the environment, Rosenshine (1970) articulated the concept of *high inference* measures which, according to Fraser (1986), can possess greater significance for participants for describing classroom events than *low inference* measures. Researchers (Steele, House & Kerins, 1971; Walberg & Haertel, 1980) utilised different inference measures to formulate instruments for classroom research and interpret data that was extracted from such investigations.

Over the past two decades, perceptual measures of the teaching and learning processes in the classroom have been regarded as having methodological advantages and have been employed widely to assess educational environments. For example, as perceptual measures of the environment are questionnaire-based, they are more efficient in extracting information than engaging in hours of classroom observation. In addition, observation is normally restricted to a selected number of lessons or learning situations, whereas perceptual measures relate to long-standing attitudes and perspectives held over many weeks or months. As perceptual measures involve the collective insights of all students, or a very large number of students in the class, the volume of information and degree of accuracy can be regarded as superior to a technique that only involves one observer. Importantly, because perceptions are the basis of human behaviour, perceptual measures offer a greater understanding of meaning than can be ascertained from observed behaviour (Chavez, 1984). Finally, responses to perceptual measures of classroom environments account for greater variance in student learning outcomes than directly observed behaviours.

Classroom environment research that employs high-inference measures for gathering data needs to account for the unit of analysis being undertaken. Stern, Stein and Bloom (1956) maintained that each person possesses a unique and individual perception of the environment (private beta press) which has the capacity to differ quite markedly from the common or shared perception (consensual beta press). Accordingly, the researcher can choose to monitor either the individual or the average class perceptions of the environment to provide private or consensual data press information, which could differ from each other and differ from the alpha press of the detached observer.

Intensive study in the 1970s and 1980s highlighted the importance of the unit of analysis in classroom research (Burstein, 1978; Burstein, Linn & Capell, 1978; Cronbach & Webb, 1975; Raudenbush, 1988). Fraser (1994) suggests a number of reasons why the unit of analysis in classroom environment research needs to be specified, some of which not only relate to the statistical implications of sampling and aggregation but, most importantly, to the validity of the interpretation of conceptualising different hypotheses. 'Between student analyses' involving questions about the individual's scores is quite different from 'between class analyses' which accounts for average environment perceptions within a class. Studies conducted in classroom environment research over the last 20 years have often differentiated between the individual and the class as the unit of analysis, resulting in independent statistical analyses and applications using the individual or the class (Fraser, Giddings & McRobbie, 1995). Similar distinctions have been made for the unit of analysis between the individual teacher's score and the school mean in studies involving the Work Environment Scale (WES) (Moos, 1981), thus reflecting the same concerns about statistical accuracy and inference that can be drawn from such research. The advantage of this distinction is that results not only account for differences between individuals and groups, but associations from one investigation can be cross-referenced against those of others which have utilised a common unit of analysis, be it the individual, class or school (McRobbie & Fraser, 1993; Waldrip & Wong, 1996).

While the theoretical principles associated with human environment studies were established nearly three quarters of a century ago, application to classroom environments in schools did not occur until Walberg and Anderson (1968) devised the LEI to evaluate the effectiveness of Harvard Project Physics. At the same time, Moos (1968) began developing his social climate scales which were applied to psychiatric hospitals (Moos & Houts, 1968) and correctional institutions (1968). Following early trials, the Classroom Environment Scale (CES) was developed (Trickett & Moos, 1974) and widely used to assess, interpret and modify learning environments. This pioneering work led to a profusion of new instruments (Fisher & Fraser, 1981; Fraser, 1981c; Fraser, Giddings & McRobbie, 1995, Fraser & Treagust, 1986; Taylor, Dawson & Fraser, 1995) that gave birth to a novel and thriving field of educational research. This endeavour was supplemented by a wide variety of literature reviews (Anderson, 1982; Anderson & Walberg, 1974; Fraser, 1989, 1994, 1998; Fraser & Walberg, 1991; Moos, 1979; Walberg, 1979), as well as an array of monographs (Fisher 1993, 1994; Fraser & Fisher, 1983a) and journals (McRobbie & Ellett, 1997; Fraser, 1998).

These developments have produced considerable progress in conceptualising, investigating and interpreting the concept of learning environments. Significant achievements over the last 30 years include:

- The complementary use of qualitative methods in learning environment research (Aldridge & Fraser, 1997; Aldridge, Huang & Fraser, 1998; Dorman, Fraser & McRobbie, 1995; Tobin & Fraser, 1998; Tobin, Kahle & Fraser, 1990).
- The distinction between, and development of, the preferred forms of questionnaires which differentiate between actual and ideal learning environments (Fisher & Fraser, 1983a).
- The development of short forms of the ICEQ, MCI and CES to provide greater economy in testing time and to allow hand scoring (Fraser, 1982a; Fraser & Fisher, 1983b).

- The use of feedback for actual and preferred forms to guide attempts to modify classroom environments (Fraser & Fisher, 1986).
- Person-environment fit studies of whether cognitive and affective learning outcomes are enhanced in preferred classroom environments (Fraser & Fisher, 1983c, 1983d).
- Cross-cultural studies of learning environments in different countries (Aldridge, Fraser, Taylor & Chen, 2000; Aldridge, Huang & Fraser, 1998; Aldridge, Fraser & Huang, 1999).

In recent years, the versatility of classroom environment instruments has been indicated by the considerable interest and use of classroom environment research in Asia (Aldridge & Fraser, in press; Aldridge, Fraser & Huang, 1999; Aldridge, Huang & Fraser, 1998; Chan & Watkins, 1994; Chionh & Fraser, 1998; Fraser & Chionh, 2000; Riah, 1998; Teh & Fraser, 1995, 1997; Waldrip & Wong, 1996.). The many and varied developments in a relatively short space of time are indicative of the research potential of the field of classroom environment studies and their capacity to inform educators of the salient features of classrooms, the learning process, cognitive learning outcomes, curriculum innovations and relational dynamics at the classroom level.

2.3 Classroom Environment Instruments

A wide variety of classroom environment instruments has been developed since the seminal research into the field undertaken by Walberg (1968). The instruments have incorporated scales that are designed to measure certain aspects of the environment, depending upon the hypothesis of the researcher and the field of investigation being undertaken. In the main, the early instruments were aimed at measuring psychosocial features of classrooms, including the Learning Environment Inventory (LEI), the Classroom Environment Scale (CES), the My Class Inventory (MCI) and the College and University Classroom Environment Inventory (CUCEI). As the field of research

advanced, a number of specific-purpose instruments were developed, including the Science Laboratory Environment Inventory (SLEI), the Constructivist Learning Environment Survey (CLES), the Work Environment Scale (WES), and the Individualised Classroom Environment Questionnaire (ICEQ). These instruments have been used extensively and have proven to be valid indicators of psychosocial features of classroom environments (Section 2.1).

The *Learning Environment Inventory* (LEI) was developed in the late 1960s in conjunction with an evaluation of the Harvard Project Physics curriculum (Walberg & Anderson, 1968). It was used extensively to investigate associations between school classes, classroom expectations and classroom climate for the way in which they affected student learning outcomes (Walberg, 1969b, 1969c). The final version of the LEI contains 105 statements, incorporating 15 scales with seven items per scale that describe typical school classes. There are four response alternatives for the LEI, namely — Strongly Agree, Agree, Disagree, Strongly Disagree.

The *Classroom Environment Scale* (CES), developed by Rudolf Moos (Moos, 1978; Moos & Trickett, 1974, 1987) at Stanford University, grew out of comprehensive research into human environments and social settings (Moos, 1974). Much of the initial research was conducted in prisons, hospitals and university residences. The CES originally contained 242 items with 13 scales which, after much field testing and refinement, was reduced to 10 scales each containing nine items. Responses to the 90 items on the CES are registered as either True or False.

The *Individualised Classroom Environment Questionnaire* (ICEQ) was developed in response to literature and academic discourse associated with open or inquiry approaches to learning. It aimed to assess those dimensions which differentiate individualised classrooms and conventional classrooms (Rentoul & Fraser, 1979). The development of the ICEQ was strongly influenced by consultations with teachers and secondary school students, with modifications to draft versions being based upon

further consultations. The final version of the ICEQ (Fraser, 1990) contains five scales with 10 items in each scale. Each item has the five alternative responses of Almost Never, Seldom, Sometimes, Often and Very Often. While the purpose of the ICEQ was to measure distinctive dimensions of individualisation in the classroom environment, it has also been used in conjunction with the LEI and CES in studies which focus on general aspects of classroom environment (Fraser & Fisher, 1982a).

To undertake research on classroom environments for children between eight to 12 years of age, the LEI was simplified to form the *My Class Inventory* (MCI) (Fisher & Fraser, 1981; Fraser & Fisher, 1982c; Fraser & O'Brien, 1985). The MCI has a lower reading level than the LEI and contains only five scales instead of the original 15. These differences enhance the readability of the MCI and reduce the demands on younger students undertaking the questionnaire. While the instrument was primarily developed for students in primary school, it has been used at the lower secondary level as well. The final form of the MCI requires students to answer on the questionnaire itself rather than an individual response sheet, which avoids errors in transferring responses from the questionnaire to a separate answer sheet. In addition, the four-point response format from the LEI has been reduced to a two-point (Yes-No) response format.

While considerable research had been undertaken in classroom environments in schools by the middle 1980s, little had been carried out in tertiary education. Accordingly, the *College and University Classroom Environment Inventory* (CUCEI) was developed for assessing the learning environment of small groups or classes of students of up to approximately 30 in colleges and universities (Fraser & Treagust, 1986; Fraser, Treagust, Williamson & Tobin, 1987). The final form of the CUCEI has seven scales containing seven items in each scale, aggregating to 49 items in total. Each item has the four Likert-type responses of Strongly Agree, Agree, Disagree and Strongly Disagree.

The *Questionnaire on Teacher Interaction* (QTI) was developed in the Netherlands and aims to assess the quality of interpersonal relationships between teachers and students (Creton, Hermans & Wubbels, 1990; Wubbels, Brekelmans & Hooymayers, 1991; Wubbels, Creton & Hooymayers, 1985). Unlike other classroom environment instruments, the QTI is based on a different theoretical model involving a proximity dimension (Cooperation/Opposition) and an influence dimension (Dominance/ Submission) to assess the relational state of the environment. The original version of the QTI contained 77 items that measured eight behavioural scales that were scored on a five-point response rating scale ranging from Never to Always. A shortened version of the questionnaire was devised (Wubbels, 1993) with 48 items equally shared between the eight scales. The QTI has been used extensively in recent years in Australia (Fisher, Henderson & Fraser, 1995), Singapore (Goh, Young & Fraser, 1995) and Brunei (Riah, 1998).

A modified version of the QTI has formed the basis of the *Principal Interaction Questionnaire* (PIQ) which utilised the same eight dimensions to assess the quality of interpersonal relations between teachers and principals in schools (Cresswell & Fisher, 1996, 2000).

Recently, the *What Is Happening in This Class* (WIHIC) questionnaire combined existing scales from a range of instruments with additional scales that address contemporary educational issues such as equity and constructivism. Developed by Fraser, Fisher & McRobbie (1996), the original 90-item version was reduced as a result of extensive field testing and statistical analysis to an eight-scale instrument with 10 items in each scale. The scales incorporated into the final seven-scale version of the WIHIC are Student Cohesiveness, Teacher Support, Involvement, Investigation, Task Orientation, Cooperation and Equity. Considerable use of this instrument in assessing classroom environments on a cross-cultural basis has occurred over recent years through studies involving Taiwan, Brunei and Singapore (Aldridge, Huang & Fraser, 1998; Chionh & Fraser, 1998; Riah, 1998; Riah & Fraser, 1998).

2.3.1 Specific-Purpose Instruments

The *Science Laboratory Environment Inventory* (SLEI) was developed with the specific aim of assessing laboratory classroom environments at the senior secondary or tertiary education levels (Fraser, Giddings & McRobbie, 1993, 1995; Fraser, McRobbie & Giddings, 1993). Because science educators were keen to know more about the unique environments of laboratories in the teaching of science, this specific-purpose instrument was devised to elicit student perceptions of the learning in laboratory classrooms. The instrument contains five scales with seven items in each, incorporating the response alternatives of Almost Never, Seldom, Sometimes, Often and Very Often. The SLEI, like the QTI and other more recently developed instruments (such as the WIHIC discussed below), has been field tested extensively and cross validated in different countries (Fraser & McRobbie, 1995) including Singapore (Wong & Fraser, 1995, 1996).

The *Constructivist Learning Environment Survey* (CLES) is another specific-purpose instrument developed to assess the degree of constructivism (a process which views learning as a cognitive and experiential interaction between the world and the individual's existing knowledge and active negotiation and consensus building that exists in classrooms) (Taylor, Dawson & Fraser, 1995; Taylor, Fraser & Fisher, 1997; Taylor, Fraser & White, 1994). The CLES was aimed to assist teachers and students assess the degree to which the classroom environment is consistent with constructivist epistemology and to enable teachers to calibrate their teaching practice to align more closely with principles of constructivism. Recently, an insightful study of constructivist learning environments was undertaken using the CLES in Korea, to investigate the extent to which a new general science curriculum reflected constructivist principles of teaching and learning (Kim, Fisher & Fraser, 1999). The CLES comprises 35 items with five scales and seven items in each scale. Each item has a five-point response scale consisting of Almost Always, Often, Sometimes, Seldom and Almost Never.

The instruments outlined above, plus a variety of others devised to measure particular aspects of classroom environments, have resulted in a range of applications to deepen understanding of contemporary learning environments. For example, the *Distance and Open Learning Environment Scale* (DOLES) was developed to assess the nature of the learning environment encountered in university-level distance education (Jegede, Fraser & Fisher, 1995). The DOLES contains seven scales, five of which are common (Student Cohesiveness, Teacher Support, Personal Involvement and Flexibility, Task Orientation and Material Environment, and Home Environment) and two of which are optional (Study Centre Environment and Information Technology Resources).

The *Cultural Learning Environment Questionnaire* (CLEQ) (Fisher & Waldrip, 1997) was developed to assess the impact of cultural sensitivity on learning. The 40-item CLEQ drew on scales from previous research (Equity, Competition), but also included novel scales (Modelling, Congruence and Communication) to elicit information about the influence of culture on the learning environment.

An amalgam of the LEI, ICEQ and SLEI was developed and entitled the *Computer Classroom Environment Inventory* (CCEI) to evaluate computer-assisted learning environments (Maor & Fraser, 1996). Scales adopted from the CLES and ICEQ were used to develop the first classroom environment study in agricultural classes on a worldwide basis (Idiris & Fraser, 1997), and these were field tested in Nigeria. These many developments that draw on new applications of existing research, as well as the genesis of new scales and questionnaires, are testament to the versatility, sensitivity and parsimony associated with the instruments themselves and the dimensions of psychosocial environments that they assess.

In summary, a variety of instruments incorporating a range of uses has seen a comprehensive field of research conducted over recent years aimed at further understanding of the nature and impact of learning environments. New instruments

(Goh & Tobin, 1999) have been complemented by important refinements to classroom environment research, which forms the basis of literature reviewing in the next section of discussion.

2.4 Important Developments in Conceptualising and Applying Learning Environment Instruments

New conceptualisations and developments have led to an increasing sophistication of measurement and understanding of environment dimensions in recent times, and have found expression in a variety of classroom environment instruments. This section discusses and codifies some of the important developments that are now widely used to elicit more precise information about perceptions of human environment, including Actual and Preferred Forms (Section 2.4.1), Short Forms for expedient assessment of classroom environments (Section.2.4.2) and Personal vs Class Forms which have the potential to differentiate between different units of analyses (Section 2.4.3).

2.4.1 Actual and Preferred Forms

In the early stages of classroom environment research, instruments were developed to assess the perceptions of the actual environment that was being experienced by the participants. By altering the wording of the LEI and the MCI, Fraser and Deer (1983), Fraser and Fisher (1983b) and Fraser and O'Brien (1985) devised preferred variations of the instruments, which aimed to elicit perceptions of preferred or ideal classrooms. While both versions contain similar wording, the actual form asks students to respond to what they feel about their classroom, while the preferred form asks students to indicate what they perceive to be ideal goals and orientations in the classroom. In such a way, research can establish the degree to which students perceive that their existing classroom environments are congruent with ideal environments, how environments can be modified to respond more closely to preferred environments, and to research

whether student learning outcomes are maximised in preferred or ideal learning environments. Since the genesis of preferred forms, many of the instruments for assessing classroom environment have developed preferred versions of the questionnaire. All learning environment instruments outlined in Table 2.1 have preferred forms.

2.4.2 Short Forms

Because of the insights provided by early classroom environment studies, researchers and teachers saw a need for forms that could be quickly administered in classrooms to assess student perceptions of the environment. Short forms of the ICEQ, MCI and the CES were developed (Fraser, 1982a; Fraser & Fisher, 1983b, 1986) to provide efficient and reliable methods to assess the quality of classroom environments. Key issues were identified in developing the shortened versions of the instruments:

- The total number of items had to be reduced to allow for efficiency of administration and economy of time in scoring. Accordingly, the ICEQ, MCI and CES, which contained 50, 38 and 90 items, respectively, in the long versions, were reduced to 25, 25 and 24 items, respectively.
- The forms enabled hand scoring to allow for quick return of data and interpretation of the environment.
- The effectiveness of the form would lie in using the class mean as the unit of analysis rather than the individual student.

Despite the brevity and simplicity of the forms, they have demonstrated adequate reliability at the class level to inform teachers and researchers about salient aspects of the classroom environment (Fraser & Deer, 1983). The development of the shortened versions of the questionnaires has made classroom environment instruments available

and useable to teachers who wished to assess and improve their own classroom environments.

More recent questionnaires such as the SLEI, CLES and WIHIC have not been developed with separate long and short forms. Rather, they have seven to eight items per form to accommodate the need for depth of information as well as efficiency for quick and practical use. The 'medium-size' form was the method adopted in this study with the Middle School Classroom Environment Indicator (MSCEI), which has capitalised on past research and produced a form which has the capacity for efficient and practical use in classrooms at the upper primary and lower secondary levels.

2.4.3 Personal vs Class Forms

Responsive to Stern, Stein and Bloom's (1956) conceptualisation of *private* beta press, which is the individual view that a person has of the environment, as distinct from *consensual* beta press which is the shared perception of the environment held by the group, Fraser, Gidding and McRobbie (1995) developed a *personal* form to measure an individual's perceptions of his or her own role within the class. The *class* form measures an individual's perceptions of the class as a whole. Therefore, the personal form offers a distinct and unique perception of the environment as it singularly relates to the individual, whereas the class form assesses an individual's view of the way that the environment impacts on the class as an aggregated unit. To elicit this information, the wording of the form needs to be precise and explicit. For example, in the personal form, an item would be worded "I find the work in this class difficult", whereas the class form would be written as "The work of the class is difficult".

When field testing and validating actual and preferred versions of the SLEI on a personal and class level, Fraser, Giddings and McRobbie (1995) found that students

have a more objective and detached view of the environment as it relates to the class as a whole, as distinct from their own individual views.

Because the personal form has the capacity to differentiate personal perceptions from the aggregated class perceptions of the environment, it has a greater capacity to measure and be responsive to subgroups and sub-environments within the classroom (e.g. target students, gender groups, individual students, groups, etc.).

Because the present study wished to research individual rather than class perceptions of the environment, the wording was constructed to allow for personal views of the class in each questionnaire item. This was specifically undertaken to elicit information pertinent to individual perceptions of the classroom for separate analysis, so that aggregated profiles could determine more acutely the perceptions of classroom environments in Grade 7 and Grade 8, respectively. This is an important feature of this study, as it not only allows for comparisons and contrasts between primary and secondary classrooms across transition, but also allows for cross-referencing of individual views of classrooms between subjects (English and Mathematics) at Grade 8 (see Section 4.4).

2.5 Use of Classroom Environment Instruments in Past Research

This section provides an overview of the use of classroom environment instruments in past research. Because of the diverse range of instruments that have been devised, the scope of research over the last two decades has been extensive. This section discusses the use of classroom environment assessments in the evaluation of curriculum innovations (Section 2.5.1), research into the relationship between classroom environments and learning outcomes (Section 2.5.2), research into differences between students' and teachers' perceptions of actual and preferred environments (Section 2.5.3), practical attempts to improve classroom environments (Section 2.5.4), research

into whether students achieve better in their preferred environments (Section 2.5.5), studies involving the use of multiple classroom environment instruments in the one study (Section 2.5.6), research into school-level environment (Section 2.5.7), international and cross-national studies that have been undertaken (Section 2.5.8), the use of classroom environment ideas in teacher education (Section 2.5.9), studies of determinants of classroom environment (Section 2.5.10), using qualitative data to augment quantitative classroom environment assessments (Section 2.5.11), and classroom environment studies with the teacher as active participant and researcher (Section 2.5.12).

2.5.1 Evaluation of Curriculum Initiatives

Evaluation of curriculum initiatives was one of the earliest uses to which classroom environment assessments were applied. The Learning Environment Inventory (LEI), developed by Walberg and Anderson (1968), was used to evaluate Harvard Project Physics, to see whether the original objectives behind the curriculum were achieved at the classroom level (Walberg & Welch, 1972). Findings of the study involving a sample of 3,264 students and 75 teachers indicated that the curriculum, which was designed to provide greater practical laboratory work and student-centred learning, promoted classroom environments which were perceived to be more democratic and having less friction. Walberg concluded that distinctive learning environments were associated with the Harvard Project Physics curriculum, with classrooms characterised by presenting greater cohesiveness and more positive cognitive and affective learning outcomes. This study spawned a field of research in which curriculum innovations, were evaluated using classroom environment dimensions as criterion variables (Creton, Hermans & Wubbels, 1990; Fraser, 1976b; Fraser & Welch, 1992; Raviv, Raviv & Reisel, 1990).

A similar process of curriculum evaluation using classroom environment assessments was undertaken by Fraser (1976b), when investigating the impact of the Australian Science Education Project (ASEP) at the classroom level. This was a self-paced, inquiry-based approach to the study of science as distinct from the teacher-centred model that was in use at the time. Using a classroom environment questionnaire designed for the study, Fraser sampled 541 students to conclude that there was greater individual learning and personal autonomy associated with the new curriculum, and that there was a higher degree of satisfaction for students using the ASEP materials relative to those students who were not. This research was challenged by Northfield (1976), who reported an overall increase in classroom Individuality and Goal Directedness, but a decrease in Satisfaction, in ASEP classes. Northfield (1976) also investigated ASEP's impact on the learning environment and how alternative modes of presentation altered student perceptions of the classroom. Using the Classroom Activities Questionnaire (CAQ), Tisher and Power (1978) concluded that, whereas higher achieving students found the classroom more challenging and superior using the ASEP curriculum, students of average or below average ability encountered problems with it. These complementary strands of research demonstrated the sensitivity of classroom environment instruments to assess the impact of curriculum initiatives, with particular reference to how they affect the psychosocial perceptions of the classroom environment.

More recent research conducted by Brekelmans, Wubbels and Creton (1990) and Creton, Hermans and Wubbels (1990) aimed to investigate the impact of the PLON Physics curriculum in Holland. Using a sample of 21 teachers and over 1,000 students across 65 classrooms, these studies concluded that, while the curriculum impacted on the quality of student learning outcomes and the classroom environment, it did so minimally compared to the quality of interpersonal relationships established by the teacher. Wierstra (1984) also assessed the impact of the PLON curriculum for the way that it affected cognitive and affective learning outcomes for students and for the way it influenced perceptions of the classroom environment.

Raviv, Raviv and Reisel (1990) used classroom environment dimensions to evaluate a curriculum innovation which focussed on individual learning. Using the Classroom Environment Scale (CES) and more fine-grain research methods involving two high schools, the study revealed that different classroom environments had indeed been established. Teachers and students in the experimental school that emphasised individual learning perceived their environment as being more supportive, involved and innovative, whereas teachers and students in the conventional environment perceived less favourable classroom environment in terms of greater task orientation, anticipation and teacher control.

The perceptions of 120 students and seven teachers were used in a study conducted by Maor and Fraser (1996) to investigate the use of a computerised database which was designed to promote inquiry learning skills. The Computer Classroom Environment Inventory (CCEI) was developed to assess students' changing perceptions of their learning environment as they engaged in computer-assisted learning. Findings associated with this study revealed substantial effect size differences and statistically significant differences in *t* tests for paired samples for the scales of Investigation and Open-endedness, for the perceptions of both teachers and students involved in the study. These results indicate that the curriculum materials promoted greater inquiry-centred learning over the course of the research, with students' perceptions attesting to a more open-ended and investigative learning environment.

Another curriculum innovation that has been the object of classroom environment research is the PROLOG-based computer assisted learning (CAL), which is courseware used in computer-assisted learning (Teh & Fraser, 1994). The main purpose of the study was to evaluate an initiative in the use of computers by measuring changing perceptions of the learning environment, using effect size calculations for student achievement and student attitude. Six hundred and seventy one students in 24 classes (348 in the experimental group and 323 in the control group) formed the sample for the

investigation, which utilised a new instrument entitled the Geography Classroom Environment Inventory (GCEI). The findings from this study are both interesting and instructive. Relative to control classes, the CAL classes were perceived to have greater Gender equity, Investigation, Innovation and Resource adequacy, because CAL courseware offered students more opportunity to pursue investigations than the traditional teacher-centred instructional approach. This investigation suggests that appropriately-designed software such as PROLOG-based CAL can be an effective instructional method above and beyond traditional methods of teaching and learning, and that it can substantially alter student perceptions of their learning environment.

While these represent major studies that have been undertaken to assess the impact of educational innovations on the quality of the learning environment, several other studies have been mounted to assess the impact of curriculum materials in the United States (Allen, 1973; Jones, 1977; Lowrey, Bowyer & Padilla, 1980; Mann, 1972; Starr, 1980; Welch & Walberg, 1972), Israel (Novik & Duvdvani, 1976) and Korea (Kim, Fisher & Fraser, 1999). In some cases (Robinson, 1980), responses to curriculum packages were perceived to create more favourable classroom environments, whereas other studies suggest that the impact of curriculum materials has been less in terms of influencing classroom environment.

This body of research indicates that there has been considerable interest in the use of classroom environment variables to investigate the impact of curriculum innovations. The number of studies, the variety of instruments and the array of influences that have been investigated over the last three decades indicate that classroom environment dimensions provide a useful source of information for the effective evaluation of curriculum emphases and innovations. Studies such as these inform researchers, teachers and educational administrators about the impact of curriculum in teaching and learning in the classroom and the way in which it affects perceptions of the environment.

2.5.2 Associations Between Classroom Learning Environments and Student Outcomes

Extensive research has been conducted into the association between perceptions of classroom environments and student learning outcomes (Fraser, 1982a, 1982b, 1997; Fraser & Fisher, 1982a, 1982b). Table 2.2 contains a cross section of studies over the last 30 years into associations between student outcomes and classroom environment. Each instrument and its application attest to the versatility of the research as well as the way in which learning outcomes are associated with perceptions of classroom environment. The range of studies conducted throughout Canada, Australia, the United States, and most recently, Asia (see Chionh & Fraser, 1998) demonstrate the capacity of classroom environment instruments to link outcome measures with the environment. Samples of students range from 285 to over 6,000, which is further indication of the capacity of the instruments to identify outcome measures associated with the different types of learning environments (see Table 2.2).

Classroom environment research has focussed on variance in cognitive and affective learning outcomes accounted for by class environment beyond that attributable to background student characteristics (Fraser, 1984). The studies indicate that appreciable proportions of the variance in student outcomes are associated with dimensions of the classroom environment, with the practical implications being that student learning can be enhanced by altering specific aspects of the environment.

Table 2.2
A Sample of Studies of Associations Between Student Outcomes and Classroom Environment

Study	Outcome Measures	Sample
Learning Environment Inventory		
Anderson & Walberg (1968)	Achievement, understanding, nature of science, science processes, participation in physics classes	Various samples of senior high school students in the United States and Canada
Walberg & Anderson (1972)	Examination results	1600 Grade 10 and 11 students in various subject areas
Fraser (1978, 1979)	Inquiry skills, attitudes, understanding of the nature of science	531 students in Grade 7 science classes in Australia
Classroom Environment Scale		
Trickett & Moos (1974)	Satisfaction and mood criteria	608 students in the United States
Moos & Moos (1978)	Absences, grades	19 high school classes in one school in the United States
Fisher & Fraser (1983b)	Inquiry skills, attitudes	116 Grade 8 and 9 science classes in Tasmania
Individualised Classroom Environment Questionnaire		
Rentoul & Fraser (1980)	Inquiry skill, enjoyment	285 junior high school students in social science classes in Sydney
Fraser (1981c); Fraser & Butts (1982)	Attitudes	Maximum of 712 students in 30 junior high school science classes in Sydney
Fraser & Fisher (1983b)	Inquiry skills, attitudes	116 grade 8 and 9 science classes in Tasmania
My Class Inventory		
Fraser & Fisher (1982a, 1982c)	Inquiry skills, understanding of nature of science, attitudes	2305 Grade 7 science students in Tasmania
Payne et al. (1974-75)	Achievement, school attendance	6151 Grade 4 students in 89 schools in the United States
Science Laboratory Environment Inventory		
Fraser & McRobbie (1995)	Attitudes	2330 students in 65 classes in senior high school
What Is Happening In This Class		
Chionh & Fraser (1998)	Student achievement, self-esteem, attitude	2310 Singaporean students
Aldridge & Fraser (1997)	Socio-cultural attitudes	1081 Australian students 1879 Taiwanese students

Adapted from Fraser (1994)

Research conducted by Rentoul and Fraser (1980) involving administration of the ICEQ to 285 students in 15 classes revealed that attitudinal outcomes and inquiry skills were significantly related to classroom environment dimensions. This preliminary study was supported by further research involving 320 students using the ICEQ that identified an association between the level of classroom individualisation in junior high school science classes in Australia and positive attitudinal outcomes (Fraser, 1981c; Fraser & Butts, 1982).

A more comprehensive longitudinal study conducted in Tasmania involving the ICEQ investigated learning environment outcomes in 116 Grade 8 and Grade 9 primary science classes (Fisher & Fraser, 1982a). The pretest was administered near the beginning of the year and involved three cognitive and six affective measures and a posttest of these measures was administered at the end of the year. The outcomes of this research, which was subjected to considerable statistical interrogation, revealed that classrooms that had higher rates of participation were linked with had higher levels of student interest in science, and classes that were perceived as having higher levels of investigation promoted a greater capacity in students at drawing conclusions and generalisations.

Relationships between classroom environment dimensions and student learning outcomes have also been investigated in science laboratories. Using the SLEI with a sample of 2,330 students in 65 classes in Australia, Fraser and McRobbie (1995) investigated the nature of science laboratories and student outcomes. The study revealed that positive student attitudinal outcomes were consistently apparent in classroom environments where Student Cohesiveness, Integration, Rule Clarity and Material Environment were perceived as favourable. This research is supported by other studies undertaken in Australia (Henderson, Fisher & Fraser, 1994, 1995; McRobbie & Fraser, 1993) and England (Fraser & Wilkinson, 1993).

Slavin's research synthesis (1983) indicated that cooperation, under certain conditions, is likely to lead to higher cognitive achievement when group research and individual accountability are operative. Slavin's discerning research, which synthesised 46 studies conducted in elementary and secondary schools, aimed to measure the impact of cooperative learning modalities on classroom learning environment. This detailed and useful study challenged the efficacy of cooperative learning per se, indicating that positive student learning outcomes were provided only in certain circumstances. Individual accountability was found to increase student achievement along with group rewards such as teacher praise, improved marks, etc. Better affective outcomes in the form of self-esteem, acceptance of others and better race relations were also achieved in 63% of the studies analysed. Slavin's erudite research clearly established a link between cooperative learning and student learning outcomes when motivation and individual accountability were conditioned by the teacher.

An innovative approach towards student learning environments was undertaken through the development and application of the QTI (Brekelmans, Wubbels & Creton, 1990; Wubbels, Brekelmans & Hooymayers, 1991; Wubbels, Creton, & Hooymayers, 1992) which aimed to explore the quality of relationships between student and teacher, and the degree to which they impacted on student outcomes. In a study conducted in the Netherlands involving 66 Grade 9 physics classes responding to the QTI and a 23-item standardised test on physics subject matter, it was found that students' perceptions of interpersonal teacher behaviour accounted for significant variance in outcomes between classes of the same ability level. It led researchers to assume that interpersonal teacher behaviour is not only an important factor related to student outcomes, but teachers' interpersonal behaviours influence student outcomes more than the use of different curricula, teachers' ages, or the amount of teaching experience.

Furthermore, the research indicated that, when teachers exhibited interpersonal behaviour from the Cooperative scales involving Student Responsibility and Freedom Behaviour, Understanding Behaviour, Friendly Behaviour, or Leadership Behaviour,

students developed more positive attitudes towards the subject. Achievement outcomes were associated most closely with the three Dominance scales of the model. Teachers' Strict Behaviour, Leadership Behaviour and Friendly Behaviour were correlated positively to student achievement, whereas the Submission scales involving student Responsibility Behaviour, Uncertain Behaviour and Dissatisfied Behaviour impacted negatively on achievement. Wubbels' research pointed towards two distinct conclusions:

- Teachers who exhibit dominant behaviours such as Strict, Leadership, Helpful/Friendly and Understanding behaviours tend to promote cognitive outcomes, while teachers who demonstrate Student Responsibility enhance students' affective outcomes.
- The findings to a large extent support the earlier work undertaken by Haertel, Walberg and Haertel (1980), who found that student achievement is heightened in classrooms that are perceived by students as having greater cohesiveness, satisfaction and goal directedness, with less disorganisation and friction.

In light of these findings, Wubbels purported that new curriculum materials that had been the object of previous research, including the Harvard Project Physics, ASEP and PLON, were likely to yield appreciable learning outcomes if accompanied by changes in teacher behaviour.

In recent times, student learning outcomes associated with classroom environment research has led to a number of studies being conducted in Asia (Asghar & Fraser, 1995; Chionh & Fraser, 1998; Goh, Young & Fraser, 1995; Riah, 1998; Riah & Fraser, 1998; Wong & Fraser, 1994, 1995). This research further establishes support for the association between psychosocial perceptions of the classroom environment and the impact on student learning outcomes. Of particular interest was Fraser and Chionh's (2000) study conducted in Singapore, which had an impressive sample size of 2,310

Singaporean students and assessed student perceptions of the environment for Mathematics and Geography classes. This study utilised the What Is Happening In This Class (WIHIC) questionnaire, and identified strong associations between high achievement in examination scores in classrooms that were perceived as having more Student Cohesiveness, whereas self-esteem and attitudes were favourable in classrooms perceived as having more Teacher Support, Task Orientation, and Equity.

Research by Aldridge and Fraser (1997) has provided considerable insight into cultural differences and the way that they affect perceptions of classroom environments. Using the What Is Happening In This Class (WIHIC) Form, a relatively large sample of 1,879 students from Taiwan and 1,081 students from Australia provided information about their perceptions of classroom environment in high school science classes. These perceptions were conditioned by prevailing socio-cultural influences of Taiwan and Australia, respectively, and indicate that:

- Cultural determinants have a large impact on student perceptions of the classroom environment.
- Students have different levels of respect for teachers and varied perceptions about what constitutes good teaching practice in Taiwan and Australia, respectively.
- Cultural influences can be a powerful determinant of student motivation to learn.
- Distinct differences exist between perceptions of ideal classroom environments in Taiwan and Australia, respectively.

The other important aspect of this study was the extensive use of qualitative data elicited through student interviews, which was used to support and interpret quantitative data procured through the application of the WIHIC (Aldridge & Fraser, in press).

The many studies involving different instruments (LEI, CES, ICEQ, MCI, SLEI, QTI), in a range of countries (United States, Australia, Canada, Netherlands, Singapore,

Brunei, Taiwan, Korea) and involving students in primary school, secondary school and universities (Fraser, Treagust, Williamson & Tobin, 1987), provide a rich source of information to educators and administrators about the relationship between classroom environment dimensions and student learning outcomes. In addition, this research offers guidance for how classroom environments might be improved in order to engender superior cognitive and affective learning, while, at the same time, recognising that caution is needed because the correlational nature of such studies cannot be sure about cause.

One purpose of the current study using the MSCEI was to measure associations between classroom environment and student attitudes in upper primary and lower secondary respectively. Using scales such as Autonomy, Affiliation, Teacher Support, Involvement and others that are regarded as key indicators of adolescent learning (Eyers, Cormack & Barratt, 1993; Cormack, 1996b; Cumming, 1996a, 1996b; Hargreaves & Earl, 1990), the MSCEI was constructed to elicit perceptions of the classroom held by students as they move between the more stable and secure environments of primary school to the more dynamic and changeable classrooms of secondary school.

2.5.3 Actual and Preferred Classroom Environments

The use of actual and preferred forms of educational environment instruments enables an understanding of the differences between students' and teachers' perceptions of the same environment to be established. Past studies (Fisher & Fraser, 1983a; Fraser, 1984; Raviv, Raviv & Reisel, 1990) generally indicate that teachers have a more positive perception of the actual classroom environment than students. Compared to the actual environment of the classroom, students and teachers typically prefer a more positive environment than the one that apparently exists. Using the ICEQ with a sample of 116 classes and 56 teachers, Fisher and Fraser (1983a) established significant

differences between students' and teachers' perceptions of the classroom. For each of the ICEQ's five scales — Participation, Independence, Investigation, Personalisation and Differentiation — students preferred a more positive environment than what was present. In addition, apart from the Independence scale, teachers perceived a more favourable environment on each of the other four scales than did students.

A similar study using the MCI was undertaken by Fraser (1984) to investigate the perceived differences in actual and preferred environments in primary schools. The results of this research reflect those of the previous investigations, indicating that students preferred higher levels of Cohesiveness and Satisfaction with Less Friction and Competitiveness than what was present. Teachers also preferred greater Cohesiveness and Satisfaction with Less Friction and Competitiveness and Difficulty. When teachers' perceptions of the actual environment were compared to students' perceptions, teachers reported more favourable perceptions in terms of greater Satisfaction and less Competitiveness and Friction.

When researching the quality of teacher interpersonal behaviours at the classroom level, Wubbels, Brekelmans and Hooymayers (1991) reported that teachers had a more favourable view of their own behaviours than did their students. Teachers perceived that higher levels of Leadership, Helpful/Friendly and Understanding Behaviour were exhibited than those perceived by the students in the same classes. Both students and teachers commonly perceived that actual behaviours fell short of ideal interpersonal behaviours, indicating that, while using different indices, consistent patterns across various actual and preferred classroom environments were established.

In researching the difference between actual and ideal environments in science laboratories, Hofstein, Cohen and Lazarowitz (1996) adapted actual and preferred versions of the SLEI. Their findings were consistent with the research undertaken in conventional classrooms, with students indicating that there were shortfalls between the actual environment that they experience and their ideal science laboratory environment.

In particular, students believed that their actual environment was insufficiently cohesive, that experiments were too directed and lacked integration with the subject matter, and that greater clarity of rules and improvement in the material provision of the laboratory could be made. In each of these areas, the actual scores were below the preferred environment scores. In this study, both teachers and students had less positive perceptions of their actual laboratory environment than those which they ideally preferred.

Prevailing epistemologies and established cultural practices in non-Western countries, where the teacher has a more central and significant role in the learning process, have been the object of research into actual environments in classrooms. Studies undertaken in Hong Kong (Chan & Watkins, 1994), Brunei (Riah, 1998) and Nigeria (Idiris & Fraser, 1997) indicate that, while students generally have favourable views of their actual environments, there is a strong sense of teacher-centredness and competition. These studies, which have utilised different instruments and subtly different scales, indicate that classrooms in non-Western countries have environments different from those in Western countries; in non-Western countries, there are lower levels of Independence and Student Centredness and higher levels of Competition and Teacher Control. These cross-cultural studies represent interesting contrasts between classroom environments in different cultural settings and attest to the differences between ideal or preferred leaning environments given various cultural proclivities for learning. What might be regarded as a preferred learning environment in a non-Western context (i.e. strong teacher centredness and high competition), would be considered antithetical to the preferred classroom environment in a country such as Australia.

Tobin and Gallagher's research (1987a, 1987b) on 'target students' established that certain students demand greater attention from the teacher than other students in the class. Because some students are more actively involved in classroom interactions than their classmates, they subsequently experience and perceive different learning environments from other students in the same class. This study led to a belief that the

class mean, which was typically used as the unit of analysis in classroom environment research, camouflaged individual perceptions of the environment, ignoring the individual differences that were experienced on a day-to-day basis in classrooms. In effect, this research established that different actual environments can be experienced by different students, and that the disparity between actual and preferred environments is relative to the individual. Fraser and Tobin's (1991) investigation of target students using the CES revealed that target students perceived a different actual environment than non-target students, registering more Involvement and Rule Clarity than other students who were less engaged in classroom activities.

Studies in various schooling settings (primary and secondary), involving different research instruments and scales, in conventional classrooms and in specific-purpose learning environments (e.g. virtual classrooms for online learning), and using samples of students in Western countries and in Asia, indicate that teachers and students perceive different actual environments in the same classrooms. In most cases, teachers have a more favourable impression of the learning environment than students. The prevalence of high levels of Personalisation, Cohesiveness, Satisfaction and Understanding and Helpful Behaviours for the teachers has the net effect of drawing actual classrooms closer towards the preferred, prompting research into what constitutes exemplary teaching that can create environments conducive to learning and student satisfaction (Fraser, 1994). The conclusion drawn from this research is that information of this kind can assist teachers to understand the nature of their classroom environment and, through reflection and intervention, improve the quality of their environment.

The MSCEI used in my study aims to measure both the actual and preferred learning environments in upper primary and lower secondary classrooms. Of the two studies published studies in this area (Feldlaufer, Midgley & Eccles, 1988; Ferguson & Fraser, 1996, 1998), neither has reported on the preferred and actual variations of the instrument, although Ferguson's unpublished doctoral dissertation (Ferguson, 1998) did

employ actual and preferred forms. This methodology was specifically employed in this study to see if there is an increased disparity between perceptions of preferred and actual classroom environments for students as they move into secondary education.

2.5.4 Practical Attempts to Improve Classroom Environments

The formal tradition of teachers attempting to modify and improve their classroom environment is attributed to Lawrence Stenhouse (1967), who asked teachers to engage regularly in critical reflection and self-monitoring to make their teaching lively and engaging for students. Joseph Schwab (1969) formalised the importance of negotiation and discussion as key methods in responding favourably to what he perceived as the four central dimensions of educational endeavour, namely, the teacher, learner, curriculum and milieu. Each of these dimensions provides the daily dialectic in a classroom which conditions either favourable or unfavourable perceptions of the environment. While these approaches held open the possibility for changed and improved classroom environments, they utilised a paradigm that viewed the teacher as the key agent for assessment and change of classroom environment, rather than the lived reality of the students.

Fraser's early work (1981a, 1981b) deployed the conceptualisation that students were best placed to make the judgements about actual and preferred environments which provide the basis for effective and meaningful changes to the classroom environment. Through the application of the ICEQ, Fraser found that there was a demonstrable gap between actual and preferred environments in Personalisation, Participation, Independence, Investigation and Differentiation. If cognitive and affective student outcomes were to be enhanced, there would need to be appreciable changes to the classroom environment that would be perceived by the students.

The development of short forms of the ICEQ, MCI and CES (Fraser & Fisher, 1983b) is regarded as an important development in classroom environment research that allowed the application of efficient instruments to assess and to guide interventions aimed at improving the environment of the classroom based on the perceptions of the milieu inhabitants. Early studies using the short forms of MCI (Fraser & Deer, 1983) involving two samples of 758 students in Grade 3 in Sydney, and 2305 students in Grade 7 in Tasmania, revealed that there was a noticeable disparity between the actual and preferred environments of students in the class. By introducing strategies to improve perceptions of Satisfaction and Cohesiveness and decrease the amount of Friction in the classroom, teachers involved in the study avoided criticising students in front of the class and resorted to private admonishment where it was required. Later applications of the MCI in this study indicated greater Satisfaction, less Friction, less Competitiveness, less Difficulty and greater Cohesion as perceived by the students. While these intended outcomes were received positively, the researcher was quick to point out that educators must be aware of unintended outcomes from attempts to alter the environment; in this case, classwork became less difficult to a point where it was less challenging for a number of students.

While the qualitative findings associated with the use of this instrument with Grade 3 and Grade 7 classes were informative, it was also revealed that the teachers involved in the study found that it was a valuable exercise in professional development.

A fine-grain research method involving 22 students and the application of the short form of the CES by Fraser and Fisher (1986) was formalised into a five-step approach to assess, alter and then evaluate modification to classroom environments:

1. *Assessment* of all students involved via the actual and preferred versions of the questionnaire.

2. *Feedback* was given to the teacher about discrepancies between the actual and preferred environments of the classroom, with a view to the teacher considering aspects of change that would improve the quality of the environment by reducing this discrepancy.

3. *Reflection and discussion* was undertaken to decide which dimensions of the classroom environment needed to be altered. In the case of the study under review, a deliberate attempt was made to increase Teacher Support and Order and Organisation at the classroom level.

4. *Intervention* over a two-month period allowed students' perceptions of the classroom environment to be influenced by the interventions. In the case of Teacher Support, the teacher decided to move around the class more to talk with students and offer assistance where it was believed necessary.

5. *Reassessment of the classroom environment* involved the use of the actual form.

While the steps involved in this research present a framework for a classroom environment improvement strategy, the outcomes indicated sizeable perceptual improvements in the classroom environment dimensions of Teacher Support, Task Orientation, and Order and Organisation.

Attempts to improve the quality of the educational environment through teacher interventions have been undertaken in a variety of situations. An early study involving use of the Work Environment Scale (WES) (Fisher & Fraser, 1983b) with 114 science teachers in 35 secondary schools in Tasmania revealed significant improvement in the school environment following strategic intervention and attention. Fisher and Fraser's use of the long version of the SLEQ (1991), with a three-part research sample involving 19 co-educational government schools and 83 teachers in Sydney, 34 secondary school teachers in New South Wales and 109 teachers in primary and

secondary schools in Tasmania, revealed that the posttest assessment using the instrument revealed significant improvement in the classroom environment following strategic intervention and change by the teacher.

Indicative of the effectiveness and relative simplicity of these techniques for improving classroom environment and student learning outcomes, is a study that was undertaken in Britain by Thorp, Burden and Fraser (1994) with one class of 34 Grade 8 students. Using the ICEQ, the classroom environment revealed relatively large differences (seven to eight raw score points) between the actual and preferred scores for the dimensions of Personalisation, Participation, Independence and Investigation. The teacher was genuinely concerned to improve the quality of the classroom and discussed the findings together with strategies that would engender more favourable perceptions of the environment for students. The students in the class agreed that they needed to participate more willingly in lessons, while the teacher agreed to provide opportunities for cooperative work, vary the lesson structure, organise subject-based excursions and mark students' books at least once per week. When the re-assessment was carried out one month later, there was a substantial diminution in the discrepancy between actual and preferred environment in every dimension on the ICEQ except Differentiation. Statistically significant improvements in Personalisation, Participation, Independence and Investigation were found as a result of discussing shortfalls in actual and preferred environment scales, along with strategic interventions by the teacher in an attempt to improve the environment.

More recent research undertaken by Yarrow, Millwater and Fraser (1997) demonstrated the value of incorporating learning environment studies into teacher education. A sample size of 117 preservice primary school teachers in six separate classes undertaking the Bachelor of Education course in Queensland, provided feedback and suggestions about improving the actual learning environment over an 11-week period. The study used actual and preferred forms of the College and University Classroom Environment Inventory (CUCEI). Through a series of intervention strategies suggested

by the preservice teachers themselves, actual classroom environments were made more congruent with preferred environments, especially for the dimensions of Cohesiveness and Satisfaction. One of the most valuable outcomes of this research was the sense of participation and involvement felt by the participant to condition a more favourable environment based upon mutual support and collective ownership of the classroom. The implications of this study are that teachers, particularly in the tertiary sector, can examine classrooms with a view to improving satisfaction all around and enhancing student learning in the process.

The underlying assumption behind classroom environment research is that both teachers and students desire a positive classroom environment which will enable effective cognitive and affective learning to take place. Of the many studies that have been conducted into assessing and improving environments, there is sufficient evidence to assert that strategic interventions can significantly alter the perceptions of the environment which impact positively on learning outcomes (Fisher & Fraser, 1990; Fraser, 1998; Fraser, 1999b; Fraser, Docker & Fisher, 1988). The studies discussed above indicate that a sample of the different instruments (ICEQ, SLEQ, CES, MCI) and studies have revealed positive alterations to the learning environment of classrooms that have changed to provide a greater congruence between actual and preferred environments.

2.5.5 Research into Whether Students Achieve More Highly in Preferred Environments

Having access to actual and preferred forms of environment instruments allows investigation of whether students achieve at a higher level if they are in classrooms where there is higher congruence between actual and preferred environments. By using the 'person-environment fit' conceptualisation (Hunt, 1975), which has been modified to a person-environment interaction framework (Fraser & Fisher, 1983c, 1983d; Fraser & Rentoul, 1980), research has indicated that having dimensions of classroom

environment in accord with students' environment preferences leads to improved student achievement outcomes.

In a study conducted with 285 students in 15 classes (Rentoul & Fraser, 1986), the ICEQ was used to assess five dimensions of actual environment and five dimensions of preferred environment. When subjected to statistical analysis with the individual as the unit of analysis, the person-environment fit hypothesis was supported with higher levels of actual classroom individualisation leading to enhanced student outcomes only among the students who had higher preferences for individualisation. Conversely, higher levels of actual individualisation inhibited achievement for those students who indicated lower preferences for individualisation.

A much larger research sample of 116 junior secondary classes in 33 schools in Australia was used to explore further the relationship between achievement, actual individualisation and actual-preferred interaction (Fraser & Fisher, 1983c). Using the ICEQ, students' perceptions of the environment were obtained in the middle of the school year using five dimensions of the actual environment and the corresponding five dimensions of the preferred environment. Student outcomes were measured twice, once at the beginning of the school year, and later in the same year using six affective and three cognitive outcome measures when the class mean was used as the unit of analysis. This research revealed associations between actual-preferred environment interactions for a number of cognitive and affective outcomes, beyond that attributable to outcomes pretest, general ability and actual individualisation. The person-environment fit hypothesis was supported because the relationship between student outcomes and actual environments was positive in classes that had a greater preference for that dimension, which was not the case for those classes that held a lesser preference for that same dimension. For the dimension of Personalisation, for example, student attitudes increased with actual Personalisation for classes that held a higher preference for Personalisation, but decreased for those classes that held a lower preference for Personalisation.

While these studies suggest that actual-preferred congruence is important in affecting student achievement in affective and cognitive dimensions, Fraser (1991) has cautioned that the potential strength of this research lies not so much in decisions about moving students from one classroom to another to enhance individual achievement, but to change the actual classroom environment to make it more congruent with that preferred by the class.

2.5.6 Use of Two or More Classroom Environment Instruments in the One Study

Fraser and Fisher (1982b) have suggested the usefulness of using two or more instruments in the one study in order to measure the distinctive and common variance in students' outcomes associated with each instrument. While few of these studies have been undertaken (Ferguson & Fraser, 1998; Goh, Young & Fraser, 1995; Henderson, Fisher & Fraser, 1994; Riah, 1998; Riah & Fraser, 1998), there is much potential for assessing the unique and common components of variance in student learning outcomes associated with two classroom environment instruments.

Goh and Fraser's study of 1512 boys and girls in primary mathematics classes in Singapore utilised the simplified version of the QTI and a modified version of the MCI to investigate correlations between student attitudes and environment aspects. By subjecting the data sets to considerable statistical analysis, and by specifically undertaking correlational and multilevel analysis, the study indicated that student achievement and attitudes were better in classes that emphasised teacher Leadership, Helpful/Friendly and Understanding behaviours and less Uncertain behaviour, and also in classes that were perceived as possessing greater Cohesion and less Friction. It was found that, for attitude but not for achievement, the QTI and MCI each accounted for unique outcome variance over and above that explained by the other questionnaire.

These findings not only identify the proportion of variance in student outcomes explained jointly and uniquely by interpersonal behaviour and classroom climate, but indicate the potential merit of combining two instruments in future studies of student attitude outcomes.

Another recent study that utilised more than one learning environment instrument involved students making the transition from primary school to secondary school (Ferguson & Fraser, 1998). By using the QTI and the MCI in a way not dissimilar to Goh, Young and Fraser (1998), the study traced 1040 students across a range of transition settings and many secondary subject settings. The findings identified positive and negative changes in the perceptions of learning environments during the transitions from primary to secondary, although these varied according to student gender and the sizes of the schools involved in the transition. In general, the research suggested that students from small-sized primary schools experience more deterioration in learning environment perceptions than students from larger-sized primary schools (see Section 2.6). While no commonality analysis was undertaken in Ferguson and Fraser's research into students moving between primary and secondary school, the application of two different instruments to cross reference complementary aspects of classroom environment presents grounds for further use of existing instruments in novel and potentially valuable ways.

2.5.7 School-Level Environment

The macro-conceptualisation of the school, as distinct from the micro-conceptualisation of the classroom, has been the object of research in its own right (Halpin & Croft, 1963; Rentoul & Fraser, 1983; Stewart, 1979). Early studies into the effectiveness of school climate centred on physical aspects of the school, such as staffing ratios and school size, with a view to identifying the structural dimensions that were associated with positive schooling outcomes. Instruments such as the Organisational Climate

Description Questionnaire (OCDQ) were used by Halpin and Croft (1963) to measure teacher perceptions of the principal and to infer the effectiveness of school leadership and its impact on the wider school environment.

A sub-strand of research, mounted in the 1970s and 1980s, was designed to measure the relationship between the respective perceptions of the school and classroom environment (Drebeen, 1976; Epstein & McPartland, 1976; Finlayson, 1973; Fraser & Rentoul, 1982; Gray, 1981; Ogilvie & Sadler, 1979; O'Reilly, 1975). Using two instruments, the SLEQ and the ICEQ, Fraser and Rentoul (1982) elicited teachers' perceptions of the school's Affiliation, Professional Interest, Achievement Orientation, Formalisation and Innovativeness, as well as teachers' perceptions of classroom Personalisation, Participation, Independence and Investigation and Differentiation. This study concluded rather tentatively that a relationship between the school and classroom climate existed, indicating that more Formalisation in the school (such as rules, structures and codified behaviour) was linked with lower levels of classroom Involvement as seen by teachers in dimensions such as Participation, Independence and Differentiation.

Relationships between the perceived environment of the classroom and the school have also been tenuously established by research involving other instruments and methodologies. Using the Quality of School Life (QSL) questionnaire, Epstein and McPartland (1976) involved 4,266 primary and secondary school students to measure the following: *satisfaction* – with school in general, involving perceptions of peers and teachers, extra-curricular activities and rates of absenteeism; *commitment* – to school work, including future plans and goals and attitude towards learning and study; *attitude* – towards teachers, incorporating perceptions of classroom quality, levels of cohesion and participation.

Individual sub-strands of the instrument (SAT, COM, TCH) were developed to assess these dimensions and were subjected to statistical interrogation to check discriminant validity and reliability. The findings indicated that a formal relationship existed

between the dimensions of school organisation and dimensions of satisfaction which do translate to classroom learning. This study therefore looked at affective learning activities such as participation and cohesion rather than cognitive outcomes.

That differences in school environment do exist is attested to by research conducted by Dorman and Fraser (1996), who undertook a study of 32 schools in Queensland to see whether variations were detectable between the environment in Catholic and government schools. Using 208 teachers, a new instrument entitled the Catholic School Environment Questionnaire (CSEQ) was developed with 57 items in seven scales: Empowerment, Student Support, Affiliation, Professional Interest, Mission Consensus, Resource Adequacy and Work Pressure. Significant differences in the nature of the school environments were found in this study, with teachers in Catholic schools perceiving more favourable environments with greater Empowerment, Mission Consensus, Student Support, and Resource Adequacy and less Work Pressure. This study supported Glathorn's (1984) previous assertion that subtle differences in school climate are in due proportion to the satisfaction that is perceived by staff and students. While this study did not measure the impact of the school environment on classroom environment, it offers insight into the way that whole school environments are perceived and how dimensions of school climate can be measured and cross-referenced with classroom environment perceptions.

While there is some merit in the notion that the school environment is little more than the sum of classroom environments, the school as an organic whole requires a greater degree of understanding because of the number of organisational variables that co-exist and interact with each other. Past studies have indicated that a reasonable degree of independence between the classroom environment and the school environment can be maintained (Dorman, Fraser & McRobbie, 1995). Other studies (Epstein & McPartland, 1976; Finlayson,1973; O'Reilly, 1975) suggest that there is a dynamic between the two that should be the object of further research and understanding. O'Reilly's research (1975) specifically tried to establish a link between the macrocosm of the school and the microcosm of the classroom. Using a four-pronged method of

investigation involving a standardised achievement test for mathematics to measure cognitive achievement, biographical data, school and college ability data and the LEI, the research concluded that the classroom environment is not only a significant factor in student achievement, but that the larger school environment also has some impact on student learning.

These studies, while relatively few in number, have established loose associations rather than formal links between the dialectic of school and classroom environments and the way in which they affect student learning outcomes. Herein lies fertile ground for future research.

School-level environment studies have not only been used to investigate relationships between classroom and the school, but have also been used to extract data that have formed that basis of professional development of school leaders. Using the Principal Interaction Questionnaire (PIQ) with a sample of 56 schools throughout Australia, Cresswell and Fisher (2000) elicited information about school environment and suggested ways in which it could inform leaders in schools about directions for professional development. This study demonstrates the versatility and potential of school level environment research that opens the possibility for further studies of this kind.

2.5.8 International and Cross-Cultural Research

A large number of international studies (Fraser, Pearse & Azmi, 1982; Goh, Young & Fraser, 1995; Hearn & Moos, 1978; Hofstein, Gluzman, Ben-Zvi & Samuel, 1979; Hofstein & Lazarowitz, 1986; Idiris & Fraser, 1997; Levin, 1980; Sharan & Yaakobi, 1981; Walberg, Singh & Rashar, 1977) and cross-cultural studies (Aldridge, Fraser & Taylor, 2000, Aldridge, Fraser & Huang, 1998; Fraser & Chionh, 2000; Fraser, McRobbie & Giddings, 1993; Kim, Fisher & Fraser, 1999; Riah, 1998; Riah & Fraser, 1998; Schibeci, Rideng & Fraser, 1987; Wong & Fraser, 1995) have been undertaken

to explore the cultural influences on perceptions of actual and preferred learning environments. This research, too extensive to explore in depth, has revealed many insights into the unique classroom environments that are established in different cultural settings, and the way in which perceptions of the environment affect student learning outcomes.

One of the earliest international studies undertaken in developing countries was mounted by Walberg, Singh and Rasher (1977) in India. Using a sample of 3,000 tenth grade students in the state of Rajasthan, 15 scales from the LEI were translated into Hindi and administered to the study sample. In this study, strong and statistically significant associations were found between cognitive achievement and perceptions of classroom environment.

Associated studies conducted in developing countries in the 1970s included Brazil, Indonesia, Jamaica and Thailand (see Fraser, 1994). The intention behind the studies was to measure student perceptions of the learning environment in those countries and to see whether or not common associations existed between one environment and another.

Interesting and valuable classroom environment research has been conducted to assess environment perceptions and environment-outcome associations in different schooling systems in Israel (Sharan & Yaakobi, 1981) and Canada (Randhawa & Michayluk, 1975). In order to assess whether social climate affected students' motivation to learn, the LEI was administered to 572 Grade 10 Biology classes in Israel. The study aimed to measure whether different environments existed in kibbutz schools, which were regarded as more student-centred and socially-oriented than the 'achievement-centred schools' in urban areas in Israel. For seven of the nine scales of the LEI, more positive perceptions of classroom environments were found in kibbutz schools, in terms of more Cohesiveness, Cooperation and Satisfaction and Less Competitiveness, Cliqueness, Favouritism and Difficulty. This study revealed that, despite the same Biological

Sciences Curriculum Study (BSCS) curriculum package and inquiry-based approach to teaching in Israel, kibbutz schools had established different social environments that were perceived more positively by students. This research also indicates that school-wide initiatives aimed at promoting positive relationships can engender variable school climates that affect student learning variables such as motivation (see Section 2.5.7).

A study involving urban and non-urban schools (Randhawa & Michayluk, 1975) was conducted in Canada utilising the LEI to distinguish between perceptions of the learning environment. Using a sizeable sample from urban and rural areas, this study found significant differences for a number of scales, indicating that urban schools were better equipped, offered a better learning orientation, challenged students more effectively and generally generated superior learning environments. The study identified a number of concerns for the Canadian Government, specifically related to improving the quality of rural education by improving facilities and attracting high-quality teachers to non-metropolitan regions.

One of the earliest studies directed towards understanding cultural differences and their impact on educational environments was conducted by Fraser, Pearse and Azmi (1982). This research involved the administration of the ICEQ and the CES to a sample of 373 Indonesian students, and results were compared to those of two studies conducted earlier in Australia which also involved the ICEQ (Fraser, 1981a; Fraser & Rentoul, 1980). The purpose of this research was to measure whether or not there were similar levels of classroom individualisation in both countries and, if so, whether or not these were associated with higher levels of learning. By comparing the results of the two separate studies, the research indicated that there were differences in perceptions of the learning environments between the countries. Relative to Schibeci, classes in Indonesia had higher levels of Student Involvement, Affiliation, Teacher Support and Order and Organisation, yet they were perceived as having considerably less Independence and Differentiation. These results indicate that individualised classrooms were more prevalent in the Australian context, although more positive

levels of other environment indicators, such as Teacher Support, Order and Organisation, were apparent in Indonesia.

Cross-cultural studies of learning environments are relatively new. They have sought to understand both student and teacher perceptions of the classroom learning environments. A collaborative cross-national study involving researchers from two countries, the Netherlands and the United States, was undertaken using the QTI to compare perceptions of teachers' behaviours in the two countries (Wubbels & Levy, 1995). Cross-validation and refinement of the instrument resulted in a 64-item version of the QTI, that showed that students' perceived that American teachers are more strict while Dutch teachers give more responsibility and freedom to students.

An examination of science classrooms in a cross-cultural context undertaken by Aldridge and Fraser (1997, in press) yielded important methodological and research principles that need to be acknowledged when framing Western research into an Eastern context. While the research found modest differences in classroom environments based upon the application of the What Is Happening In This Class (WIHIC) questionnaire, the use of classroom observations and interviews added depth to conclusions that would be drawn about perceptual differences in classroom environments in cross-cultural research. Qualitative data gathered in this study indicated for Taiwan the following important socio-cultural influences that affect the life of classroom teachers:

- examination-driven nature of the curriculum
- pressure exerted by external examinations
- competitive nature of the teaching.

An illuminating investigation into constructivist learning environments, of which there have been many in recent times (Dryden & Fraser, 1998; Taylor, Dawson & Fraser,

1995; Taylor & Fraser, 1991; Taylor, Fraser & Fisher, 1997; Taylor, Fraser & White, 1994), was undertaken in Korea to assess the impact of constructivism in a new science curriculum (Kim, Fisher & Fraser, 1999). Using a sample of 1,083 students and 24 science teachers in 12 different schools, the study employed the actual and preferred versions of the Constructivist Learning Environment Survey (CLES) to elicit student perceptions of the classroom environment. The purpose of the research was to investigate whether science curriculum reform in Korea had a positive effect on the classroom environment by cultivating more inquiry-centred learning and classrooms based upon student-teacher negotiation. The outcome of this research indicated that there were statistically significant relationships between classroom environment and student attitudes towards science. Most importantly, results suggest that favourable student attitudes could be promoted in classes where students perceive greater personal relevance and share control with teachers through negotiated learning.

International studies and cross-cultural studies have led to the translation and modification of existing instruments that have been used to understand, compare and contrast learning environments in various countries. Findings from this field of research have affirmed contextual variations in student perceptions of classroom environments, further attesting to the versatility of the instruments themselves and the importance of the socio-cultural context in which learning takes place.

2.5.9 Incorporating Learning Environment Assessment in Teacher Education

A potentially rich, although largely underdeveloped use of classroom environment ideas lies in the assistance that they could provide to practising and beginning teachers to interpret and modify classroom environments. Fraser (1993) has suggested that there are many advantages of including classroom environment ideas in teacher education, which include:

- The development of methods which will enhance professional critique and enable teachers to be more reflective about their classroom practice.
- The awareness that teachers can gain about important psychosocial dimensions of the classroom.
- The possibility for teachers to measure and systematically alter aspects of the classroom environment.
- Another source of important formative and summative information that will assist in assessing the performance of student teachers.
- The efficiency and accuracy of the instruments that allow for quick return of feedback information from which attention to teaching methodologies and/or evaluation of performance can be made.

Studies such as those conducted by Thorp, Burden and Fraser (1994) with a Grade 8 class of 34 students (see Section 2.5.5) are indicative of the potential value of incorporating learning environment studies into teacher education programs.

One documented example of the use of classroom environment studies in teacher education was that undertaken by Duschl and Waxman (1991), who used the ICEQ to elicit students' perceptions of the classroom environments of student teachers. Rather than form part of the summative data upon which the effectiveness of teaching was made, the information was used for formative purposes and was regarded as useful in offering counsel and guidance to student teachers during their teaching practice. Use of these instruments in the field of inservice teacher training holds many possibilities for the future (Yarrow, Millwater & Fraser, 1997).

2.5.10 Determinants of Classroom Environment

Voluminous research over a lengthy period of time has been conducted into some of the determinants of classroom environments. Studies have shown that a wide variety of

determinants such as gender, type of school, family background, school subject and socio-cultural context influence the environment of the classroom.

Seminal work undertaken by Jackson and Getzels (1959) into the cause of dissatisfaction with school among 531 adolescents revealed gender-specific responses to dissatisfaction and disinclination to learn: boys tend to blame environmental influences as causing dissatisfaction while girls attribute feelings of dissatisfaction to personal inadequacy. This initial research was responsible for spawning a sub-strand of research into educational environments during the 1970s and 1980s on the role of gender as an independent variable in research (Byrne, Hattie & Fraser, 1986; Lunn, 1972; Owens & Straton, 1980; Rentoul & Fraser, 1980; Walberg, Fraser & Welch, 1986; Young & Fraser, 1994). Studies in a variety of settings utilising a range of instruments have attempted to elicit information about the influence of gender on the learning environment of the classroom. For example, Owens and Straton's research (1980) developed and applied the Learning Preference Scale Student (LRSS) questionnaire to 1,643 students in Sydney to assess the importance of cooperative, competitive and individualised learning for learning outcomes. Statistically significant findings revealed that girls expressed a greater desire for cooperative learning while boys preferred more competitive and individualised learning modalities. The research also revealed that gender-specific preferences for learning altered at different year levels, with higher levels of competitiveness being preferred in senior secondary (Grade 10 and 11) as opposed to higher levels of cooperative learning in lower grades (Grade 4 and 5). These findings related to gender-specific preferences for learning involving competition and cooperation were supported by Byrne, Hattie and Fraser (1986) in their research involving students across Grades 9-12.

Yet another of the many studies deliberately aimed at measuring gender differences as an independent variable in classroom environment research was undertaken with a large sample of 2,000 students in Grade 3 and 4 (Lunn, 1972). The study revealed differential students' perceptions of their environment based upon gender, with girls

perceiving greater classroom involvement, greater interest and better relationships with teachers, together with a more positive perception of doing well, relative to boys. While boys were seen to have a better self-image and to be less anxious in the classroom, the overall results were that girls had more favourable attitudes towards school and class for those dimensions measured.

These early studies into sex differences have formed the basis of ongoing investigation and research into gender as a determinant of classroom environment. Recent research into science classrooms in secondary schools has been prompted by the under-representation of women in science and technology fields along with the belief that boys have outperformed girls in achievement. The results of these studies have yet to yield consistent results that can produce a generaliseable understanding of the effect of gender on the classroom environment. Using the ICEQ in a study involving 1,733 Grade 10 students to assess classroom environments in Singapore, Tock (1995) discovered that female students perceived higher levels of Independence and Participation, while males perceived higher levels of Differentiation at the classroom level. Use of the SLEI in Tasmania (Henderson, Fisher & Fraser, 1995) and Singapore (Wong & Fraser, 1994) has shown that more positive perceptions of laboratory settings are held by girls for all scales of the instrument with the exception of Open-endedness. The use of the QTI has also indicated that girls perceive the interpersonal behaviours of teachers more positively than boys (Rickards, Fisher & Fraser, 1996). The latter research supports the findings and conclusions of earlier research undertaken by Lunn (1972).

While these studies are indicative of attempts to view gender as a determinant that might affect perceptions of classroom environment, other studies into gender have produced indeterminate or contradictory results. Use of the LEI involving 1,269 Grade 8 students in Taiwan (Lin & Crawley, 1987) found that none of the scales showed significant differences in perceived environment based upon gender, which does not

support the research outlined above. This accepted, gender as a determinant of classroom environment has been the object of much research and has revealed various associations between contexts and learning outcomes over a period spanning three decades.

Another determinant of classroom environment that is directly related to student learning outcomes is innate intelligence or cognitive ability. Numerous studies have attempted to view the impact of student ability on the classroom environment (Astin & Holland, 1961; Fisher & Fraser, 1980; Fordham, 1978; Fraser, 1978, 1981c; Fraser, Welch & Walberg, 1986; Rentoul & Fraser, 1980). Various research samples ranging from 18,000 students (Fraser, Welch & Walberg, 1986) to 274 students (Fordham, 1978) have been involved in responding to a variety of classroom instruments (LEI, MCI, ICEQ) at all levels of the educational spectrum (primary, secondary, tertiary) with a view to establishing relationships between intelligence and classroom environment. Like the studies of the role of gender in influencing perceptions of the environment, results of the research have been varied and preclude generalised assertions about links between ability, student achievement and perception of the environment.

Other independent variables that have formed the basis of extensive classroom environment research include family background (Fraser, Welch & Walberg, 1986; Marjoribanks, 1991), the quality of school facilities (Ainley, 1978; Beck, 1980), organisational climate (Ogilvie & Sadler, 1979; Thomas, 1976; Thomas & McTaggart, 1983), school charactertics such as finances and instructional programme (Werts & Lunn, 1969), student grouping (Lawrenz & Munch, 1984), student anxiety (Fraser, Nash & Fisher, 1983), class size (Walberg, 1969a), social climate (Brookover, Schweitzer, Sneider, Beady, Flood and Wisenbaker, 1978), social class (Miller, 1970), teacher style (Kelly, 1980), teacher morale (Coughlan, 1970), teacher sex (Anderson,

1971; Lawrenz & Welch, 1983), teacher attitude (Tisher, 1984), school subject (Hofstein, Gluzman, Ben Zvi & Samuel, 1979; Steele, Walberg & House, 1974) and types of schools, including urban and vocational (Harty & Hassan, 1983; Hearn & Moos, 1978; Hofstein, Gluzman, Ben Zvi & Samuel, 1980; Randhawa & Fu, 1973, Randhawa & Michayluk, 1975, Walberg & Anderson, 1972).

Table 2.3 highlights the variety of research that has been conducted to investigate associations between variables such as gender, ethnicity, family background, intelligence, types of schools and teacher characteristics. Table 2.3 displays the range of environment instruments used and the different sample sizes that have spanned decades of research activity, from Astin and Holland (1961) to Creton, Hermans and Wubbels (1990). So intense was this field of research in the 1970s and 1980s that new theoretical and conceptual frameworks were investigated in an effort to explain the relationship between determinants of classroom environment and their influence on perceptions of the environment. One such study (Haladyna, Olsen & Shaughnessy, 1982) distinguished between exogenous variables such as gender, socio-economic status and general ability and endogenous factors that were under the influence of the school. Purporting a relationship that Y= f (S, J, E) where Y= attitude, S = student, T = teacher and E= environment, the study attempted to measure the relationship between exogenous variables and student attitudes towards science. By amalgamating aspects of previous instruments including the LEI, MCI and CES, the Inventory of Affective Aspects of Schooling (IAAS) was developed and applied with limited success, with the identification of consistent relationships between exogenous influences and students' attitudes towards science proving elusive.

Table 2.3
A Sample of Studies of Determinants of Classroom Environment

Determinant	Study	Instrument	Sample
Gender	Rentoul & Fraser (1980)	Individualised Classroom Environment Questionnaire (ICEQ)	285 students in 15 classes
	Owens & Straton (1980)	Learning Preference Scale- Student Questionnaire (LRSS)	1643 students
Family background	Fraser, Welch & Walberg (1986)	National assessment data	18,000 students in 700 schools
Ethnicity	Sheehan (1978)	My Class Inventory (MCI), Minnesota Teacher Attitude Inventory (MTAI)	1568 5th grade students and 84 teachers
Intelligence	Astin & Holland (1961)	Environmental Assessment Technique (EAT)	335 tertiary institutions
	Fraser (1981c)	Individualised Classroom Environment Questionnaire (ICEQ)	1083 students in 116 classes
School subject	Hearn & Moos (1978)	Classroom Environment Scale (CES)	207 classes in 19 schools
Teaching style	Kelly (1980)	True/False Questionnaire	14-year-old students in 14 different countries
Facilities	Ainley (1978)	Dimensions of science laboratories	3,000 students from 105 classes
Types of schools	Randhawa & Fu (1973)	Learning Environment Inventory (LEI)	96 classes of grade 8-11 students
Organisational climate	Ogilvie & Sadler (1979)	School Awareness Questionnaire (SAQ)	249 teachers
Teacher characteristics			
Gender	Lawrence & Welch (1983)	Learning Environment Inventory (LEI)	331 primary and senior science classes
	Anderson (1971)	Learning Environment Inventory (LEI)	8 secondary schools in Canada
Experience	Creton, Hermans & Wubbels (1990)	Questionnaire on Teacher Interaction (QTI)	teachers from numerous subjects in secondary schools throughout Holland
Relationships	Harty & Hassan (1983)	Pupil Control Ideology Form (PCIF) Classroom Environment Scale (CES)	800 students in 40 classes

The implication of this research is that it seeks to understand the impact of variables on classroom environment and the way in which they might affect perceptions of the environment, student learning outcomes (Roadrangka & Yeany, 1985) and equity (Sanford, 1987) of educational opportunity at the classroom level. Far too extensive to discuss in detail here, the volume and extent of studies has added another important strand to classroom environment research over a lengthy period of time.

A more comprehensive longitudinal study conducted in Tasmania involving the ICEQ investigated learning environment outcomes in 116 Grade 8 and 9 primary science classes (Fisher & Fraser, 1982a). The pretest was administered during the middle of the year and involved three cognitive and six affective measures and a posttest was administered at the end of the year. The outcomes of this research, which was subjected to considerable statistical interrogation, revealed that classrooms that higher rates of participation were linked with had higher levels of student interest in science, and classes that were perceived as having higher levels of investigation promoted a greater capacity in students in drawing conclusions and generalisations.

Past studies that have attempted to investigate the transition to secondary school have also utilised environment variables as dependant variables (Feldlaufer, Midgley & Eccles, 1988; Ferguson, 1998). For the purposes of this study, independent variables employed are the use of actual and preferred perceptions of the classroom environment, akin to that used in a rich tradition of such studies reported by Fraser (1994), including Hofstein and Lazarowitz (1986), Raviv, Raviv and Reisel (1990), and Wubbels, Brekelmans and Hooymayers (1991), and student perceptions of Satisfaction as used by Moos (1973).

2.5.11 Using Qualitative Data to Augment Classroom Environment Research

Extensive discussion over the relative merits of quantitative and qualitative research has been a point of contention among academics for some time (Cook & Reichardt, 1979; Eisner, 1967, 1976; Erickson, 1986, 1998; Fetterman, 1988; Filstead, 1979; Howe, 1988; Kemmis & Robottom, 1981; Krathwohl, 1993; Miles, 1984; Miles & Huberman, 1984; Owens, 1991; Patton, 1980,1987; Tobin & Fraser, 1998; Wolf, 1983). For many years, theoretical disputation stymied the complementary use of the two research methods, both of which possess the capacity to provide important insights into classroom environments. Erikson's (1986) important contribution to reconciling the difference was in acknowledging that, while quantitative methods that attempt to generalise classroom events are expressed in terms of error variance, qualitative methods allow for variations that are legitimate in developing specific understanding of classroom events. Accordingly, the gradual acceptance of both quantitative and qualitative research methods as valid indicators of classroom environments has led to a series of studies that have compared research methods in order to understand and study different aspects of classroom environment (Firestone, 1987; Fraser & Tobin, 1989; Smith & Fraser, 1980; Tobin & Fraser, 1989; Tobin, Kahle & Fraser, 1990). While Firestone (1987) and Eisner (1976) have identified potential benefits of combining quantitative and qualitative research methods, Fraser (1994) has argued that both have their own limitations but have complementary advantages in the research field. Furthermore, Fraser and Tobin (1991) suggest that findings and conclusions that are supported by a range of data collection methods have greater credibility because they are dually asserted by independent research paradigms. In recent years, there has been a widespread application of both quantitative and qualitative research methods that have aimed to understand different aspects of educational research including perceptions of school principals (Firestone, 1987), evaluation of curricula (Fraser, 1980), exemplary science teachers (Fraser & Tobin, 1989) and socio-cultural aspects of the learning environment (Aldridge & Fraser, 1997).

In an innovative approach to curriculum evaluation, Smith and Fraser (1980) gathered a large amount of qualitative data to guide modifications to the High School Education Law Project (HELP) before publication and widespread distribution to schools. Rather than rely on pen-and-paper responses to questionnaires, the researchers established and reported on issues that were considered important based on discussion and interviews with both teachers and students. As much as modification to the HELP curriculum package was undertaken, the confluence of the two research paradigms presented an important direction for educational research, which was later to find its specific expression in classroom environment investigations.

Exemplary teachers and excellence in science teaching were specific areas of academic study in the latter 1980s. Studies (Penick & Yager, 1983; Tobin & Fraser, 1987, 1988; Tobin, Treagust & Fraser, 1988) aimed to compare and contrast learning environments established by exemplary teachers of biology, physics and chemistry in upper secondary school compared to normative groups. Using the same research objective, Fraser and Tobin (1989) developed extensive qualitative methodology advocated by Erikson (1986) involving 13 researchers and 26 teachers in Perth, in order to measure psychosocial aspects of classroom environments established by exemplary teachers. This ambitious research utilised a range of qualitative data including observations of lessons, interviews with teachers and students, examination of curriculum materials and tests, and an examination of student work. In addition, the MCI and the CES were administered in some of the classes involved in the study, with the findings of both research methods being compared and contrasted. Student perceptions, assessed both qualitatively and quantitatively, indicated that differences in the psychosocial aspects of the classroom environment were apparent and distinguishable between exemplary and non-exemplary science teachers. Both research strands identified more positive perceptions of the learning environment in classes taught by exemplary science teachers.

Quantitative and qualitative research methodology has been applied in studying 'target students' (Fraser, 1986; Sadker & Sadker, 1985; Tobin, 1989; Tobin & Gallagher, 1987a, 1987b; Tobin & Malone, 1989). Defined as those students who dominate classroom interactions, target students have been the object of research for the way in which they affect the dynamics of the classroom and for the types of characteristics and stimuli that incline students to become target students. Tobin and Gallagher (1987) used quantitative and qualitative data methods to investigate target students in the classes of 15 science teachers in two co-educational schools in metropolitan Perth. Using ethnographic techniques and three test instruments which measured logical thinking ability, cognitive outcomes and the Student Engagement Questionnaire (SEQ), the study sought understanding of the role of students in the classroom. The findings from this research, which drew heavily on the two data sources, indicated that target students were often male, had higher formal reasoning ability, were self-motivated, and were often selected by the teacher to participate in classroom activities to the exclusion of other interests and ability groups. Tobin and Malone's study (1989), which utilised qualitative data gathering over an eight-week period in the form of interviews with students and teachers, corroborated the earlier study to a large measure by confirming the presence of 'target student characteristics' such as male gender and self-motivation, and that the role of the teacher was instrumental in cultivating an environment where target students would dominate. In addition, this study revealed that the existence and dominance of target students in classrooms had a deleterious effect on the learning of other students in the class, who were often marginalised by the attention given to the dominant target students.

Fraser and Tobin (1991) reported a study of target students which utilised qualitative data based upon student perceptions of classroom environment for 21 target students and 22 students who found a normative sample identified by their teachers from Grade 8 classes. Student perceptions were also assessed through the CES. Findings revealed that target students possessed more favourable perceptions of the classroom environment than other students, registering higher Involvement and Rule Clarity than

non-participant students. Qualitative data supported empirical findings in which target students were much more involved in the learning process when compared to the students who formed the normative sample, and who were often passive and intermittently disengaged. In each of the studies conducted in this area, researchers have concluded that differential rates of involvement exist and that they receive varying treatments, responses and behaviours from teachers.

Studies of classroom environments that promote higher cognitive learning have made extensive use of quantitative and qualitative data methods (Fraser, Rennie & Tobin, 1990; Tobin, Kahle & Fraser, 1990). Using Erikson's interpretive methodology (1986), these studies also used the ICEQ and CES to measure selected environment scales such as Personalisation, Participation, Order and Organisation, and Task Orientation. Differences in the classroom environment established by two teachers were established by both quantitative and qualitative data. An important methodological feature of the study was that the classroom environment scales used in the questionnaire were selected after an amount of fieldwork had already been undertaken. The CES utilised the Personal form as outlined in Section 2.4.3. Wayne's classroom was more organised and less responsive to change, with the teacher conceptualising his role in the classroom in terms of the metaphor 'captain of the ship'. Sandra's classroom, which emphasised group work and personal management techniques, was perceived to have higher levels of Personalisation but lower levels of Order and Organisation. Sandra conceptualised her role as 'entertainer', producing different emphases in the classroom that were reflected in individual student perceptions of the environment. Differences in the classroom environment that were established by the administration of the instruments were consistent with observation and interpretation of qualitative data gathered.

Comparative research into classroom environments in Taiwan and Australia (Aldridge & Fraser, 1997; Aldridge & Fraser, in press; Aldridge, Fraser & Huang, 1999; Aldridge, Fraser, Taylor & Chen, 2000), which involved the use of the WIHIC with

large samples of students in both countries, made extensive use of qualitative data collection and analysis. Quantitative data analysis of responses from 1,879 students in 50 classes in Taiwan and 1,809 students in 50 classes in Australia revealed that the largest difference in perception of classroom environments was for the scales of Involvement and Equity. While students in Australia perceived higher levels of Involvement and Equity, students in Taiwan experienced higher Satisfaction with science classes than students in Australia. Classroom observation and student interviews provided a rich source of information that helped to explain aspects of the quantitative findings from the application of the WIHIC. Anecdotes based upon questionnaire items conveyed socio-cultural aspects of the learning environment that could not be conveyed through observations, particularly the degree of student respect held for teachers as well as the level of student motivation to learn in the subject. These anecdotes helped to explain differences in the scale means of the questionnaire and presented a much more complete socio-cultural profile of the influences which act on classroom environments. These included:

- the examination-driven curriculum in Taiwan, which finds itself expressed in textbooks which require wholesale absorption as distinct from more varied teaching methodologies in Australian schools
- the pressure exerted by parents and teachers in Taiwan to perform well in examinations that opens opportunity for entry into 'star' schools
- the competitive nature of teaching and learning in Taiwan because of the overt use of class results to measure teachers' and students' performance.

These significant differences in perceptions of the learning environments between the two countries have strong commonalities with the socio-cultural environment. Using both quantitative and qualitative data collection and analysis, more meaningful interpretation and understanding of the environment can occur.

A particularly interesting and intensive study was conducted by Tobin and Fraser (1998) using both qualitative and quantitative data in one science class in Australia. This distinctive research investigated a Grade 10 Chemistry class, with several researchers visiting the class four times per week over a five-week period. Qualitative data included classroom observation, video recordings and interviews with the teacher, students, school administrators and parents. Quantitative data were gathered through an instrument that drew heavily on scales in the Constructivist Learning Environment Survey (CLES), and also included two extra scales of Commitment and Teacher Support. The researchers were able to discover important features about the classroom environment of the science class that was being investigated. They detected greater levels of Personal Relevance, Critical Voice and Teacher Support relative to other science classes in the school. In addition, the intensive nature of the data gathering revealed that students from within the same class perceive quite different environments. This particular study suggests the importance of multilevel and complementary forms of data gathering to understand more comprehensively the nature of classroom environments and how they can be improved for the benefit of both teachers and students.

In summary, the use of quantitative and qualitative methods to research, interpret and modify classroom environments has become a feature of recent endeavours in educational research. The application of both forms of data gathering has been advised (Fraser, 1994, 1998; Tobin & Fraser, 1998) and has provided much insight into student and teacher perceptions of classroom environment and the education process. Both quantitative and qualitative data gathering was employed in this current study, the benefits of which are outlined in Chapter 3. In addition, the use of preliminary field work to guide the development of scales for the questionnaire (as detailed in Section 2.5.11) was an important part of the methodology adopted in the current study.

2.5.12 Teacher Assessment and Teacher as Researcher

Fraser (1998) reported an innovative teacher assessment scheme adopted in the United States entitled STAR (System for Teaching and Learning Assessment and Review), which has been tailored to assess four performance dimensions in teaching. Three of the performance dimensions are Preparation, Planning and Evaluation (homework, assessment, etc.), Classroom and Behaviour Management (student engagement, monitoring behaviour, etc.) and Enhancement of Learning (thinking skills, feedback etc.), while the fourth dimension includes Learning Environment. Teachers who, through application of the STAR system, have been found to be effective in the Learning Environment dimension, were found to have encouraged positive interpersonal relationships in the classrooms, demonstrated interest and enthusiasm with learning, and encouraged active involvement of students in the class.

Teacher assessment that correlates key dimensions of classroom pedagogy with classroom environment indicators has the potential to inform teachers of modified emphases in teaching which serve to improve student learning outcomes (Duschl & Waxman, 1991; Yarrow, Millwater & Fraser, 1997). It can also assist teachers to become more critically reflective about classroom practice as a standard part of their professional life in terms of their awareness of and responsiveness to student perceptions of classroom environments (Rentoul & Fraser, 1981).

There has also been a trend to include teachers in collaborative research into classroom environments (Taylor, Dawson & Fraser, 1995). Engaging teachers in research has the potential advantage of developing a 'professional' culture that is more aware of classroom environment dimensions and responsive to innovations in teaching and learning that can impact positively on the classroom environment and student learning outcomes.

2.6 Classroom Environment Research During the Transition from Primary to Secondary School

A developing field of interest and research is understanding the peculiar classroom environments that exist in upper primary and lower secondary levels (Feldlaufer, Midgley & Eccles, 1988; Ferguson & Fraser, 1996, 1998). This specific area of research is emerging in response to concerns about the disinclination that students allegedly experience in making the transition from one set of educational expectations to another, often resulting in long-term disengagement with schooling.

While there is mounting awareness of the need to research and understand upper primary and lower secondary education, there has been relatively few studies undertaken into classroom environment as a mediating influence in transition. Research generally into the transition between upper primary and lower secondary schooling has suggested that difficulties that are often encountered are causally related to the onset of adolescence which results in altered motives, values and behaviour among students. Specific aspects of the transition that have been found to cause discontinuities include:

- Self-management, where adolescents participate less in decision making and have fewer choices in junior secondary school (Rounds & Osaki, 1982; Ward, Mergendollar & Tikunoff, 1982).
- Teaching and assessment practices, which include less collaboration and cooperation, with more formal and objective evaluation methods (Marshall & Weinstein, 1984; Rozenholtz & Simpson, 1984). These studies indicate increased student dissatisfaction through a loss of involvement and engagement in teaching and assessment methods.
- Teacher/student relations, for which students perceive a decline in teacher support following transition to secondary school (Hawkins & Berndt, 1985; Trebilco, Atkinson & Atkinson, 1977).

In order to assess the specific and mediating role of classroom environments in upper primary and lower secondary classrooms, a longitudinal study involving 117 sixth grade classes and 387 seventh grade classes was undertaken in the United States (Feldlaufer, Midgley & Eccels, 1988). Using three different instruments, the Student Classroom Environment Measure (SCEM), the Teacher Classroom Environment Measure (TCEM) and the Observer Classroom Environment Measure (OCEM), the research aimed to establish whether there were noticeable differences in student perceptions of the classroom environments in upper primary and lower secondary school, respectively. There were significant differences across transition in the perceptions in the classroom environments in mathematics, particularly in terms of:

- A negative impact on motivation, as a result of increased task orientation and decreased opportunities for classroom interaction in secondary school than was apparent in the upper primary setting.
- A change in the perception of teacher support, with teachers in lower secondary being perceived as less caring, less friendly and less warm than primary teachers.
- Increased difficulty of the work, although the study did not assess whether the increased difficulty was attributable to changes in performance, altered teaching practices or other reasons.

These findings led the researchers to conclude that differences of perception between pre-transition and post-transition classrooms were not only salient but little short of debilitating for some students. Further, the findings suggested that there was a developmental 'mismatch' between the specific needs of adolescents and the prevailing psychosocial characteristics of classrooms in the lower secondary school.

Ferguson and Fraser's research (1996, 1998) into gender and school size as influencing factors in affecting students' perceptions across the change from primary to secondary school also revealed in that secondary school environments were considered less

favourable than primary schools on some dimensions. Using the My Class Inventory (MCI) (Fisher & Fraser, 1981) and a modified version of the Questionnaire on Teacher Interaction (QTI) (Brekelmans, Wubbels & Creton, 1990), two data-gathering stages were employed using a research sample of 1,040 students moving between 47 feeder elementary schools and 16 linked high schools. While secondary schools were perceived as containing Less Friction and Competitiveness, there was a noticeable decline in the quality of student-teacher relationships, particularly as teachers were perceived to be less helpful and friendly and understanding of student needs. This corroborates a finding of Feldlaufer, Midgley and Eccels' earlier research (1988).

Differential changes in learning environment based upon gender across transition in Ferguson and Fraser's study revealed that boys experienced greater satisfaction in secondary school classrooms than was apparent in primary school, but that girls experienced a decrease in satisfaction during transition. Conversely, girls reported more favourable changes in perceptions across transition in the area of decreased classroom friction and more favourable views of teacher behaviour than did boys. This study also revealed that school size exacerbated some of the adjustment difficulties experienced by students who made the transition into secondary school from medium-sized or small-sized primary schools.

Both of these studies, despite using different classroom environment instruments and research samples in different countries a decade apart, reveal that sizeable differences in the perception of classroom learning environment are associated with the transition between primary and secondary schools. Generally the studies indicate that there is an overall deterioration in psychosocial aspects of the learning environment in secondary schools, with decreased teacher support and negative views of teacher behaviour being more prevalent at the secondary level, thus producing one amid several disjunctions that present difficulties for students in the transition process.

The present research provides cogent grounds for further understanding and assessment of the classroom environments of students who make the transition between primary and secondary school. The nature of the disjunctions that have been detected in previous research and the peculiar features of the classroom environments in upper primary and lower secondary classrooms, together with the perceptions of students involved in the transition, are self-sustaining reasons for the current research. In addition, the need to devise relevant scales and employ diverse data-gathering methods (see Section 2.5.11) that elicit information from the students' individual perception of their environment (see Section 2.4.3) was integral to the success of this study.

The next section briefly reviews the literature on middle schooling, particularly for the way it has given shape and direction to the current study.

2.7 Middle Schooling

This section briefly identifies and discusses the literature and issues that have underpinned the development of middle schooling over the last 10 years. Because middle schooling is relatively new on the educational horizon, the majority of interest, dialogue, research and provision that has begun to transform the educational landscape has occurred over the last decade. This section discusses the main developments in Australia that have placed middle schooling squarely on the educational agenda, and outlines key issues that surround this distinctive and important phase of the educational continuum.

Middle schooling has been the object of considerable academic, educational and government attention in Australia over the last decade. Concerns about the learning of students between the ages of 10 and 15 years, who currently find themselves in either primary, secondary or middle schools, prompted the National Middle Schooling Project (NMSP), which was funded by the Commonwealth Department of Education,

Employment, Training and Youth Affairs (DEETYA) and was managed by the Australian Curriculum Studies Association (ACSA). Specific areas of investigation of this national initiative were the assessment of the level of disinclination, attendance, retention, numeracy and literary achievement in young adolescents, in an attempt to determine key aspects of education that best suit the psychological, emotional, intellectual and broader educational needs of students between Grades 6 and 9.

The findings of the NMSP have supported much of the eclectic scholarship that has already been undertaken into middle schooling in Australia (Earl, 2000; Eyers, Cormack & Barratt, 1993; Cormack, 1996a, Cumming, 1994; Hargreaves & Earl, 1990, 1994; Hill, 1995, 1999; Lounsbury & Clarke, 1990). Fundamental to adequate provision for adolescent education is the acknowledgement of the following specific physical, emotional and cultural needs that are synonomous with adolescence and that require educational provision in the middle years of schooling:

- Identity — an acknowledgement of the importance of individual and group identities that are shaped by social and cultural groups.
- Relationships — creating an environment where productive and affirming relationships can develop between peers and adults.
- Purpose — providing opportunities for critical and independent thought.
- Success — creating an environment where students use their innate talents to experience and be recognised for achievement.
- Rigour — being exposed to educational experiences characterised by high expectations and constructive feedback.
- Safety — learning in an environment that is demonstrably caring and safe, free from the anxieties associated with discrimination and harassment.

Based upon these contextual needs of adolescents and 10 forums in Australia held between 1996 and 1997, a list of educational principles regarded as essential components in middle schooling have been endorsed by the NMSP in order for the

most effective provisions for adolescent education to be made. The main principles include:

- A learner-centred curriculum, which is focussed on student needs and interests, with an emphasis on self-directed and constructivist learning.
- Collaborative organisation, with teams of teachers working with students to develop strong relationships and with students being challenged and supported.
- Outcome-based programs, for which progress and achievement are mapped against student expectations and ability.
- Ethical awareness of justice, as respect and concern for others are reflected in the daily interaction and practice of teachers, administrators and students.
- Community orientation, which involves productive partnerships with organisations and identities beyond the school.
- Adequate resourcing to ensure high-quality teachers, families, technology, equipment and materials.
- Strategic links to this discrete phase of schooling within an R to 12 consortium.

In the Australian context, there has been much recent interest and energy devoted to improving the experience of adolescents in schools. This has been supplemented by various fields of scholarship that have sought to understand more deeply the context of the middle schooling debate in this country. That this phase of schooling is of contemporary concern is attested to in recent publications on issues relevant to middle schooling (Cormack, 1996; Cumming, 1996a, 1996b; Groome & Hamilton, 1995; Queensland Board of Teacher Registration, 1996), aspects of literacy and numeracy in the middle years (Hill, 1995), attendance and retention (Dwyer, 1996), resources for middle schooling (Prescott, 1995), and middle schooling issues overseas (Lipsitz & Felner, 1997; Stewart & Nolan, 1992). Intensive discussion and commentary associated with key reports and forums have also been the object of much attention for the way in which they could affect whole-school reform in Australia, with particular

reference to acute reform in the education of adolescents (Barratt, 1998; Cormack, Johnson, Peters & Williams, 1998).

The current study aimed to shed further light on the critical area of adolescent education. Specifically, it aimed to trace student perceptions of classroom environments as they move between the traditional divide of primary and secondary schooling. A new classroom environment instrument — the Middle School Classroom Environment Indicator (MSCEI) — was developed and administered to a medium-size sample of students in schools in South Australia against a debate that exhorts the need for learner-centred curricula, high-quality relationships between teacher and learner, an increasing need for personal autonomy and independence, and a sense of belonging and identity to avoid alienation and depersonalisation in the schooling system. This context has provided shape and direction to the present study.

2.8 Summary of the Chapter

This chapter has discussed the origin and development of classroom environment studies together with theoretical principles that have underpinned and supplemented this rich field of educational research over the last 50 years. Beginning with Lewin and Murray's early work in the 1930s, and supported by Moos' important conceptual contribution (1973), classroom environment research has become an expansive field of academic activity in primary, secondary and tertiary settings in many countries throughout the world.

Classroom environment research is fundamentally aimed at informing teachers, administrators and researchers about aspects of educational environments that either assist or impede cognitive and affective learning. Using a range of instruments that have applications at all levels of the educational spectrum, classroom environment studies have revealed that there are often differences between student perceptions of

their preferred environments and those actual environments to which they are exposed on a daily basis. These differences have not only been shown to affect student achievement in the cognitive and affective domains but, through strategic intervention by the teacher, change and improvement to the classroom environment can be made. Important developments in the field of classroom environment research include the development of efficient and accurate short forms of selected questionnaires to assist teachers in assessing and effecting change to the environment. While this provides considerable potential for teachers to monitor and calibrate classrooms to accord with students' perceptions of ideal environments, it offers a means by which to systematically critique classroom environments and tailor educational experiences to the contextual needs of students.

This review has also discussed a range of issues implicit to classroom environment research, including evaluation of curriculum innovations in the United States, Australia, Canada, Israel, Korea, and Holland, person-environment fit studies that have attempted to assess whether students achieve better in their preferred environment, and investigations of determinants of the learning environments, such as teacher characteristics, gender and family background. These studies not only indicate the versatility of classroom environment instruments beyond investigating the nature of the environment and associations between classroom environment outcomes, but suggest that the information gained from such research can be used to inform educators about influences that impact on students' perceptions of the environment.

Recent cross-cultural studies reveal the importance of socio-cultural context in understanding educational environments and the impact that they can have, both implicitly and explicitly, on the nature of the teaching process, including assumptions about epistemology and methodological practice, as well as on student learning outcomes.

From this review, it is concluded that there has been a relative paucity of learning classroom environment research conducted into classrooms in upper primary and lower secondary schooling , which is specifically aimed at measuring students' perceptions of their environments during the transition from primary to secondary schooling. This is strange at a time when much effort is being directed towards addressing the ostensible inadequacies of middle schooling arrangements, with school experiences for adolescents being seen to be disengaging and alienating. This study is somewhat distinctive in that it used a new instrument — the Middle School Classroom Environment Indicator (MSCEI) — with a group of students who faced transition in a variety of school contexts, and it utilised qualitative-data gathering techniques in order to interpret findings from the quantitative data. This study aimed to add depth to the debate on middle schooling and offer an assessment of the educational experiences faced by students in transition in selected schools in South Australia.

CHAPTER 3

Methodology

3.1 Introduction

The present study involved a longitudinal analysis of classroom environments in Grade 7 and Grade 8, respectively. In order to measure specific dimensions of classroom environment that could change across transition, a new instrument, entitled the Middle School Classroom Environment Indicator Questionnaire (MSCEI), was developed and administered to schools chosen for the study. In addition, qualitative research involving classroom observation and discussions with students, teachers and administrators was undertaken at distinctive and strategic phases in order to extract information about the nature of classroom environments of Grade 7 and Grade 8.

This chapter describes the research methodology used in this study and includes a description of the sample (Section 3.2), a brief overview of the development of the Middle School Classroom Environment Indicator Questionnaire (MSCEI), the process of data collection employed (Section 3.3), and the qualitative methodological principles and data gathering technique employed in this study (Section 3.4).

3.2 Sample

The study was undertaken in South Australia with a sample of students who moved from Grade 7 in primary school to Grade 8 at secondary school. The sample available at the time of pretesting consisted of 311 students in 16 Grade 7 classrooms in six

primary schools. This group of 311 Grade 7 students was followed through when they entered 26 classrooms in six schools in Grade 8. Five of the six schools in the research sample had primary and secondary classes in the same school, so the research aimed to assess perceptions of classroom environment as students moved between different levels of the same school. Only one school terminated enrolment at Grade 7 as a 'primary school' with students moving to a new 'secondary school' at Grade 8 (see School F in Table 3.1). It was this sample of 311 students which was used for investigating changes in classroom environment across transition.

At the secondary school level, these 311 students from primary schools were joined by other students, making a total of 575 students in 26 Grade 8 classrooms. This larger group of 575 was used for analyses involving validation of the new classroom environment questionnaire. The schools represented different enrolment profiles and distinctive settings. The schools involved were two single-sex boys' schools, one single-sex girls' school and three co-educational schools, all of which are in the metropolitan area of Adelaide (see Table 3.1).

The total enrolment of the 16 classes in Grade 7 was 403 students. When the pretest was administered in the closing weeks of the year, a number of students were absent from school. When the posttest was administered mid way through the following year, some students who had undertaken the pretest were also absent from school and did not complete the posttest. Therefore, only the 311 students who completed both the pretest and the posttest administration of the MSCEI formed the sample for this study, even though the total enrolment for the pretest and the posttest is higher (see Table 3.1).

The sample was deliberately chosen to incorporate different management frameworks for students during the 'middle years'. Two schools, one Catholic and one State school, utilise traditional methodologies consistent with primary and secondary classrooms (School E and School F; School F is the only school where students move from a primary school with a Reception to Grade 7 enrolment to a new secondary

school with a Grade 8 to Grade 12 enrolment to secondary school). These two schools provide predominantly classroom-based generalist teaching in Grade 7 and specialist/multiple teachers in Grade 8. One school employed co-operative and specialist teaching arrangements in Grade 7 (School C) in order to graduate the transition to rapid lesson turnover and subject specialisms in the secondary. Two schools adopted different approaches to middle schooling, clustering teachers across Grades 6 to 9 to work cooperatively with students as they progressed from one year to the next (School A and School B), although there are quite some differences in school context and the parent and student clientele. Despite the adoption of the middle schooling philosophy, both of these schools provided quite distinct teaching and learning arrangements that condition quite different classroom environments. The final school involved in the sample (School D), although quite traditional in its framework for managing students in transition, uses the principles of constructivist learning across Grades 6 to 10 by undertaking the Primary Years Program (PYP) in upper primary and the Middle Years Program (MYP) in junior secondary. While constructivist learning environments have been the object of specific research in recent years (Taylor, Dawson & Fraser, 1995), they were subsumed within the current study and were not the focus of particular analysis or research. A summary of the respective school samples is provided in Table 3.1.

The average size of the classes across all schools in the sample did not vary much, and there was little difference in the number of students in each class at Grade 7 and Grade 8.

A more detailed description of the framework of each school can be found in Chapter 5, which integrates quantitative data with the results of the qualitative analysis. For the six schools involved in the sample, different enrolment profiles and distinctive frameworks for managing students in transition between Grade 7 and Grade 8 were integral to this study.

In the pretest application, 311 students from 16 classes in Grade 7 responded to the MSCEI, while 575 students from 26 different classes from Grade 8 responded to the posttest. This represents a reasonable size sample with which much analysis could be undertaken, although by no means as large as other studies which have been conducted into classroom environment research in recent times (Chionh & Fraser, 1998; Tock, 1995).

Table 3.1
Information About the Six Schools Involved in the Research Sample

School	Nature of enrolment	Grade 7 enrolment	Grade 8 enrolment	Structural characteristics
A	Single-sex boys	70	136	Middle school arrangements
B	Co-educational	60	118	Integrated unit
C	Single-sex girls	72	137	Cooperative teaching model (Grade 7)
D	Co-educational	60	120	Constructivist classrooms
E	Single-sex boys	86	155	Traditional model of schooling
F	Co-educational	58	121	Traditional model of schooling (Reception to Grade 7 on primary school site. Grade 8 to Grade 12 on different secondary school site)
Total enrolment *(a)*		403	785	
Total in sample *(b)*		311	575	

(a)= Total number of students in classes

(b)= Number of students who were present at school and responded to the MSCEI

3.3 Quantitative Data

The following section discusses the genesis of the Middle School Classroom Environment Indicator (MSCEI) and the methodology associated with its application. This includes the purpose of the instrument and its content (Section 3.3.1), the rationale for using actual and preferred forms (Section 3.3.2), the importance of personal vs class perceptions classroom environments (Section 3.3.3), the involvement of a Grade 7 student reference group to assist in instrument development and refinement (Section 3.3.4), field testing of the instrument (Section 3.3.5), the process of administering the questionnaire (Section 3.3.6), and the timing of the pretest and posttest administrations (Section 3.3.7).

3.3.1 Middle School Classroom Environment Indicator

The Middle School Classroom Environment Indicator Questionnaire (MSCEI), is a purpose-specific questionnaire designed to measure psychosocial dimensions of the classroom environment in upper primary and lower secondary levels/classrooms (see Appendix A, Appendix B, Appendix C and Appendix D). While the MSCEI was specifically designed to measure perceptions of classroom environment at Grade 7 and Grade 8 in this study, the simplicity of the questionnaire and its easy application opens the possibility of using it throughout the middle secondary years, including Grades 8, 9 and 10. A full description of the development and validation of this instrument is contained in Chapter 4, but aspects of the questionnaire insofar as they relate to the methodology employed are summarised in this section.

The original version of the MSCEI (Actual) contained nine scales with six items in each scale. The scales were *Difficulty, Affiliation, Communication, Autonomy, Student Cohesion, Teacher Support, Cooperation, Task Orientation* and *Involvement.* Each scale has a five-point response alternative including *Strongly Agree, Agree, Can't Decide, Disagree, Strongly Disagree.* When the MSCEI was subjected to item and

factor analyses following the pre-transition administration, it was reduced to seven scales containing between four items and six items per scale, aggregating to 33 items for the whole instrument.

Assumptions were made in Grade 7 (subsequent to discussion with a reference group of students) that the classroom environment remained relatively constant across different primary school subjects, as most students have one teacher for the majority of their subjects and are based in the one room. Qualitative data gathered indicated that a number of schools employ specialist teachers for music, physical education and art, but that these are very often not in the classroom where the bulk of teaching and learning takes place. Accordingly, the Grade 7 version of the instrument (both actual and preferred forms) did not differentiate between subjects as it assumed that the classroom environment remained relatively constant.

Because most students were exposed to multiple teachers and subject specialist methodology in Grade 8, it was believed important to extract information about specific subject areas in the posttest. For that reason, students were asked to complete actual and preferred versions of the MSCEI based upon perceptions in English and Mathematics classes. These subjects were likely to involve different teachers, different classroom methodologies and different classroom environments in Grade 8. Accordingly, the instrument was constructed to elicit information based upon a singular perception of classroom environment in Grade 7 and two subject-specific environments in Grade 8 (see Appendix B and Appendix D). These hold important implications for analysis and interpretation (see Chapter 5).

3.3.2 Student Satisfaction Scale

An extra scale — *Satisfaction* — was incorporated as an outcome variable. Because particular aspects of the environment had been selected on the basis of their salience to

middle schooling (see Section 4.2.1 and 4.2.2), it was believed important to measure students' level of satisfaction in Grade 7 and Grade 8, respectively. Items incorporated into *Satisfaction* as an outcome indicator in the actual form were worded in similar fashion to the classroom environment items (e.g. "Being in this class is enjoyable" and "Students look forward to coming to class" – see Appendix B and Appendix D). *Satisfaction* was analysed as a dependent variable to see if students perceived a greater overall degree of contentment with their classroom experiences in Grade 7 as opposed to Grade 8 classes. Satisfaction was subjected to statistical analysis with other classroom scales to determine whether the prevalence of certain dimensions of classroom environment is associated with higher levels of student Satisfaction (see Section 5.4).

3.3.3 Actual and Preferred Forms

In addition to the actual version of the MSCEI, a preferred version was devised and administered at both phases of the data collection. The preferred forms are provided in Appendix A and Appendix C. Past research using actual and preferred forms has aimed to elicit information about the congruence (or lack thereof) between ideal and actual environments in selected scales (Fraser, 1982b, 1983b; Fraser, 1984; Raviv, Raviv & Reisel, 1990). This holds potential for interventions to occur in order to condition greater symmetry between preferred and actual environments (Fraser & Fisher, 1986; Thorp, Burden & Fraser, 1994; Yarrow, Millwater & Fraser, 1997). While the object of this study was not to provide modifications to the learning environment either in Grade 7 or Grade 8 classrooms, the degree of change in classroom environments between Grade 7 and Grade 8 was considered important both in terms of the actual environment and the discrepancy between actual and preferred environment (see Section 2.5.3). Because the actual version of the MSCEI was altered as a result of item and factor analyses, as described in Section 4.9, the preferred version was modified accordingly so that actual and preferred forms of the MSCEI would assess the same scales and items of classroom environments. Examples of the scale

items that were modified and used in the actual and preferred versions of the MSCEI are contained in Table 4.3.

3.3.4 Personal vs Class Perceptions of Grade 7 and Grade 8 Classes

The relative merits of using an instrument that would measure personal as distinct from class perceptions of the environment were considered at length. The advantage of using a questionnaire that elicits information about personal views of the classroom is that it enables a more highly individualised and less detached response for each of the scales contained in the instrument (Fraser, Giddings & McRobbie, 1995). This was believed to offer a more parsimonious and discerning view of particular dimensions of classroom environments in Grade 7 and Grade 8 (see Section 3.3.1). Over the longitudinal study, students were asked to respond individually to their perceptions of three distinct classroom environments – Grade 7, Grade 8 Mathematics and Grade 8 English classrooms. The use of the personal form was intended to provide more subjective and less detached perceptions of the environment which would engender more precise understanding of the transition experience and perceptions of the classroom environments for the students involved in the study (see Section 4.4).

3.3.5 Student Reference Group and Questionnaire Design

Questionnaire development and validation are outlined in greater detail in Chapter 4. Methodologically, however, it was important to formalise salient aspects of the classroom environment pertinent to middle schooling that could be subject to alteration across the transition from Grade 7 to Grade 8. To that end, past research on middle schooling (Cormack, 1996a, 1996b; Cumming, 1996a, 1996b; Eyers, Cormack & Barratt, 1993; Hargreaves & Earl, 1995; Lounsbury & Clarke, 1990) and middle school classroom environments (Feldlaufer, Midgley & Eccles, 1988; Ferguson, 1996) guided

the selection of scales that were incorporated into the questionnaire. It was believed important, given past research, to include scales which specifically addressed dimensions and student perceptions of Affiliation, Autonomy, Involvement, Task Orientation, Teacher Support and Student Cooperation, all of which are allegedly affected by the transition to secondary school (see Sections 2.6 and 2.7).

A reference group of Grade 7 students was chosen from one school. Two separate discussions were held to determine student perceptions of the salience of these dimensions of their classrooms. The discussions were recorded and reviewed in relation to the scales chosen for preliminary inclusion in the questionnaire. This preliminary fieldwork is methodologically similar to that undertaken by Fraser and Tobin (1991) who selected classroom environment dimensions *after* a certain amount of fieldwork had been undertaken. The wording of the scales was calibrated in order to embrace items that the reference group believed to be important and relevant indicators of classroom environment, *before* proceeding with the initial try-out the instrument. This is discussed further in Section 4.4.1 and Section 4.4.2.

3.3.6 Field Testing of the Instrument

Following discussions with the reference group of students from Grade 7 in one of the schools, the instrument was assembled containing nine scales and six items for each scale. A sample of 12 students from one of the schools was selected to respond to the MSCEI to see if the questionnaire provided difficulty for the students, either in the administration of the instrument or with regard to the comprehensibility of items in the questionnaire. Given the previous research using the MCI in primary classrooms (Fisher & Fraser, 1981; Fraser, Anderson & Walberg, 1982; Fraser & Deer, 1983), caution needed to be exercised so that the items were worded simply and so that the questionnaire was not too long or difficult so as to preclude accuracy of response from primary school students. The other important aspect of the fieldwork was to measure

the length of time it took students to complete both the actual and preferred versions of the MSCEI.

During the field testing stage, as the researcher, I was concerned not to provide too much detail because the questionnaires would need to be self-explanatory and provide as few obstacles as possible for the administrators, teachers and students to be involved in the main study.

Following completion of both the actual and preferred versions of the MSCEI, which took approximately 12 minutes, discussion was held with the 12 students who responded. An evaluation was held immediately after the trial in order to see if difficulties had arisen in answering the instrument or whether queries or issues stemming from the questionnaire were apparent. The objective of the discussion was to elicit further information from the students' perspective about the questionnaire so that any problems that were encountered would not be forgotten or lost in the days in between administration and follow-up.

There were some slight adjustments to the wording of the questionnaire based upon the field trial. These are outlined in Section 4.3. Some scale items were rephrased in order to enhance readability and comprehensibility so that they could be more easily interpreted and understood by all students. There were some changes to the nine scales associated with dimensions of the classroom environment.

3.3.7 Process of Administering the MSCEI

Contact with each of the schools involved in the sample was made weeks before the administration of the questionnaire. Because samples of students from both Catholic and State schools were involved in the research, permission from the respective authorities responsible for each system needed to be forthcoming before approaches

could be made to principals and administrators of the various schools that had been chosen for the study. In addition, because this study involved qualitative data gathering, which included classroom observation and discussion with teachers and students, much preliminary work had to be undertaken prior to administration of the questionnaires.

Teachers and administrators involved in the sample were very supportive of the research and were keen to be of assistance in facilitating the administration of the MSCEI. As the researcher, I was keen to point out key issues about the research to administrators in schools, which included:

- The purpose of study.
- The need for honest perceptions of the classroom environment at Grade 7 and Grade 8.
- Student confidentiality, which would be respected and maintained.
- Instructions about how to answer the questionnaires. These were to be presented to the students by either the class teacher or the administrator in each school that was responsible for conducting the application.

Because both forms of MSCEI could be completed in a relatively short period of time, no extra provision of time needed to be made for the survey in the classes selected for the research.

The same process was used in the post-transition phase of the research; key administrators and teachers were asked to administer the questionnaires at the classroom level to ensure that all aspects of the study and questionnaires were understood. I did not feel it necessary to undertake the administration of the MSCEI personally if the framework of the study was clear to teachers and administrators and the questionnaires were straightforward. The issue of students giving honest responses to items involving Teacher Support and other possible areas of contention was not

considered as important as the issue of confidentiality, which was to be stressed at all points of the quantitative data collection process.

3.3.8 Timing of Pretest and Posttest Administrations

The longitudinal nature of this study required defined data-gathering phases prior to the transition into secondary school, and after sufficient time had elapsed that allowed students' perceptions of classrooms in secondary school to be formed and assessed. While timing of quantitative data gathering is always a problematic exercise, it was believed important to administer the pretest late in the year in Grade 7 and mid-way through the subsequent year in Grade 8. The researcher decided that it was valid to administer the MSCEI late in the year in Grade 7, at a time when students had definite and clear perceptions about their classroom, teacher and schooling environment, and when many of them were reflective about their primary schooling and the transition to secondary school that they were about to face. This is particularly the case for a number of students who were leaving one geographical site which contained a Reception-to-Grade 7 enrolment and entered another campus with Grade 8-to-12 enrolment. It was also believed valid to allow six months to elapse in secondary school before the post-transition administration of the MSCEI, at a stage when students had time to experience and adjust to the different classroom environments in the secondary school.

Other aspects of the pre-transition and post-transition administration of the questionnaire included assumptions about schooling structures and classroom environment (Section 3.2), the school subjects for which the post-transition perceptions would be gathered (Section 3.3.1), and the validity of scales used at both stages of the transition process (Section 3.3.4). These are explained in greater detail in Section 4.3.

3.3.9 Quantitative Data Analysis

Quantitative data were processed at two distinct phases. In the first instance, the reliability and validity of the MSCEI, as a new classroom environment instrument, needed to substantiated. This involved a number of statistical analyses for the actual form described in detail in Chapter 4, including factor structure (Section 4.9.1), alpha reliability (Section 4.9.2), discriminant validity (Section 4.9.3), and ANOVA results (Section 4.9.4) for the ability to differentiate between classrooms. Alpha reliabilities and discriminant validity for the preferred form are described in Section 4.9.5.

These validation analyses were supplemented by calculation of the mean and standard deviation to provide descriptive statistics for the pretest and posttest administration of the MSCEI for both the actual and preferred versions of the questionnaire. Statistical interrogation of data collected using the instrument revealed satisfactory validity, thus justifying proceeding with the second stage of data analysis and interpretation of the quantitative data (Chapter 5).

3.4 Qualitative Data

Qualitative data, as discussed in Section 2.5.11, has the potential to provide more detailed information gathered through classroom observation and discussion with the milieu participants. The propensity to bring both forms of data gathering together for developing more complete understanding of classroom dynamics in recent times (Aldridge, Fraser, Taylor & Chen, 2000; Aldridge, Huang & Fraser, 1998; Fraser & Tobin, 1991; Tobin 1987; Tobin & Fraser, 1987, 1990; Tobin & Gallagher, 1987a; Tobin & Malone, 1989) has yielded important insights into perceptions of classroom environments and has enabled more effective interpretation of quantitative data.

Qualitative data were gathered in three separate stages in this study, namely, during questionnaire development, pre-transition, and post-transition. Primarily, participant observation methods advocated by Erickson (1986) were employed involving classroom observations, interviewing teachers and administrators, and talking with the students themselves. During the pretest qualitative data-gathering phase, notes were typed up and sent to teachers for their comment and/or constructive criticism. This process enabled a rich source of data to be extracted from the schools involved in the study and was used extensively (see Chapter 6) to explain individual school experiences for the students across transition. This section describes the use of a reference group of students to detect the salience of classroom environment scales (Section 3.4.1), the method of school visitation to observe classroom environments in Grade 7 (Section 3.4.2), and the process of classroom visitation and observation used after students had moved into secondary school (Section 3.4.3).

3.4.1 Student Interviews to Determine Salience of Classroom Environment Scales

This study was distinctive in its attempt to use a reference group of students in Grade 7 to identify salient aspects of their classroom environment which could form the basis of the instrument used to measure aspects of change across transition (Section 4.2.1). Rather than present an amalgam of scales used in previous instruments in the hope that scale selection would be valid for the middle years of schooling, a deliberate attempt was made to assess features of classroom environments that had been identified as important by the students themselves. While these discussions were useful in guiding the design of the instrument, they also assisted in the collection of qualitative data during the visits to schools in the pretest and posttest phases.

Two separate discussions were held with the reference group of 12 students, who talked openly about preferred aspects of their environment, such as the level of teacher

support and student cooperation, as well as some preferred aspects of their environment that were not viewed as favourably, such as the difficulty of work. These discussions were audio-taped, transcripts were produced, and these transcripts were analysed for particular characteristics of the classroom environment that were regarded as important to the students. This process, which is explained in detail in Section 4.2.1, contributed in a distinctive way to the formation of the questionnaire and the research format adopted in this study.

3.4.2 Classroom Observation Prior to Transition

Each school involved in the study was visited on two occasions while students were in Grade 7. Two lessons were observed with notes taken that recorded the physical features of the classroom, the structure of the lesson, teacher methodology, student responses and the general characteristics of the learning environment that were established in the room. In total, some 24 hours of classroom observation were undertaken by the researcher during the pre-transition phase with a body of data gathered that could best be called 'thick description' of the events that transpired in classrooms of the six schools that formed part of the research sample. Qualitative data were believed to be particularly important in this study to see if particular types of methodologies and emphases at the classroom level produced observably different environments, as well as whether particular structures that were developed at the school level to assist students in transition could explain the results from the quantitative data. It would be important to suggest, at this early point, that cooperative teaching arrangements and peer-assisted learning modalities did engender different classroom environments in some schools that were part of the research sample, as distinct from other schools which provided more traditional teaching and learning environments.

In addition to classroom observation, discussions were held with both students and teachers about aspects of the classroom environment together with school structures

that had been devised to best manage the transition from primary to secondary school. In every school chosen for the research, students in Grade 7 were either moving to a different geographical section of the property as they entered the secondary school in Grade 8 or, in some cases, to an entirely different secondary schooling setting. These discussions were valuable as they offered insight into the provision that was being made by the school to assist students in the transition between upper primary and lower secondary schooling. In every school involved in the research, there was an acute awareness of the fact that students were leaving a more secure environment of the primary school and entering a subtly different educational regime in the secondary school.

Classroom observations and discussions with students, teachers and administrators produced a rich source of data that was compiled and triangulated against quantitative findings in Chapter 6.

3.4.3 Classroom Observation After Transition

As was the case for the pre-transition qualitative data-gathering phase, each school was visited on two occasions towards the end of Semester 2 in Grade 8. The visits were coordinated with the timing of the questionnaire application so as to explain the process of questionnaire application to teachers and administrators, many of whom had not formed part of the pre-transition data collection, as well as to observe the classes into which students had moved at the Grade 8 level. The same process of data collection, involving the physical features of the classroom, lesson content, teacher methodology, student responses and the general character of the learning environment from the standpoint of the observer, were recorded. In the post-transition phase, discussions were also held with students in transition as well as teachers and administrators in Grade 8. In total, some 20 hours of classroom observation was undertaken in the post-transition phase, and this produced another important source of qualitative data with which to cross-reference with the quantitative data gathering and data analysis.

3.5 Summary of the Chapter

This chapter described the sample involved in the study, the instrument used in the quantitative data-gathering phase, the process used to ensure the effective administration of the instrument, the timing that was strategically chosen for data collection, and qualitative aspects of data collection. In the first phase of data collection, there were 311 students in 16 different Grade 7 classes which formed the research sample. In the second phase of the longitudinal study, these 311 students were followed into secondary schools where they joined other students to form a group of 575 students in 26 classes in Grade 8. The instrument used in this study was designed specifically for use in this research and was titled the Middle School Classroom Environment Indicator (MSCEI), which assesses scales believed to be particularly salient in upper primary and lower secondary classrooms.

Following preliminary testing of the MSCEI, the questionnaire was administered at two distinct phases, namely, at the end of Grade 7 and six months later when students were approximately half way through Grade 8. The application of the questionnaires was augmented by qualitative data gathering involving classroom observation and discussions with students, teachers and administrators both before and after transition.

Student responses to the classroom environment questionnaire provided the main source of data, which is discussed in context of aggregated findings in Chapter 5. Triangulation of qualitative data against individual school's profiles of quantitative questionnaire results is reported in Chapter 6.

The next chapter describes in detail the development and validation of the Middle School Classroom Environment Indicator together and its use in this study.

CHAPTER 4

Questionnaire Development and Validation

4.1 Introduction

The Middle School Classroom Environment Indicator (MSCEI) was developed to assess psychosocial features of the classroom environment in upper primary and lower secondary grade levels. As the purpose of this study was to measure whether changes in the classroom environment are perceived by students as they make the transition between primary and secondary school, a new instrument was required to elicit information pertinent to upper primary and lower secondary classrooms. The MSCEI was developed over a number of months and involved interviews with students, discussions with colleagues, application of ideas from the literature, and field-testing and refinement of a draft version of the instrument. Because this was a longitudinal study, the MSCEI was administered on two occasions, initially in Grade 7 before students made the transition to secondary school, and after six months of experiencing the classroom environment in Grade 8.

This chapter outlines the validation process used for the Middle School Classroom Environment Indicator (MSCEI). In the early section, discussion focuses on the origin of the instrument (Section 4.2), the scales and items identified for use (Section 4.3), the use of the Personal rather than the Class form (Section 4.4), the use of both actual and preferred forms (Section 4.5), and field testing that led to the refinement of the instrument (Section 4.6). The latter stages of this chapter discuss the statistical analyses of the MSCEI data including validity and reliability, refinement and factor

structure, discriminant validity and the ability to differentiate between classrooms. In addition to the discussion associated with design and development of the questionnaire, tables are presented that provide evidence about particular statistical aspects of the scales and items used in the instrument.

4.2 Questionnaire Development

The development of the Middle School Classroom Environment Indicator (MSCEI), a purpose-specific questionnaire designed for the present study, was based on interviews with Grade 7 students, existing questionnaires and literature associated with middle schooling. Section 4.2.1 describes the student interview process used with students for the purpose of articulating key aspects of the classroom environment that became the object of research. Section 4.2.2 outlines previous classroom environment research that utilised scales which became incorporated into the MSCEI. Section 4.2.3 briefly outlines some of the broader research on middle schooling that influenced the development of the MSCEI. Tables are also presented in this section that display particular aspects of the instrument design, application and validation. Table 4.1 describes the use of scales in previous instruments and their relationship to Moos' typology for perceptual measures of human environments, while Table 4.2 presents descriptive details about the scales and scale items used in the questionnaire. Table 4.3 provides examples of the difference between actual and preferred versions of the questionnaires.

Table 4.1
Scales of the Middle School Classroom Environment Indicator (MSCEI) Used in Previous Classroom Environment Research

MSCEI Scale	Existing Ennvironment Instrument	Classification According to Moos' Typology
Difficulty	Learning Environment Inventory My Class Inventory	Personal Development
Autonomy	Individualised Classroom Environment Questionnaire What is Happening In This Class Questionnaire	Personal Development
Task Orientation	Classroom Environment Scale College and University Classroom Environment Inventory What is Happening In This Class Questionnaire	Personal Development
Affiliation	Classroom Environment Scale	Relationship
Cooperation	What is Happening In This Class Questionnaire	Relationship
Communication	Not used in previous research	Relationship
Student Cohesiveness	Learning Environment Inventory My Class Inventory College and University Classroom Environment Inventory What is Happening In This Class Questionnaire	Relationship
Teacher Support	Classroom Environment Scale What is Happening In This Class Questionnaire	Relationship
Involvement	Classroom Environment Scale College and University Classroom Environment Inventory What is Happening In This Class Questionnaire	Relationship

4.2.1 Student Interviews

The genesis of the MSCEI is attributable partly to a reference group of students who were interviewed at length about their existing classroom environment in Grade 7 (which is the final year of primary schooling in South Australia), together with the expectations that they held for the anticipated environment in Grade 8 (which represents the beginning of secondary schooling). This is traditionally regarded as something of a juncture point in the formal schooling process, as students leave the relatively insular and self-contained environment of primary school classrooms to enter the subject specialist teaching arrangements and integrated timetables associated with the secondary school. The discussions were recorded and transcripts were produced, and this formed the basis for scales and scale items pertinent particularly to the middle years of schooling as indicated by the milieu participants at the Grade 7 level. Students were asked to reflect on some of the changes that were already apparent as a result of moving into the upper primary years, with a view to anticipating further changes that were likely to be experienced in the lower secondary school. In reflecting on some of the obvious changes experienced between Years 6 and 7, respectively, students revealed:

> *You don't have as many restrictions placed upon you (inside the classroom). We don't have as many rules (e.g. as long as we make our way to the library, how we do it is our decision).*

Extended discussions of this kind revealed that students are increasingly exposed to, and have a developing predilection for, independence and autonomy. A decision to include an Autonomy scale was subsequently reached.

Similarly, comments related to the role of the teacher, peer influences and other salient psychosocial features of the learning environment were to find expression in scales related to Teacher Support, Student Cohesiveness, Cooperation and others that

ultimately comprised the MSCEI. When discussing the nature of classrooms, students in Grade 7 indicated that their class held a real identity to which they felt a distinct sense of belonging. While this might not have been universally shared, it seemed valid to tap the degree to which students felt part of a distinct unit, when later compared to student perceptions of belonging in Grade 8, and how the degree of belonging at the classroom level had been influenced by the transition from primary to secondary schooling. Similarly, the item *I feel safe in this class* in the Affiliation scale is a direct quote from a student who formed part of the reference group. A sense of security, be that emotional, physical or psychological, was an issue that was identified by one student and strongly endorsed by others who were part of the original discussions. A scale item of this kind had not formed part of classroom environment questionnaire previously, but its salience as an indicator of middle school classroom environment could not be ignored. It became subsequently included in the Affiliation scale as a psychosocial indicator of classroom environment.

It is therefore important to emphasise the methodological origin of the MSCEI. At the outset, a concerted effort was made to identify from the participants themselves the features of their existing classroom environment which were deemed to be significant. In the eyes of the reference group, some of these dimensions caused satisfaction and enjoyment (Teacher Support) while others were perceived as causing hardship and anxiety (Difficulty).

The reference group itself was carefully selected from one of the schools chosen for the research to include students from a variety of classrooms so that one set of classroom experiences was not disproportionately represented. Students of varying ability levels were selected in order to develop a questionnaire that aimed to be inclusive and broadly representative of the cohort of students who were the objects of research. It was assumed that the scales which formed the substance of discussion with the reference group would be typical and representative of classroom perceptions

and experiences of Grade 7 students across South Australia, particularly as they face the transition from primary to secondary schooling.

There were two separate discussions held with students of the reference group in order to elicit key aspects of the classroom environment that were perceived as being important. A number of dimensions of the environment were identified, including Teacher Support, Student Cohesiveness and Difficulty, which loomed as key features of the classroom that should form the basis of the instrument which would assess and measure key perceptual changes across transition.

4.2.2 Previous Research

Of the nine scales originally selected for the MSCEI, eight have been used in past research as indicators of psychosocial features of classroom environment, some particularly at the upper primary and lower secondary levels (Feldlaufer, Midgley & Eccles, 1988; Ferguson & Fraser, 1996; Fisher & Fraser, 1981; Fraser, Anderson & Walberg, 1982; Moos & Trickett, 1974; Trickett & Moos, 1973). Because these scales already are established and statistically validated as relevant and effective measures of human environments, it was useful to draw on past experience and incorporate, adapt and modify previous scales for this study.

A number of scales used in the MSCEI have been the object of much research in the past. Involvement, Affiliation, Teacher Support and Task Orientation grew out of Moos' study of human environments in psychiatric hospitals, prisons and work milieus (Moos, 1974) and formed scales within the Classroom Environment Scale (CES) (Moos & Trickett, 1974; Trickett & Moos, 1973). The original version of the CES contained 242 items representing 13 conceptual dimensions of the classroom environment, but successive applications and refinement saw the instrument reduced to 90 items representing 10 conceptual dimensions. This instrument has been used to

measure general perceptions of the classroom environment (Fisher & Fraser, 1983; Moos & Moos, 1978; Trickett & Moos, 1974), and to investigate differences between teacher and student perceptions of the classroom environment (Fisher & Fraser, 1983b) as well as whether students achieve better in their preferred environments (Fraser & Fisher, 1983a).

Difficulty was used in the My Class Inventory (MCI) (Fraser, Anderson & Walberg, 1982; Fisher & Fraser, 1981), which was designed specifically for children aged between eight and ten years. While the MCI was developed originally for use in primary school, it has been used successfully with students who might experience reading difficulties with other instruments such as the Learning Environment Inventory (LEI). Independence (Autonomy) was first used in the Individualised Classroom Environment Questionnaire (ICEQ) (Fraser, 1990; Rentoul & Fraser, 1979) to assess differences between individualised and conventional classrooms (Walberg & Thomas, 1972).

Fraser and his colleagues were keen to develop an understanding of student perceptions of practical work in science from a classroom environment perspective (Fraser, Giddings & McRobbie, 1995; Fraser & McRobbie, 1995; Fraser, McRobbie & Giddings, 1993; Fraser & Wilkinson, 1993). They devised the Science Laboratory Environment Inventory (SLEI) which incorporates a scale on Student Cohesiveness, for the express purpose of measuring the extent to which students support each other and cooperate at the classroom level in laboratory classroom settings. Personal and class variations of the SLEI have been developed. The Personal form measures an individual's perception of their own role/response within the class, while the Class form measures an individual's perception of the class as a whole.

A number of the scales comprising the MSCEI have been used in previous classroom environment research. Developed by Fraser, McRobbie and Fisher (1996), the What is Happening In This Class (WIHIC) questionnaire was devised to measure students'

perceptions of their classroom environment. Scales such as Student Cohesiveness, Teacher Support, Involvement, Task Orientation and Cooperation were extracted from existing questionnaires to assess seven key dimensions of the learning environment with a view to bringing further parsimony to classroom environment research. When subjected to initial field-testing (Fraser, Fisher & McRobbie, 1996), 26 of the 90 items were discarded with 54 being retained following statistical analysis. Subsequent testing of the WIHIC (Aldridge, Huang & Fraser, 1998; Chionh & Fraser, 1998: Fraser & Chionh, 2000; Rawnsley & Fisher, 1997) has supported the validity of the instrument for studying science and mathematics classrooms.

While scales used on the MSCEI have been included in various classroom environment instruments and incorporated into different research applications, some have been specifically used to assess classroom environments in upper primary and lower secondary schooling (Feldlaufer, Midgley & Eccles, 1988; Ferguson & Fraser, 1996, 1998). Using three instruments to measure the impact of transition between primary and secondary schools in the United States, Feldlaufer, Midgley and Eccles (1988) compared students', teachers' and independent observers' perceptions of environment dimensions such as Student Cooperation (Interaction), Task Organisation and Teacher Support. Ferguson and Fraser's study (1996, 1998) of 1047 students utilised two instruments to measure differences between classroom environments in primary and secondary schools in Australia. The My Class Inventory (MCI) (Fisher & Fraser, 1981) contains scales of Difficulty and Cohesiveness, while the Questionnaire on Teacher Interaction (QTI) (Wubbels, Brekelmans & Hooymayers, 1991) explicitly measures the degree of teacher support that students perceive that they receive at different stages in transition. Both of these studies involved scales and dimensions of classroom environments that are particularly pertinent to students moving between primary and secondary schooling, and were accordingly adopted and incorporated into the MSCEI.

In selecting the nine scales that ultimately comprised the MSCEI, some scales used in previous research were abandoned as they did not loom as important in the eyes of the students themselves. Scales such as Friction and Competitiveness in the My Class Inventory (MCI) (Fraser, 1993), Integration and Rule Clarity utilised in the Science Laboratory Learning Inventory (SLEI) (Fraser, Giddings, & McRobbie 1995), Student Negotiation, Shared Control and Personal Relevance in the Constructivist Learning Environment Survey (CLES) (Taylor & Fraser, 1991; Taylor, Fraser & Fisher, 1997; Taylor, Fraser & White, 1994), along with a litany of others, were excluded when constructing the MSCEI. The questionnaire needed to be selective and did not incorporate scales that were seen to be of less than maximum relevance or salience to the students who formed part of the reference group, that is, those who were experiencing the important transition between primary and secondary schooling.

Scales in the MSCEI can be classified according to Moos' conceptualisation of human environments. When researching learning environments (Moos & Trickett, 1974; Trickett & Moos, 1973), Moos purported the existence of three related but distinct aspects of human environments: the relationship dimension, the personal development dimension, and system maintenance and system change dimension (see Section 2.2). This important conceptualisation has been used to formulate and interpret much human environment research over the last 25 years and has been used as the basis of a number of classroom environment instruments that have been developed, including the Learning Environmnet Inventory (LEI), the Classroom Environment Scale (CES), the Individualised Classroom Environment Questionnaire (ICEQ), the My Class Inventory (MCI), the College and University Classroom Environment Inventory (CUCEI), the Science Laboratory Environment Inventory (SLEI), the Work Environment Scale (WES) and the Science Laboratory Environment Questionnaire (SLEQ) (see Section 2.1). Table 4.1 displays the scales that comprised the MSCEI, and their deployment in previous research instruments, as well as the scale classification according to Moos' typology on human environments.

The MSCEI incorporated scales of the classroom environment that measure the relationship and personal development aspects of Moos' typology more than the system maintenance and change dimension. It was believed important to assess the impact of transition to secondary school in terms of the way in which it affected the individual and interactional aspects of the classroom, rather than the way in which distinctive aspects of the environment were maintained or influenced by change.

4.2.3 Literature on Middle Schooling

While each scale owes its incorporation into the MSCEI to the student reference group and to previous research into classroom environments, a growing body of scholarly work in the area of middle schooling highlights the need for further research and understanding of this critical phase of education. A number of aspects of class and school environment in upper primary and lower secondary education have been the object of concern, comment and research. This has primarily involved a macro-conceptualisation of the school rather than a micro-conceptualisation of the classroom. Eyers, Cormack and Barratt's (1993) lighthouse work suggests that one of the most significant aspects of middle schooling is the need to provide curriculum experiences and a social setting that allows adolescents to move from a stage of dependence in upper primary school to independence in the lower secondary school. Basing his research on a body of contemporary literature, Eyers re-assembled Hargreaves' earlier work (1990) to codify developmental stages of young adolescents that need to be accommodated at the school and at the classroom level. Among 10 key aspects of middle schooling identified by Hargreaves, the following are particularly significant for the terms of this study:

- Growth towards independence (while still needing security in personal relationships).

- Opportunities to experience decision making, and accept responsibility for these decisions.
- Experience of social acceptance and gaining affection and support among peers of the same and opposite sex.
- The need to establish and maintain stable relationships with particular adults who can provide advice and act as role models.

This research lent further support for the adoption for the present study of scales such as Independence, Involvement, Cooperation, Affiliation, and Teacher Support, all of which formed part of the MSCEI.

Using action research methods and data collection and analysis, Cormack's (1996a) research into middle schooling revealed that considerable alienation is experienced by students at the class and school levels as they traverse the important transition associated with adolescence, leading to a perceived lack of affiliation and belonging. Both of these fields of research implicitly support the inclusion of scales such as Autonomy and Affiliation, respectively. Other scholars have written exclusively on the importance of peer relationships (Hargreaves & Earl, 1990), and hence the relevance of Cooperation and Student Cohesiveness.

Thus, while each scale at the outset was seen to represent important aspects of classroom environment as indicated by the student reference group and previous research, there remains an important body of other research that independently corroborates and influences the selection of the scales that have been incorporated into this study.

4.3 Scales and Items

A set of items was developed for the MSCEI, a number of which had been used extensively in past research. Once the scales were determined, particular reliance was placed on the What Is Happening In This Class (WIHIC) questionnaire (Aldridge, Huang & Fraser, 1998; Fraser, McRobbie & Fisher, 1996; Rawnsley & Fisher, 1997) and the Learning Environment Inventory (LEI) (Anderson & Walberg, 1974; Fraser, 1981b; Fraser & Walberg, 1981; Haertel, Walberg & Haertel, 1981; Randhawa & Fu, 1973; Walberg, 1979; Walberg & Haertel, 1980) which have both successfully been employed in past classroom research.

Considerable revision and modification to the items occurred as a result of comments solicited from colleagues (see Section 4.3.1), through a review of the outcomes of previous research, and through comments made by the students themselves (Section 4.3.2) when presented with a draft questionnaire.

4.3.1 Comments from Colleagues

The precision of wording of items in the MSCEI was greatly enhanced by advice received from colleagues. Preliminary drafts of the instrument did not sufficiently discriminate between the personal perceptions of classroom environment and those related to common classroom perceptions of the environment. Nor was there adequate definition to some of the aspects of the environment that were being sought. For example, colleagues suggested that two items that were originally incorporated into the Affiliation scale, *This class has an identity* and *New students are accepted into this class,* were ambiguous as they did not relate to individual student perceptions of belonging. Both items were revised to form statements that contained a personal view of affiliation, which would avoid confusion about the intention of the scale and avert potential difficulty in collating and interpreting the data. Similarly, in the Difficulty

scale, one item underwent three revisions: *More time could be provided for assignment work* was altered to *I need more time for assignment work* before final acceptance of the statement *I have plenty of time to finish work.* The issue of tests and assignments specifically was picked up in other sections of the scale.

Precise and unambiguous wording of the items was required to allow the student the opportunity to provide his/her response on a five-point scale. This allowed the respondent the opportunity to specify the degree to which they agreed with any given feature of the classroom environment, which required the avoidance of superlatives in the questionnaire items. For example, *I always have plenty of work to do* became *I have time to do my work,* and *I am involved in many important discussions* became *I am involved in classroom discussions.*

The five-point scale, which involved response alternatives of Strongly Agree, Agree, Can't Decide, Disagree and Strongly Disagree, provided the student with a means by which to respond at different levels to each of the propositions contained in the questionnaire.

Advice was also received to modify items that initially sought responses to feelings rather than classroom perceptions. For example, *I feel included in classroom activities* as an item under Affiliation became *I am included in classroom activities,* in order to ensure consistency of questionnaire format and congruence with previous environment indicators.

4.3.2 Comments from Students

It was also important to word each item in the positive to avoid confusion among students. Initially, items in the category of Difficulty appeared as *I find tests and assignments hard* and *New work is not difficult for me.* Because of ambiguity that

became apparent at the preliminary field testing stage (see Section 4.6), these were altered to *I find tests and assignments easy* and *New work is easy for me,* respectively, in order to provide consistency of question format and enhance the quality of the data collected.

Considerable calibration of the wording of scale items was required in order to pre-empt sufficient discriminant validity and avoid overlap between the items in one scale with items in alternative scales. Care had to be taken to avoid sophisticated and non-literal language, given the age of the students who formed the research sample.

4.3.3 Scale Descriptions and Sample Items

Table 4.2 provides a scale description and a sample item from the Actual form of the MSCEI. Each scale aims to identify and measure a discrete aspect of the classroom environment which, in the context of this longitudinal study, is intended to be an area in which change could be experienced by students across the upper primary and junior secondary transition. Six items were originally incorporated into each scale in order to enhance the parsimony of the scale and shed light on which aspects of the scale were perceived to have altered for students across the transition.

The scale intended to measure the level of Difficulty perceived by students in their classrooms in Grade 7 and Grade 8 will, from this point on, be referred to as Ease. While Difficulty has been used in previous classroom environment studies (see Section 4.4.2), the use of the reverse terminology of Ease in this study will enable consistent scoring and congruence of interpretation with the other six scales on the MSCEI.

Table 4.2
Description and a Sample Item for Each Scale in MSCEI

Scale Name	Description of Scale	Sample Item
Ease	Extent to which students find ease with class and assignment work	I find the work in this class easy.
Affiliation	Extent to which students feel a sense of belonging and inclusiveness in class	I belong to this class.
Communication	Extent to which students have opportunity to communicate freely and openly	I am comfortable expressing opinions in this class.
Autonomy	Extent to which students have control over their learning	I have a say in how my class time is used.
Student Cohesiveness	Extent to which students help and are friendly towards each other	I cooperate with other students on class activities.
Teacher Support	Extent to which students are known and supported by the teacher	The teacher takes a personal interest in me.
Cooperation	Extent to which students cooperate rather than compete with one another	Students in this class help me with homework.
Task Orientation	Extent to which class work and activities are clear and well organised	I know what has to be done in this class.
Involvement	Extent to which students participate actively in class activities	My ideas and suggestions are used during class discussions.

Items are scored 1, 2, 3, 4 & 5, respectively, for the responses Strongly Agree, Agree, Can't Decide, Disagree & Strongly Disagree.

All of the items on the MSCEI were worded in the positive to ensure simplicity and consistency of the questionnaire. For example, an item in the Ease scale was worded *I find the work in this class easy for me* (see Table 4.2), rather than *I find the work in this class difficult for me*. Students were asked to register their response on a 5-point alternative, ranging from Strongly Agree to Strongly Disagree. All MSCEI items were scored in the same way, which obviated the need for reverse scoring procedures in

some scales. The positive wording of items followed the WIHIC, which also utilises a similar questionnaire format and design.

4.4 Personal vs Class Forms

A decision was made to use the Personal variation of the questionnaire rather than the Class form. Previous research (Fraser, Giddings & McRobbie, 1995; Fraser & Tobin, 1991; Tobin, Kahle & Fraser, 1990) has indicated that individual students possess varying perceptions of the classroom environment relative to their personal perceptions of their own position in the class. These perceptions can be measured and account taken of individual students or groups of students within the class. As a result, a shift to the Personal rather than the Class form is increasingly more common in the field of classroom environment research, as it has the propensity to provide a richer source of information about social factors that affect knowledge construction. Taylor, Dawson and Fraser (1995) and Taylor, Fraser and Fisher (1997) have successfully researched constructivist learning modalities in classroom learning environments via the personal responses that students make in relation to the social dimensions of learning.

Accordingly, MSCEI scale items that initially held some ambiguity and were related to perceptions of the class as a whole had to be revised to determine personal perceptions of the environment. *My teacher encourages class discussions* was altered to *I am involved in class discussions* in order to elicit the personal rather than the class perspective on student involvement in classroom activities. It is important in a study of this kind that individual student perceptions and responses to roles in the class become the basis of analysis and interpretation. The problem with the class as the unit of research is that, while students' perceptions of the classroom have the potential to provide a 'macro' view of the environment in upper primary and lower secondary, respectively, they do not elicit personal views of the classroom climate. Past research undertaken by Fraser, Giddings and McRobbie (1995) has indicated that, while

students' perceptions of the learning environment were more favourable for the classroom as a whole than for their individual perceptions of, and response to, their own role within the class (see Section 3.3.1).

4.5 Actual and Preferred Forms

In addition to developing an actual form, which measures the participants' perceptions of the actual classroom environment, a preferred variation of the MSCEI was constructed to measure the difference between ideal environments as distinct from those which students actually experience. By altering the wording of the Learning Environment Inventory (LEI) and the My Class Inventory (MCI), Fraser and Deer (1983) and Fraser and O'Brien (1985) devised complementary variations of those instruments which aimed to identify ideal or preferred classrooms. Used successfully to provide profiles of ideal archetypes of psychosocial environments in past research (Fisher & Fraser, 1982, 1983a; Fraser, 1984; Hofstein, Cohen & Lazarowitz, 1996; Raviv, Raviv & Reisel, 1990), preferred forms have the capacity to measure the disparity between student perceptions of classroom environments that actually exist and those that they prefer. It was anticipated that differences in perception would exist on the MSCEI between what students regard as the actual and preferred classroom environments at Grade 7 and Grade 8, respectively. The use of actual and preferred forms was believed to be particularly important for the present research in order to ascertain whether a larger disparity between actual and preferred environments exist in Grade 8 or in Grade 7 classrooms. This presents a method of formalising changes and drawing conclusions associated with the transition between upper primary and lower secondary schooling. Therefore, both forms were included in this study.

The wording for each form is almost identical. For example, *I feel safe in this class* in the Actual form is altered to *I would be safe in this class* in the Preferred form. Differences in the wording of items for the Actual and Preferred forms for each scale

in the MSCEI is demonstrated in Table 4.3. Appendices B and D contain the Actual and Preferred variations of the MSCEI.

4.6 Preliminary Field Testing

Following construction of the MSCEI scales, which drew upon existing questionnaires, associated literature on middle schooling and the experience of students involved in the reference group, the MSCEI was field tested to see if the scales were 'readable' or held potential difficulty with meaning. Assumptions were not made about literacy levels among the students who would form the research sample at Grade 7 and Grade 8 levels. The actual and preferred versions of the instrument were administered to the reference group who responded to the 60 items on a five-point Likert scale. As the researcher was not going to administer the questionnaires personally, the instructions associated with responding to the instrument, as well as the wording of the items, needed to be clear so that problems would not be encountered during questionnaire administration. Accordingly, only the instructions associated with completing the questionnaire and issues of confidentiality were discussed with the student sample.

The students completed the actual and preferred questionnaires in approximately 12 minutes, expressing little difficulty in understanding or responding to the questionnaire or the individual questionnaire items. There were, however, some fine-tune adjustments made to some of the items based upon preliminary field-testing. For example, some students were unsure about the scale item that was worded *New work is not difficult for me*. This was amended into a positive statement *New work is easy for me*. It was important that discussion associated with the questionnaire was held immediately following the trial so that student impressions and responses were not forgotten.

The wording of the questionnaire and the fact that many of the scales comprising the MSCEI had been used in previous research with students of a similar age level (Aldridge, Huang & Fraser, 1998; Anderson & Walberg, 1974; Chionh & Fraser, 1998; Fisher & Fraser, 1981; Fraser & Chionh, 2000; Fraser, Fisher & McRobbie, 1996; Rawnsley & Fisher, 1997) ensured that few problems were identified at the preliminary field-testing stage.

Table 4.3
Differences in the Wording of Items in the Actual and Preferred Forms of the MSCEI

Scale Name	Actual Form	Preferred Form
Ease	I find the work in this class easy.	I would find the work in this class easy.
Affiliation	I belong to this class.	I would belong to this class.
Communication	I am comfortable expressing opinions in this class.	I would be comfortable expressing opinions in this class.
Autonomy	I have a say in how my class time is used.	I would have a say in how my class time is used.
Student Cohesiveness	I co-operate with other students on class activities.	I would co-operate with other students on class activities.
Teacher Support	The teacher takes a personal interest in me.	The teacher would take a personal interest in me.
Cooperation	Students in this class help me with homework.	Students in this class would help me with homework.
Task Orientation	I know what has to be done in this class.	I would know what has to be done in this class.
Involvement	My ideas and suggestions are used during class discussions.	My ideas and suggestions would be used during class discussions.

4.7 Pre-Transition and Post-Transition Administrations of the MSCEI

Administration of the MSCEI actual and preferred forms was undertaken in two distinct phases. The pretest, which was administered to Grade 7 students near the end of the calendar year, was designed to extract actual and preferred perceptions of the environment while students were in the latter stages of primary schooling. The posttest was undertaken half way through the following Grade 8 year after sufficient time had elapsed to allow students to have a consolidated body of experience in junior secondary classrooms. In the main, when considering the actual and preferred questionnaires at the time of pretesting, there was no attempt to differentiate between school subjects. Qualitative research indicated that most students in Grade 7 classes are based in one room with a small number of teachers. The assumption was made that the classroom environment and the personal view held by the student would remain relatively constant across school subjects because the majority of teaching is undertaken by one or a few teachers, and is conducted substantially in the same room. However, the posttest questionnaire needed to accommodate a wider number of teachers and environments to which students are exposed in the junior secondary school, particularly in subjects such as Mathematics, Science, English, and Society and Environment. While specialist teachers are integrated into the upper primary school, the majority of mainstream teaching in core subjects is conducted by one or two teachers only. This is in sharp contrast to the junior secondary years.

Accordingly, the posttest actual version of the MSCEI was administered in English and Mathematics classrooms in the secondary school. These are subjects that have inherently different epistemologies and content, and often bring varying methodological approaches at the classroom level. For the sake of efficiency, both subjects were rated using the one form to allow students the opportunity to differentiate between each subject at the classroom level. The structure of the posttest preferred version of the MSCEI did not differentiate between school subjects as it was believed that perceptions of ideal classrooms (i.e. preferences for psychosocial aspects

of the environment such as Teacher Support and Student Cohesiveness) would remain fairly constant across different subject areas.

The purpose behind using actual and preferred forms of questionnaires as both pretests and posttests was to see whether any noticeable differences existed between the classroom perceptions of Grade 7 and Grade 8 on each MSCEI scale.

4.8 Satisfaction as a Dependent Variable

In addition to the nine original scales on the MSCEI, Satisfaction was used as a dependent variable to investigate whether students' satisfaction was related to other dimensions of classroom environment. This was based on a scale originally devised by Walberg (1968a) in the Learning Environment Inventory (LEI) which was revised on several occasions and used extensively over successive decades to assess the relationship between classroom environment and student satisfaction (Anderson & Walberg, 1974; Fraser, 1981a; Fraser & Walberg, 1981; Heartel, Walberg & Haertel, 1981; Randhawa & Fu, 1973; Walberg, 1976, 1979; Walberg & Haertel, 1980). The Satisfaction scale was also incorporated in the My Class Inventory (MCI), which was devised specifically for children from eight to 12 years of age (Fisher & Fraser, 1981; Fraser, Anderson & Walberg, 1982).

The Satisfaction scale can be found in Appendix B and Appendix D as items 55-60 at the bottom of the MSCEI. Although a separate scale, Satisfaction items were included for convenience at the end of the MSCEI to make it easy for students to respond. Satisfaction was incorporated into the study to assess associations between selected classroom environment scales and the levels of satisfaction perceived by students. While adequate levels of Teacher Support, Student Cohesiveness, Task Orientation, Affiliation, Autonomy and Involvement are likely to engender high levels of satisfaction, it is possible that particular scales are more strongly associated with

student perceptions of satisfaction at different grade levels than others. For example, contemporary research into middle schooling would suggest that opportunities for students to work independently at the classroom level are likely to be appealing and be synonymous with more favourable perceptions of the environment (Eyers, Cormack & Barratt, 1993).

4.9 Validation of the Middle School Classroom Environment Indicator (MSCEI)

This section reports statistical analyses of the data collected with the MSCEI to assess student perceptions of classroom environments in Grade 7 and Grade 8. Various analyses were undertaken involving factor structure, internal consistency reliability (Cronbach alpha coefficient), discriminant validity (using the mean correlation of a scale with other scales as a convenient index), and ability to differentiate between classrooms (eta^2 statistic from ANOVA) using both the class and the individual as the units of analysis. This section reports refinement to the original instrument through factor analyses, together with data supporting factorial validity (Section 4.9.1), internal consistency reliability (Section 4.9.2), discriminant validity (Section 4.9.3) and the ability to differentiate between classrooms (Section 4.9.4). Alpha reliability and discriminant validity are independently reported for the preferred form in Section 4.9.5.

4.9.1 Refinement and Factor Structure

The first step in refining the MSCEI involved a principal components factor analysis with varimax rotation for each of the three data sets. This process utilised the three separate samples of 311 Grade 7 students, 575 Grade 8 Mathematics students and 575 Grade 8 English students, as outlined in Section 3.2. These analyses were carried out for the original version of the MSCEI with 54 items in nine scales. This series of

factor analyses led to the deletion of 21 of the original items and two of the original scales, namely Communication and Cooperation. The refined version of the MSCEI then contained 33 items in seven scales as shown in Table 4.4 (actual version) and Table 4.5 (preferred version).

Given the degree of parsimony being sought, it was anticipated that statistical analysis would lead to the removal of some scales and items. For example, Student Cohesiveness and Cooperation were designed to sharpen the focus on peer relations in the classroom and to see whether discernable differences in the social environment could be measured between Grade 7 and 8, respectively. Because factor analysis revealed insufficient discrimination between these two scales, they were incorporated under the one heading of Student Cohesiveness.

Similarly, the scale intended to measure student perceptions associated with Autonomy has proven volatile in the past (Fraser, McRobbie & Fisher, 1996.) Were it not such an important aspect of middle schooling, as indicated by students in the reference group and scholars researching this particular aspect of middle schooling, the scale would not have formed part of the MSCEI. Fortunately, the statistical analysis allowed the retention of Autonomy.

Table 4.4 displays the factor loadings for the actual version of the MSCEI for three data sets (Grade 7, Grade 8 English and Grade 8 Mathematics) when the individual student was used as the unit of analysis. All factor loadings smaller than 0.4 have been omitted in Table 4.4. With 33 items in each of the three data sets for seven different scales, there is a total of 693 factor loadings possible in Table 4.4. There are 16 cases in Table 4.4 for which an item didn't load at least 0.4 on its own scale, while there are eight cases for which an item did load at least 0.4 on another scale besides its own. In total, there were only 24 problematic results out of 693, indicating that the MSCEI has a reasonably sound overall factor structure.

Table 4.4
Factor Loadings for Actual Version of MSCEI for Grade 7, Grade 8 English and Grade 8 Mathematics

	Factor Loading																			
Item	Ease			Affiliation			Autonomy			Student Cohesiveness			Teacher Support			Task Orientation			Involvement		
	Gr 7	Eng	Ma	Gr 7	Eng	Ma	Gr 7	Eng	Ma	Gr 7	Eng	Ma	Gr 7	Eng	Ma	Gr 7	Eng	Ma	Gr 7	Eng	Ma
1	.75	.76	.82																		
4	.75	.76	.80																		
5	.68	.72	.72																		
6	.57	.58	.63																		
7				.62	.69	.70															
8				.69	.65	.68															
9				.76	.67	.71															
10				.55	.59	.58															
12				.68	.68	.71															
19							.55	-	.53												
21							.58	.69	.68												
22							.41	-	-												
24							.67	.54	.75												
27										.44	.62	-									.56
30										.50	.58	-									.50
37										.72	.58	.57									
38								.43		.55	.49	.59									
41										.59	.53	.66									
42										.48	.47	.56									
31													-	.50	.47						
32													.67	.58	.65						
33													.55	.50	.59						
34													.51	.72	.70						
35													.43	.50	.59						
43																.47	.58	-			
45																.51	.54	-			
46																.51	.40	-			
47											.41					.49	.47	-			
50																			.48	-	-
51																			.45	.45	.46
52										.42	.56								.44	-	-
53																			.76	.64	-
54										.41	.65								.62	-	.48
% Variance	3.9	5.1	7.7	23.5	30.3	29.7	2.1	3.7	6.7	6.7	7.0	5.4	3.3	5.3	5.7	1.7	3.6	4.4	3.8	3.6	4.8

Loadings smaller than 0.4 omitted

Overall, factor analysis for the actual version of the instrument in Grade 7 was particularly strong, with consistently high factor loadings. Separate posttest results for English and Mathematics in Grade 8 are also strong for Ease, Affiliation, Student Cohesiveness and Teacher Support, with less consistent results for Task Orientation in Mathematics and for Involvement in both Mathematics and English.

The structure of the final version of the questionnaire is solid, with relatively few items overlapping with other scales and nearly all loading onto their original scale. Factor loadings for Ease, Affiliation, Autonomy, Student Cohesiveness and Teacher Support are particularly high, but some attenuation is noticed in the factor loadings associated with the Involvement scale for Grade 8 English and Mathematics, and with the Task Orientation scale in Grade 8 Mathematics. This accepted, the scales on the MSCEI present a congruent and cohesive factor structure that supports the validity of the instrument.

Table 4.5 reports the factor structure for the corresponding preferred version of the MSCEI. Because preferred classroom environments were assumed to be consistent for both subjects in secondary school, the preferred questionnaire did not differentiate between subjects, thus providing only two data sets for analysis (Grade 7 and Grade 8) instead of three. Factor loadings for the preferred form of the MSCEI are consistent with the results for the actual form, with sound loadings for each of the scales and few scales overlapping with each other. There are 33 items in each of the two data sets for seven scales, which accounts for 482 individual factor loadings in Table 4.5. Therefore, there are only six instances for which an item didn't load at least 0.4 on its own scale, while there were only seven instances for which an item did load at least 0.4 on a scale other than its *a priori* scale. There are only 13 problematic results out of 482 individual cases.

Table 4.5
Factor Loadings for Preferred Version of MSCEI for Grade 7 and Grade 8 (English and Mathematics Combined)

	Factor Loading													
Item	Ease		Affiliation		Autonomy		Student Cohesiveness		Teacher Support		Task Orientation		Involvement	
	Gr	Gr 8	Gr	Gr 8	Gr 7	Gr 8	Gr 7	Gr 8	Gr 7	Gr 8	Gr 7	Gr 8	Gr 7	Gr 8
1	.74	.81												
4	.83	.86												
5	.83	.79												
6	.80	.73												
7			.70	.66										
8			.66	.60										
9			.72	.69										
10			.84	.68										
12			.67	.68										
19					.53	.63								
21					.64	.79								
22					.40	.53								
24					.79	.81								
27							.49	.68						
30							.40	.67						
37							.73	.64						
38							.63	.71						
41							.83	.60						
42							.60	.66						
31									.46	.61	.43			
32									.71	.72				
33									.49	.73	.49			
34									.78	.56				
35									.63	.46				
43									.43		-	.58		
45							.46				-	.62		
46							.43				-	.46		
47							.54				-	.74		
50													.56	.70
51											.63		-	.56
52													.73	.76
53											.66		-	.52
54													.50	.45
% Variance	4.2	4.1	9.5	9.9	3.2	3.1	30.8	32.9	4.7	4.4	1.7	2.1	2.7	3.8

Loadings smaller than 0.4 omitted

Factor loadings in Table 4.5 are particularly strong for the scales in the preferred version of the MSCEI associated with Ease, Affiliation, Autonomy, Student Cohesiveness and Teacher Support. However, as is the case in the Actual form (see Table 4.4), factor analysis results are less strong for Task Orientation and Involvement.

4.9.2 Reliability

Table 4.6 reports the internal consistency reliability – that is, the extent of internal cohesion that exists between the items that make up a particular scale (Cronbach alpha coefficient) for two units of analysis (individual and class mean). The internal consistency (alpha reliability) for the refined version of each MSCEI scale was estimated by using both the individual student and class mean as the unit of analysis. Reliability coefficients for different scales for Grade 7 ranged from 0.69 to 0.86 when using the individual as the unit of analysis and from 0.82 to 0.95 when using the class as the unit of analysis. For English and Mathematics at Grade 8, reliability coefficients ranged from 0.62 to 0.86 and from 0.68 to 0.89 using the student as the unit of analysis, while reliabilities ranged from 0.43 to 0.91 and from 0.59 to 0.92 for the class as the unit of analysis for English and Mathematics, respectively. The higher reliabilities for class mean scores generally were expected. These results indicate high coherence between the items in the same scale for each scale of the MSCEI.

4.9.3 Discriminant Validity

The discriminant validity coefficients (namely, the mean correlation of a scale with other scales) for the Grade 7 data ranged from 0.12 to 0.43 for the individual as the unit of analysis and from 0.17 to 0.61 using the class as the unit of analysis. Discriminant validity for Grade 8 ranged from 0.31 to 0.56 for English and from 0.25 to 0.50 for Mathematics using the student as the unit of analysis, whereas values

ranged from 0.27 to 0.68 for English and from 0.47 to 0.68 using the class as the unit of analysis for Mathematics at Grade 8. Discriminant validity coefficients indicate that the scales on the MSCEI are generally independent, although somewhat overlapping.

Table 4.6
Internal Consistency (Alpha Reliability Coefficient), Discriminant Validity (Mean Correlation of a Scale with Other Scales) and Ability to Differentiate Between Classrooms (ANOVA Results) for MSCEI for Two Units of Analysis for Actual Form

Scale	Unit of Analysis	Alpha Reliability			Mean Correlation with Other Scales			ANOVA Eta^2		
		Gr 7	Eng	Ma	Gr 7	Eng	Ma	Gr 7	Eng	Ma
Ease	Student	.78	.82	.85	.12	.31	.25	.03	.09**	.11**
	Class	.82	.91	.90	.17	.27	.50			
Affiliation	Student	.86	.86	.87	.37	.56	.45	.17**	.16**	.13**
	Class	.95	.91	.90	.61	.58	.61			
Autonomy	Student	.69	.62	.68	.35	.39	.35	.24**	.06	.14**
	Class	.86	.43	.59	.54	.68	.47			
Student Cohesiveness	Student	.78	.80	.80	.37	.47	.45	.17**	.14**	.12**
	Class	.91	.88	.89	.53	.60	.58			
Teacher Support	Student	.79	.81	.81	.42	.49	.29	.20**	.12**	.17**
	Class	.89	.82	.92	.59	.61	.60			
Task Orientation	Student	.72	.75	.71	.43	.50	.50	.14**	.12**	.13**
	Class	.88	.81	.84	.60	.64	.65			
Involvement	Student	.76	.75	.77	.39	.48	.45	.09**	.12**	.12**
	Class	.93	.85	.86	.46	.65	.68			

**$p < 0.01$
Sample size was 311Grade 7 students in 16 classes and 575 students in 26 Grade 8 English and Mathematics classes.
Eta^2 is the ratio of 'between' and 'total' sums of squares and represents the proportion of variance in scale scores accounted for by class membership.

4.9.4 Ability to Differentiate Between Classrooms

An analysis of variance (ANOVA) was used to indicate the ability of the actual version of each MSCEI scale to differentiate between student responses in different classrooms. The eta^2 statistic was calculated to estimate the strength of association between class membership and the dependent variable for the actual form of each scale of the MSCEI. Table 4.6 reports the ANOVA results for Grade 7 and for the two subjects in Grade 8. The amount of variance in scores accounted for by class membership ranged from 0.03 to 0.24 in Grade 7, from 0.06 to 0.16 in Grade 8 English, and from 0.4 to 0.17 in Grade 8 Mathematics. The results in Table 4.6 with the exception of Ease in Grade 7 and Autonomy in Grade 8 English, indicate that each scale differentiated significantly between classes ($p < 0.01$) in Grade 7 and for two subjects in Grade 8.

4.9.5 Alpha Reliability and Discriminant Validity of Preferred Form

Table 4.7 compares alpha reliabilities and discriminant validity for the actual and preferred versions of MSCEI scales, using the students as the unit of analysis in Grade 7. Ability to differentiate between classrooms is not relevant for the preferred form. Alpha reliabilities for the preferred form are similar to those obtained with the actual form, ranging from 0.74 for the Autonomy scale to 0.88 for the Ease scale. Discriminant validity coefficients for the preferred form range from 0.10 for the Ease scale to 0.47 for the Task Orientation scale. Similarities in the values for discriminant validity for the preferred and actual forms indicate that scales are generally independent, although sometimes overlapping.

Table 4.7
Number of Items, Internal Consistency (Alpha Reliability Coefficient) and Discriminant Validity (Mean Correlation of a Scale with Other Scales) for Actual and Preferred Forms Using the Student as the Unit of Analysis

MSCEI Scale	No of Items	Form	Alpha Reliability	Mean Correlation With Other Scales
Ease	4	Actual	0.78	0.12
		Preferred	0.88	0.10
Affiliation	5	Actual	0.86	0.34
		Preferred	0.87	0.44
Autonomy	4	Actual	0.69	0.35
		Preferred	0.74	0.37
Student Cohesiveness	6	Actual	0.78	0.37
		Preferred	0.86	0.46
Teacher Support	5	Actual	0.89	0.42
		Preferred	0.74	0.40
Task Orientation	4	Actual	0.72	0.43
		Preferred	0.81	0.47
Involvement	5	Actual	0.76	0.39
		Preferred	0.80	0.39

N= 311

4.10 Conclusion

The Middle School Classroom Environment Indicator (MSCEI) is a new instrument designed to measure salient psychosocial features of classroom environments in upper primary and lower secondary grades. Using the views of milieu participants facing this important transition, previous classroom environment research, and the growing body of knowledge associated with middle schooling, scales and items were developed that were believed to hold specific relevance to classroom environments in upper primary and lower secondary school. The MSCEI was administered to measure student perceptions of distinctive aspects of the environment in two quite distinct phases, namely, prior to leaving primary school and some months after being immersed in the secondary regimen.

Nine scales comprising 54 items were originally selected for inclusion on the MSCEI, including Ease, Affiliation, Autonomy, Communication, Student Cohesiveness, Teacher Support, Cooperation, Task Orientation and Involvement. Following factor analysis and refinement, seven scales and 33 items were retained, with the scale of Communication being removed and the scale of Cooperation being amalgamated with Student Cohesiveness. Subsequently, the MSCEI was administered at two stages to assess the classroom environment scales of Ease, Affiliation, Autonomy, Student Cohesiveness, Teacher Support, Task Orientation and Involvement to students moving from Grade 7 to Grade 8.

A personal form of the MSCEI aimed specifically to elicit individual student perceptions of the classroom environment rather than those of the class as a whole. Actual and preferred forms were used and both were subjected to extensive statistical interrogation and validation. Factor structure, discriminant validity, alpha reliability and ANOVA results for class membership differences attest that the instrument has sound validity and reliability. This has been demonstrated in relation to the individual and the class as two separate units of analysis and for the actual and preferred versions

of the instrument. Three separate data sets involving Grade 7, Grade 8 English and Grade 8 Mathematics classes were used in assessing the overall validity and reliability of the instrument at each phase of data collection.

Interpretation of quantitative data in other parts of the study therefore was based upon an instrument that has satisfied extensive statistical interrogation and exhibits coherence and congruence throughout.

CHAPTER 5

Results: Quantitative Data

5.1 Overview

This chapter discusses the findings associated with the use of the Middle School Classroom Environment Indicator (MSCEI), and addresses key research questions outlined in Chapter 1. These include:

- Do differences exist between actual and preferred environments in Grade 7 and Grade 8 classrooms?
- Do differences exist between perceptions of Mathematics and English classrooms in Grade 8?
- Are differences between actual and preferred environments magnified by the transition to secondary school?
- Does the transition to secondary school affect student perceptions of actual classroom environment?
- What dimensions of classroom environment are most closely associated with student satisfaction?

Section 5.2 addresses the first three questions and reports the differences between preferred and actual environments in Grade 7 and Grade 8 English and Mathematics classes. Section 5.3 addresses the fourth question by comparing and contrasting actual perceptions of environment across the transition of primary to secondary school. Section 5.4, which addresses the fifth question, reports associations between satisfaction as an independent variable and the dimensions of classroom environment

assessed by the MSCEI. Section 5.5 offers a summary and conclusions that can be drawn from an analysis of the aggregated quantitative data.

Specific attention is drawn to overarching perceptions of classroom environments in Grade 7 and Grade 8, respectively, from the 311 students involved in the sample. The total sample of 575 students was used for the validation of the instrument in Grade 8, but analysis of change in students' perceptions across transition was restricted to the longitudinal sample of 311 students that was common in Grade 7 and Grade 8.

5.2 Preferred and Actual Classroom Environments in Grade 7 and Grade 8

This section discusses the differences between preferred and actual classroom environments in Grade 7 and Grade 8 classrooms. Section 5.2.1 reports the discrepancies between perceptions of preferred and actual classroom environments before transition to secondary school. Section 5.2.2 and Section 5.2.3 report and compare the differences between perceptions of preferred and actual classrooms in English classes and Mathematics classes, respectively, after transition. Section 5.2.4 reports student perceptions of preferred classroom environments that altered during the transition process.

5.2.1 Preferred and Actual Classroom Environments Before Transition

For the sample of 311 students, actual and preferred scores are reported in Table 5.1 for the seven scales on the MSCEI in Grade 7 classrooms. The average item mean (the scale mean divided by the number of items in each scale) is used to permit easy comparison of scales containing different numbers of items. The average item standard deviation is also shown in this table. *T* tests for paired samples and effect sizes are also reported as measures of the disparity between actual and preferred environments.

Effect sizes are calculated by subtracting the item means for actual and preferred scores and dividing this by the average item standard deviation. Each of these calculations are reported in Table 5.1 to highlight the differences between actual and preferred environments in Grade 7 classrooms.

Table 5.1
Descriptive Statistics (Average Item Mean, Average Item Standard Deviation) for Actual and Preferred Form of Each Middle School Classroom Environment Indicator (MSCEI) Scale, and Differences Between Actual and Preferred Scores (Effect Size and *t* Test for Paired Samples) for Grade 7 Classrooms

Scale	No of Items	Average Item Mean		Average Item Standard Deviation		Differences Between Actual and Preferred	
		Actual	Preferred	Actual	Preferred	Effect size	*t*
Ease	4	3.32	3.38	0.69	0.99	0.08	0.71
Affiliation	5	4.52	4.64	0.55	0.54	0.22	2.94**
Autonomy	4	3.61	4.25	0.77	0.67	0.88	10.03**
Student Cohesiveness	6	4.30	4.50	0.53	0.55	0.37	5.12**
Teacher Support	5	3.94	4.20	0.69	0.67	0.44	5.25**
Task Orientation	4	4.28	4.51	0.57	0.57	0.40	5.26**
Involvement	5	3.93	4.19	0.65	0.64	0.40	5.25**

**$p < 0.01$

Mean scores for each scale are higher for the preferred form in every instance, clearly demonstrating that students' perceptions of their actual classroom environments in Grade 7 are well beneath those of their preferred environments. *T* tests for paired samples, using the individual as the unit of analysis, were used to ascertain whether the differences in scores between actual and preferred perceptions were statistically

significant. The results show that statistically significant differences ($p<0.01$) occurred for the scales of Affiliation, Involvement, Student Cohesiveness, Task Orientation and Teacher Support, with a nonsignificant difference for the scale of Ease. For each of these six scales, students preferred a more favourable classroom environment than the one perceived to be actually present.

In order to assess further the degree of difference between actual and preferred perceptions of classrooms for students involved in the sample, effect sizes were also calculated, as advocated by Thompson (1998a, 1998b). The effect size for different scales of the MSCEI ranged from one fifth to almost one standard deviation, suggesting that meaningful differences exist between perceptions of preferred and actual classroom environments for most MSCEI scales.

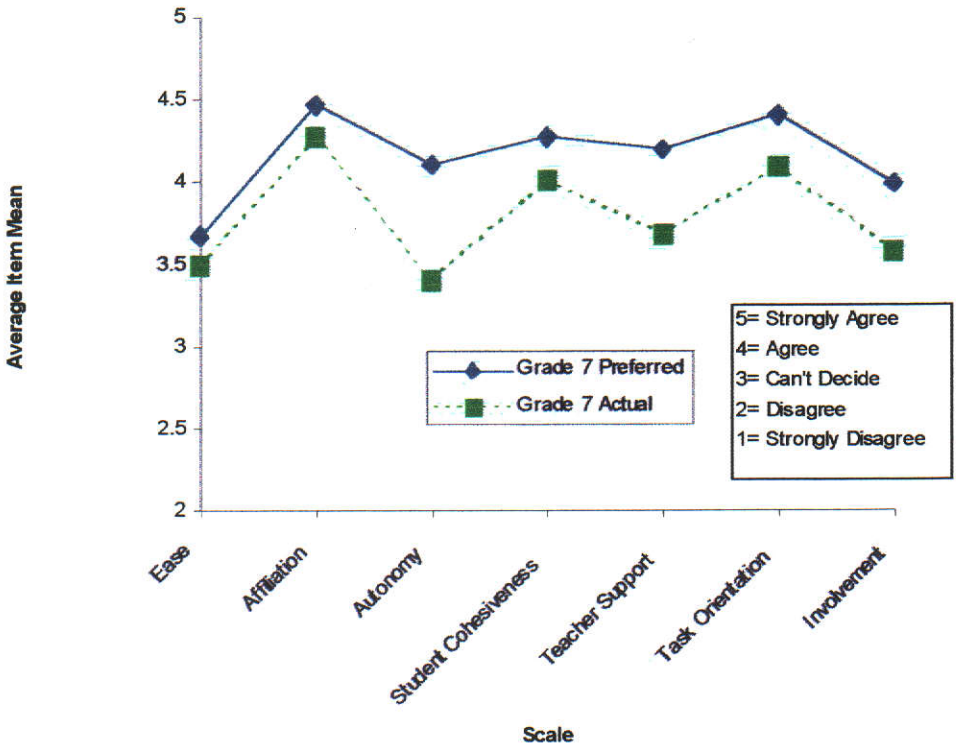

Figure 5.1 Students' Perceptions of the Preferred and Actual Classroom Environments in Grade 7 Classes

The pattern of actual-preferred differences shown in Table 5.1 for Grade 7 can be easily seen through the graphical representation of the average item mean scores, shown in Figure 5.1. This figure illustrates the higher mean scale scores evident for preferred forms of each scale compared with the actual form, with the exception of the Ease scale.

5.2.2 Preferred and Actual Classroom Environments After Transition for Grade 8 English

Comparison of actual and preferred learning environments in Grade 8 English, as displayed in Table 5.2, reveals similar 'trendlines' to those established by an analysis of data associated with Grade 7 classrooms. Average item mean scores for all scales of the preferred version of the instrument are higher than for the actual, with significant differences ($p<0.01$) indicated by t tests for paired samples for the scales of Affiliation, Autonomy, Involvement, Student Cohesiveness, Task Orientation and Teacher Support. Non-significant differences between actual and preferred environments in Grade 8 occurred for the scale of Ease, which is a similar pattern to that for Grade 7 classes.

Table 5.2 also reports the effect sizes and t test scores for each of the scales for actual and preferred versions of the MSCEI in Grade 8 English. Effect sizes are larger than the values reported for the differences between actual and preferred environments for Grade 7 (see Table 5.1), with figures ranging from about one third to in excess of one standard deviation for all scales on the MSCEI, indicating substantial difference between actual and preferred environments in Grade 8 English classes. The results for Grade 8 Mathematics are reported independently in Section 5.2.3.

Table 5.2
Descriptive Statistics (Average Item Mean, Average Item Standard Deviation) for Actual and Preferred Form of Each MSCEI Scale, and Differences Between Actual and Preferred Scores (Effect Size and *t* Test for Paired Samples) for Grade 8 English Classrooms

MSCEI Scale	No. of Items	Average Item Mean		Average Item Standard Deviation		Differences between Actual and Preferred	
		Actual	Preferred	Actual	Preferred	Effect size	*t*
Ease	4	3.50	3.68	0.70	0.89	0.19	2.70
Affiliation	5	4.27	4.47	0.69	0.61	0.31	4.90**
Autonomy	4	3.41	4.11	0.64	0.72	1.03	11.89**
Student Cohesiveness	6	4.01	4.27	0.56	0.68	0.42	6.62**
Teacher Support	5	3.69	4.20	0.75	0.67	0.72	11.18**
Task Orientation	4	4.09	4.41	0.57	0.59	0.55	7.69**
Involvement	5	3.58	3.99	0.67	0.72	0.59	7.82**

*$p < 0.05$, **$p < 0.01$

The graph of average item mean scores for Grade 8 English students' actual and preferred perceptions of the learning environment illustrates the consistently higher mean scores for the preferred version for each environment scale on the MSCEI (see Figure 5.2). While the pattern is not identical to that in Grade 7 classrooms, particularly as greater disparity is revealed between actual and preferred dimensions, the pattern is reasonably similar to the Grade 7 profiles.

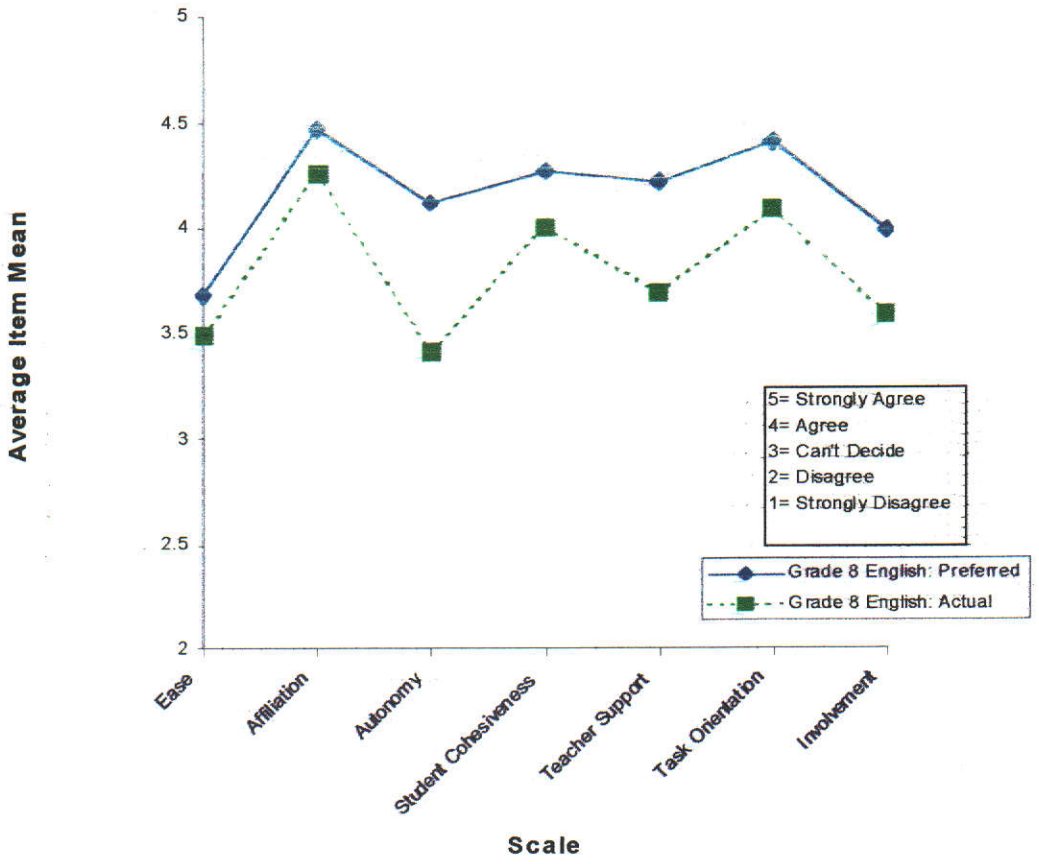

Figure 5.2 Students' Perceptions of the Actual and Preferred Classroom Environments in Grade 8 English Classes

5.2.3 Preferred and Actual Classroom Environments After Transition for Mathematics

Descriptive statistics for actual and preferred classroom environments in Grade 8 Mathematics are reported in Table 5.3 and show a similar pattern of perceptions to those of Grade 8 English.

Table 5.3
Descriptive Statistics (Average Item Mean, Average Item Standard Deviation) for Actual and Preferred Form of Each MSCEI Scale, and Differences Between Actual and Preferred Scores (Effect Size and *t* Test for Paired Samples) for Grade 8 Mathematics Classrooms

MSCEI Scale	No. of Items	Average Item Mean		Average Item Standard Deviation		Differences Between Actual and Preferred	
		Actual	Preferred	Actual	Preferred	Effect size	*t*
Ease	4	3.23	3.68	0.73	0.89	0.57	6.26**
Affiliation	5	4.20	4.47	0.70	0.61	0.43	6.38**
Autonomy	4	3.15	4.11.	0.73	0.72	1.29	14.92**
Student Cohesiveness	6	3.93	4.27	0.65	0.68	0.54	7.46**
Teacher Support	5	3.74	4.22	1.19	0.67	0.52	6.01**
Task Orientation	4	4.02	4.41	0.59	0.59	0.57	9.26**
Involvement	5	3.74	3.99	0.67	0.72	0.36	4.80**

*$p < 0.05$ **$p < 0.01$

Average item mean scores for all scales on the MSCEI are higher for the preferred version of the instrument than the actual, with effect sizes and *t* tests attesting to larger difference between actual and preferred environments in Grade 8 Mathematics than in Grade 7 classrooms. Effect sizes for numerous MSCEI scales are larger for Grade 8 Mathematics than for Grade 7, indicating a similar pattern in most scales to Grade 8 English. *T* tests also highlight significant differences between actual and preferred environments in Grade 8 Mathematics on all of the MSCEI scales. Effect sizes for Grade 8 Mathematics range from about a third to one and a quarter standard deviation.

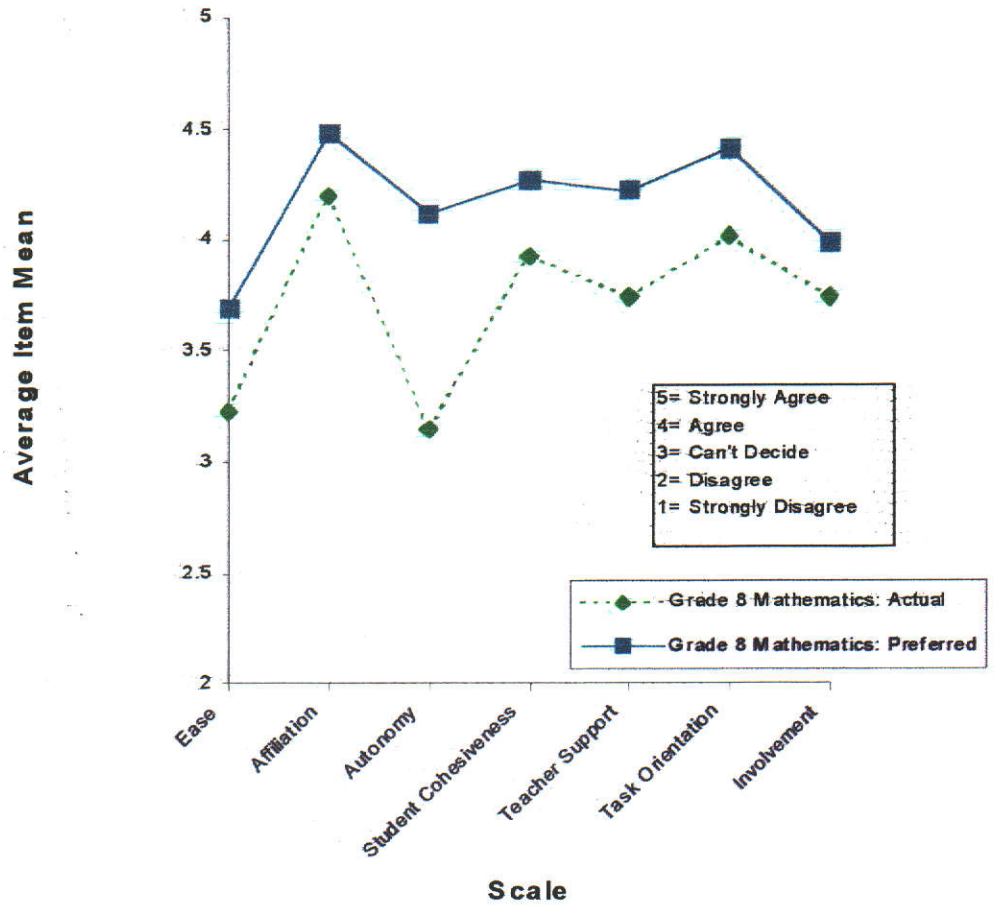

Figure 5.3 Students' Perceptions of the Actual and Preferred Classroom Environments in Grade 8 Mathematics Classes

Figure 5.3 displays the average item mean scores for Grade 8 Mathematics students' actual and preferred perceptions of the learning environment. This demonstrates the consistently higher mean scores for the preferred version for each environment scale on the MSCEI. While the pattern is not identical to that in Grade 7 or Grade 8 English classrooms, the trend is similar in the other six scales of the MSCEI. The interpretation

of results for Ease is in the same direction as for other scales as students prefer more Ease.

5.2.4 Comparison of Actual and Preferred Classroom Environments in Grade 7 and Grade 8 English and Grade 8 Mathematics

Comparison of the three sets of data and descriptive statistics reveals sizeable, replicated and generalised differences between preferred and actual classroom environments in Grade 7, Grade 8 English and Grade 8 Mathematics classes. It can be reasonably inferred that there is greater disparity between actual and preferred environments in Grade 8 classrooms for the two subjects for which student perceptions were elicited than what existed in Grade 7 classrooms. Increases in the size of actual-preferred differences is somewhat larger for the scales of Affiliation, Autonomy, Student Cohesiveness, Task Orientation and Teacher Support for both Mathematics and English classes in Grade 8, relative to Grade 7. While an increase in the Ease scale is reported for Grade 8, a larger disparity between actual and preferred environments exists for Mathematics classes than for English classes.

Results for preferred and actual environments corroborate earlier work in this area (Fraser, 1984; Hofstein, Cohen & Lazarowitz, 1996) and attest to the fact that students generally are exposed to actual classroom environments that are beneath their expectations of preferred classroom environments. Past research (Fraser, 1990; Fraser & Fisher, 1983c, 1983d) indicates that students achieve more highly when there is a greater level of congruence between preferred and actual dimensions of classroom environments (see Section 2.5.5), which provides grounds for further research, particularly into the important transition between primary and secondary school. In addition, the emerging body of literature into middle schooling reports the situational alienation of students and disinclination to learn during the middle years of schooling

(Cormack, 1996a; Cumming 1996a, 1996b; Lee & Smith, 1993; Lounsbury & Clark, 1990; Trusty & Dooley-Dickey, 1993).

Table 5.4 compares average item mean scores for actual and preferred versions of the MSCEI in Grade 7, and Grade 8 English and Grade 8 Mathematics classes. This table displays the magnitude of actual-preferred difference for each scale before transition (Grade 7) and after transition (Grade 8). Apart from the higher values for preferred classrooms for Grade 7 already reported, there is greater disparity between perceptions of actual and preferred classrooms for the scales of Affiliation, Autonomy, Ease, Student Cohesiveness, Task Orientation and Teacher Support in Grade 8 English and Grade 8 Mathematics classes than in Grade 7. The only scale which shows a greater relative concordance with actual and preferred environments in Grade 8 is Involvement, which has lower values for Grade 7 than Grade 8 Mathematics, indicating less difference between actual and preferred classrooms in this scale after transition.

Analysis of comparative differences between perceptions of actual and preferred classroom environments paints an interesting picture and confirms that students' perceptions of classroom environments in Grade 8 are less favourable than in Grade 7 for six of the seven environment scales of the MSCEI. Figures indicate that there are discrepancies between actual and preferred environments in Grade 8 English and Grade 8 Mathematics classes, with student perceptions of Mathematics classrooms being less favourable on the scales of Affiliation, Autonomy, Student Cohesiveness, Task Orientation and Ease than those for English classes. Student perceptions of Mathematics classrooms are more favourable than English for the scales of Involvement and Teacher Support.

Table 5.4
Average Item Mean Scores for Actual and Preferred Forms of the MSCEI and Magnitude of Actual-Preferred Difference for Each Scale for Grade 7, Grade 8 English and Grade 8 Mathematics

MSCEI Scale	Grade 7			Grade 8 English			Grade 8 Mathematics		
	Actual Form	Preferred Form	Difference	Actual Form	Preferred Form	Difference	Actual Form	Preferred Form	Difference
Ease	3.32	3.38	**0.06**	3.50	3.68	**0.18**	3.23	3.69	**0.46**
Affiliation	4.52	4.64	**0.12**	4.27	4.48	**0.21**	4.20	4.48	**0.28**
Autonomy	3.61	4.25	**0.64**	3.41	4.11	**0.70**	3.15	4.12	**0.97**
Student Cohesiveness	4.30	4.50	**0.20**	4.01	4.27	**0.26**	3.93	4.27	**0.34**
Teacher Support	3.94	4.20	**0.26**	3.69	4.22	**0.53**	3.74	4.22	**0.48**
Task Orientation	4.28	4.51	**0.23**	4.09	4.41	**0.32**	4.02	4.41	**0.39**
Involvement	3.39	4.19	**0.80**	3.58	3.99	**0.41**	3.74	3.99	**0.25**

Analysis of data collected using the preferred version of the MSCEI before and after transition reveals statistically significant changes registered for students' ideal classrooms in Grade 7 and Grade 8, respectively. It is important to indicate that the preferred form for Grade 8 did not differentiate on the basis of subject, as it was assumed that ideal classroom environments would be relatively constant. Table 5.5 reports the average item mean scores and average item standard deviation for the preferred from of each MSCEI scale for Grade 7 and for Grade 8. This table also provides the results of a *t* test for paired samples for differences between Grade 7 and Grade 8 preferred scores for each scale.

Table 5.5
Perceptions of Preferred Classroom Environment for Grade 7 and Grade 8 English Classes

Scale	Average Item Mean		Average Item Standard Deviation		*t*
	Grade 7	Grade 8	Grade 7	Grade 8	
Ease	3.38	3.68	0.99	0.89	-3.89**
Affiliation	4.64	4.48	0.54	0.61	3.41**
Autonomy	4.25	4.11	0.67	0.72	2.42**
Student Cohesiveness	4.50	4.27	0.55	0.61	5.38**
Teacher Support	4.20	4.22	0.66	0.67	0.42
Task Orientation	4.51	4.41	0.57	0.59	2.01
Involvement	4.19	3.99	0.64	0.72	3.58**

**$p<0.01$

Higher preferred mean scores exist for the scales of Affiliation, Autonomy, Involvement and Student Cohesiveness at Grade 7 than Grade 8, which are confirmed by statistically significant changes ($p<0.01$) across transition. Statistically significant difference exists for the scale of Ease, which had a lower preferred mean score in Grade 7 than in Grade 8 English. For the scales of Task Orientation and Teacher Support, statistically significant differences do not exist. There is insufficient basis upon which to make firm judgements about the generally reduced values in preferred environment scores in Grade 8. However, one possibility lies with diminished expectations that students have of classroom environments in secondary school. This finding provides grounds for future research and could offer further insight into transition experiences of students as they move between primary and secondary schooling.

5.3 Perceptions of Actual Classroom Environments Before and After Transition

One of the major research questions that this study aimed to investigate was the overall impact of transition to secondary school and the subsequent effect on student perceptions of the classroom environment. Casual observation of primary schools in South Australia reveals classrooms have predominantly homogenous student groups, low lesson turnover and few specialist teachers, which is in stark contrast to many lower secondary regimes where students confront integrated timetables with multiple teachers and specialist facilities. The main focus of this research was to compare and contrast student perceptions of actual classroom environment in Grade 7 and Grade 8 Mathematics and Grade 8 English to see if sizeable differences exist, and to see whether the perceptions of the classroom environment are more or less favourable.

MANOVA for repeated measures was used to test the changes across transition for the set of MSCEI scores as a whole. Because the MANOVA yielded statistically significant results for the set of MSCEI scales for both Grade 8 Mathematics and Grade 8 English, paired *t* tests were performed and interpreted for each individual MSCEI scale. The *t* test results are reported in Table 5.6.

Table 5.6 displays the average item mean and average item standard deviation for each MSCEI scale in Grade 7, Grade 8 English and Grade 8 Mathematics. The average item mean (the scale mean divided by the number of items in each scale) permits easy comparison of results for scales containing different numbers of items for the whole sample of 311 students in six different schools. Apart from the Ease scale in Grade 8 Mathematics, all MSCEI scales are perceived significantly more positively by students prior to transition into secondary schools. For both Mathematics and English, the levels of Affiliation, Autonomy, Student Cohesiveness, Teacher Support, Task

Orientation and Involvement are perceived to deteriorate across transition by the students who comprised the research sample. For English, a significant increase in Ease also occurred between Grade 7 and Grade 8. The level of belonging that students identified through the Affiliation scale decreased from an average item mean in Grade 7 of 4.52 to 4.20 and 4.25 in Grade 8 Mathematics and Grade 8 English, respectively. Similarly, the average item mean for Student Cohesiveness was 4.31 in Grade 7 and this diminished to 3.96 and 4.01 for Mathematics and English, respectively, in Grade 8. This pattern is replicated across all scales, with the exception of Ease. Whereas changes in Ease were nonsignificant for Mathematics, a significant favourable change (i.e. a increase in Ease) occurred for English.

Table 5.6
Average Item Mean and Average Item Standard Deviation for Actual Form for Each MSCEI Scale for Grade 7 and Grade 8 Mathematics and Grade 8 English, and Results of *t* Test for Paired Samples for Differences Across Transition

MSCEI Scale	Average Item Mean			Average Item Standard Deviation			*t*	
	Gr 7	Gr 8 Maths	Gr 8 Eng	Gr 7	Gr 8 Maths	Gr 8 Eng	Gr 7/ Gr 8 Maths	Gr 7/ Gr 8 Eng
Ease	3.30	3.23	3.49	0.69	0.72	0.71	1.30	-3.19**
Affiliation	4.52	4.20	4.25	0.54	0.70	0.70	6.66**	5.31**
Autonomy	3.60	3.15	3.41	0.76	0.73	0.65	7.43**	3.19**
Student Cohesiveness	4.31	3.96	4.01	0.53	0.56	0.55	8.17**	6.95**
Teacher Support	3.95	3.80	3.70	0.70	0.74	0.75	2.49**	4.06**
Task Orientation	4.29	4.02	4.04	0.57	0.59	0.58	5.24**	4.05**
Involvement	3.93	3.75	3.59	0.65	0.67	0.68	3.25**	6.33**

**$p<0.01$

It is clear from Table 5.6, that students perceive changes in the learning environment for the total sample of six schools involved in this study, with results generally indicating deleterious effects on classroom environment for both English and Mathematics for the scales of Affiliation, Autonomy, Student Cohesiveness, Teacher Support and Involvement. This supports earlier research (Feldlaufer, Midgley & Eccles, 1988; Ferguson & Fraser, 1996, 1998) which detected specific changes in perceptions of the learning environment across transition, although different scales and analyses were used. This represents important findings, for they consistently confirm the diminished perceptions of classroom environment for Grade 8 Mathematics and Grade 8 English classes, when compared to the perceptions of classroom environment for the same students before transition to secondary school. For the Ease scale, a statistically significant change (i.e. an increase in Ease scores) occurred across transition for English, but not for Mathematics.

Figure 5.4 illustrates the higher average item mean scores for each scale of the MSCEI in Grade 7 classrooms, when compared to the average item mean for Grade 8 Mathematics and Grade 8 English. The graph demonstrates that the values for Affiliation, Student Cohesiveness, Teacher Support, Task Orientation and Involvement are relatively close for Grade 8 Mathematics and English, but substantially beneath the those for Grade 7. While there is a noticeable difference between perceptions of Autonomy in Grade 8 Mathematics and English classes, it is still well below the average item mean for Grade 7. Differences in perceptions of classroom environment exist in Grade 8 English and Grade 8 Mathematics, and these are consistently smaller than differences between Grade 7 and Grade 8.

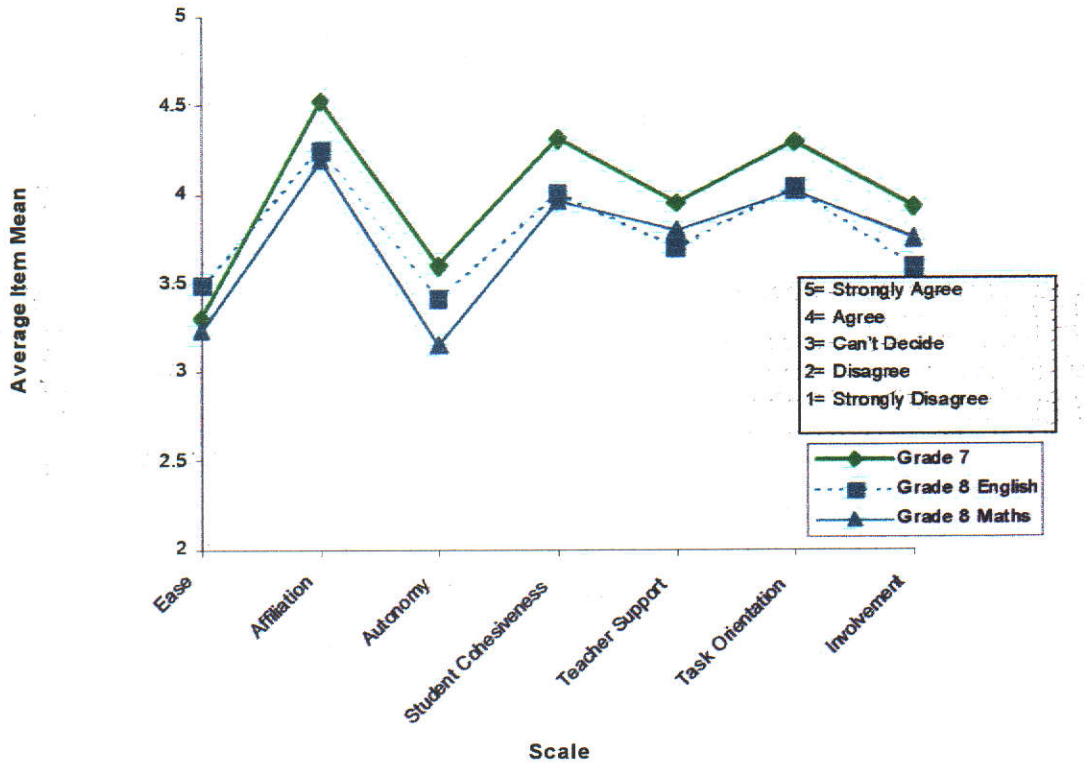

Figure 5.4 Average Item Mean for Actual Form of the MSCEI Scales for Grade 7, Grade 8 Mathematics and Grade 8 English

5.3.1 Differential Changes for Different Schools in Actual Learning Environment Perceptions Across Transition

Up to now, this section has focussed on average changes in preferred and actual classroom environment for the sample as a whole. It is possible to represent differential changes for different schools in students' perceptions of the actual classroom environment in both Grade 8 Mathematics and Grade 8 English by deducting the average item mean scores for Grade 8 from those of Grade 7 on the actual from of the MSCEI. Figure 5.5 illustrates the change in average item mean across transition for Mathematics for each actual environment scale. This graph displays the aggregated

result for students in all schools in the sample, as well as for two individual schools which formed part of the sample.

The findings are both interesting and disturbing. Aggregated student perceptions of Mathematics classes across all scales indicate a deleterious change in perceptions of actual classroom environments across transition. However, there are sizeable variations in the size of the change in student perceptions of classroom environment across transition for different scales, with scales such as Autonomy, Student Cohesiveness and Affiliation indicating substantial changes (>-0.30), while Ease (-0.06), Teacher Support (-0.15) and Involvement (-0.18) have smaller changes. Across the whole sample, however, every scale on the MSCEI was perceived less favourably in Grade 8 than in Grade 7.

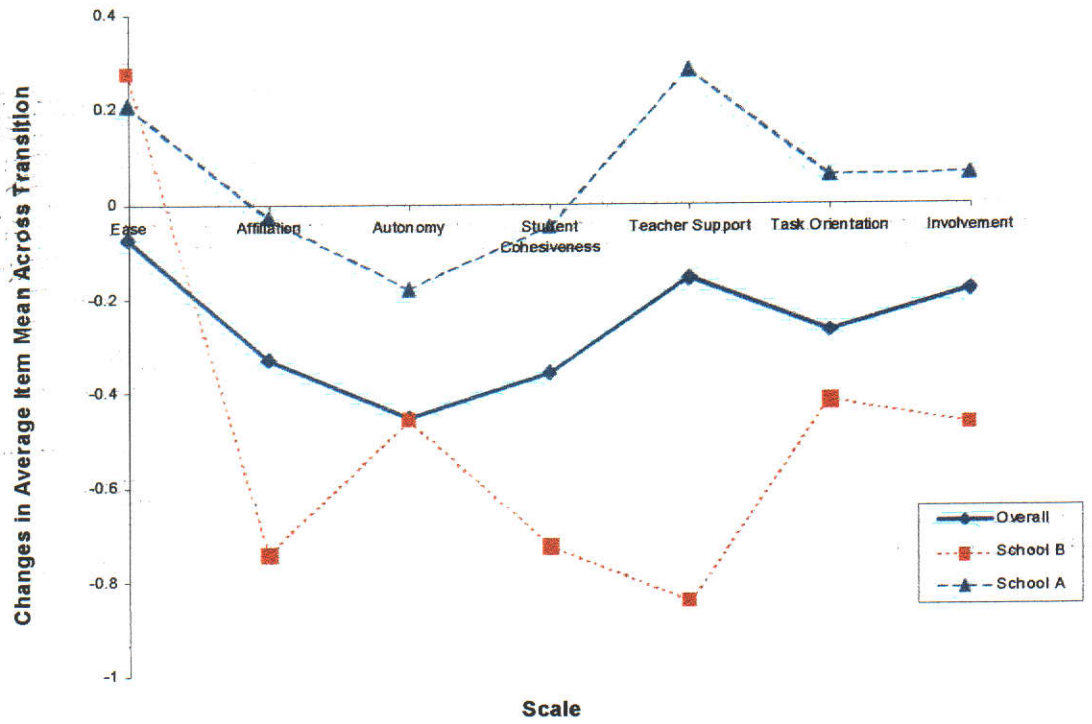

Figure 5.5 Differential Changes in Actual Learning Environment Perceptions Across Transition for Mathematics for the Total Sample and Two Selected Schools

The two schools used for comparison show very different profiles of transition (Figure 5.5). Students in School A experienced relatively favourable changes during transition in their perception of Mathematics classes. In contrast, in School B, students reported very negative perceptions of their Mathematics classroom environment in Grade 8 when compared to Grade 7.

For the scales of Teacher Support, Task Orientation, Ease and Involvement, Figure 5.5 indicates that students in School A perceived Mathematics classes more favourably in Grade 8 than Grade 7. Teacher Support has the largest improvement for students in School A (>0.20), while Task Orientation, Ease and Involvement have less sizeable but positive improvement (<0.10). In School A, students reported decreases across transition in perceptions of Autonomy, Affiliation and Student Cohesiveness.

Changes in perceptions of classroom environment during transition in School B present a very disconcerting picture. Very large measures differences (>-0.70) exist for Mathematics classes for the scales of Affiliation, Student Cohesiveness and Teacher Support, with smaller but nonetheless sizeable negative differences (>-0.40) for the scales of Autonomy, Task Orientation and Involvement. These differences in students' perceptions of MSCEI scales in Grade 8 Mathematics classes relative to Grade 7 are discussed in context of the qualitative data in Chapter 6.

Similar information about differential changes of the actual learning environment between Grade 8 classes and Grade 7 classes is shown in Figure 5.6 for English. The trend for English is similar to that for Mathematics classrooms. Apart from the scale of Ease, aggregated student perceptions of classroom environment for Grade 8 English were generally lower (<-0.20) for all scales on the MSCEI than in Grade 7.

Figure 5.6 indicates that the pattern of differential perceptions of actual environment which was established in the two sample schools for Grade 8 Mathematics is similar for Grade 8 English. Students in School A report a fairly high level of congruence

between Grade 7 and Grade 8 English classrooms, with scales of Affiliation, Student Cohesiveness, Teacher Support and Task Orientation being associated with changes in perceptions of less than 0.10 across transition. For the scale of Autonomy a sizeable positive change in perceptions of the actual environment is reported (>0.20) while, for the scale of Involvement an equally sizeable deterioration is evident (>-0.20).

The profile for School B in Grade 8 English is not dissimilar to that for Grade 8 Mathematics. Figure 5.6 shows very large deteriorations in perceptions of the actual environment (>-0.50) across transition for all scales on the MSCEI, with the exception of Ease (for which the change is negligible). These results are discussed in detail in context of the qualitative data in Chapter 6.

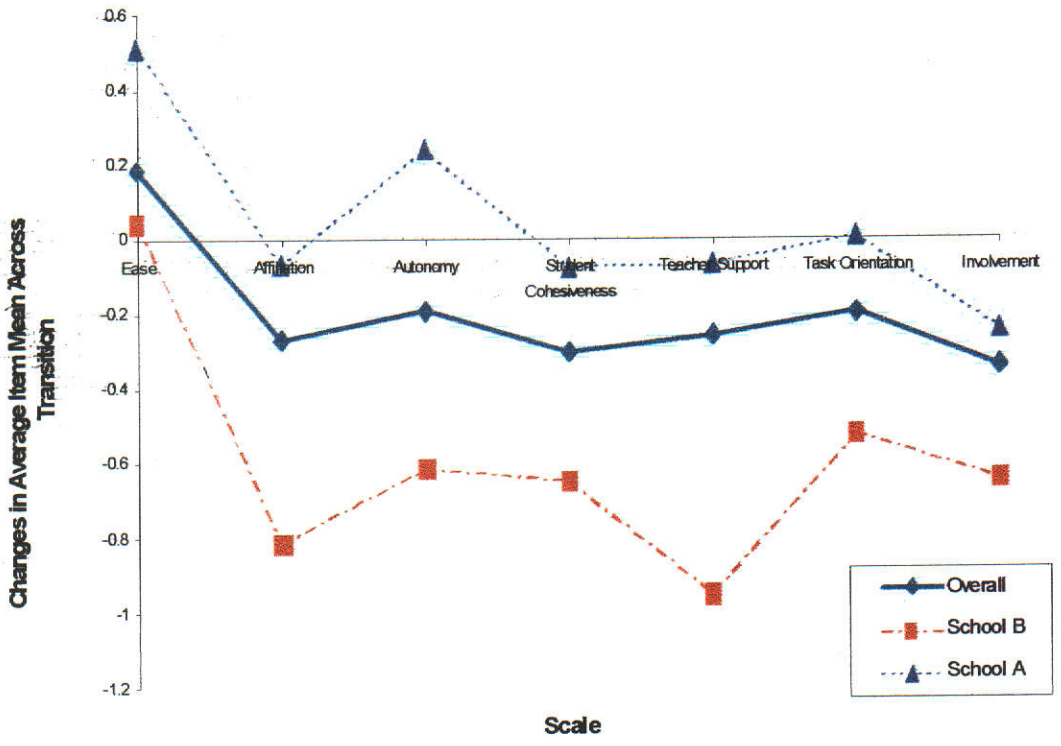

Figure 5.6 Differential Changes of Actual Perceptions Across Transition for Grade 8 English for the Total Sample and Two Selected Schools

In summary, aggregated perceptions of classroom environment in Grade 8 Mathematics and Grade 8 English classes are more negative on the scales of the MSCEI than in Grade 7. For the 311 students involved in the sample, perceptions of the classroom environment in Grade 8 Mathematics and Grade 8 English classes have deteriorated for all scales, with the exception of Ease in Grade 8 English. The two schools used for comparison in both English and Mathematics classes had quite distinct perceptions of the actual environment. Students from School A reported more favourable changes on the classroom environment scales of Teacher Support, Task Orientation and Involvement in Mathematics classes, and they viewed the changes in Grade 8 English classes favourably for the scale of Autonomy. Positive views of changes in Teacher Support that were so apparent in Mathematics classes in School A were not replicated in English. In general terms, the changes in perceptions of English classes were less positive than for Mathematics in Grade 8.

Results for student perceptions of actual environment in School B for English show a much more consistent pattern than those for Mathematics classes. For all classroom environment scales except Ease, there was a noticeable and consistent diminution in perceptions of actual environment across transition, which is discussed further in Chapter 6, which reports qualitative data.

5.4 Associations Between Student Satisfaction and MSCEI Classroom Environment Scales

Another important focus of this research was to investigate associations between Satisfaction as a dependent variable with the classroom environment scales in the MSCEI. While high levels of classroom environment dimensions such as Affiliation, Autonomy, Student Cohesiveness, Teacher Support, Task Orientation and Involvement, coupled with higher levels of Ease, are likely to correlate with student Satisfaction, it is possible that particular scales are more strongly associated with student Satisfaction

than others during the specific phase of middle schooling. The use of Satisfaction as a dependent variable has been common to a number of studies of classroom environment in the past (Anderson & Walberg, 1974; Fisher & Fraser, 1981; Fraser, 1981a; Fraser & Walberg, 1981; Haertel, Walberg & Haertel, 1981; Randhawa & Fu, 1973; Walberg, 1976, 1979; Walberg & Haertel, 1980).

Table 5.7 reports the alpha reliability for student Satisfaction for two units of analysis, for the student sample of 311 students in Grade 7 and 575 students in Grade 8. Alpha reliabilities for Satisfaction using the class as the unit of analysis were 0.90 for Grade 7 and 0.87 and 0.82 for English and Mathematics, respectively, in Grade 8. Using the individual as the unit of analysis, the reliability for Grade 7 was 0.90, and was 0.79 and 0.78 for English and Mathematics, respectively, in Grade 8. These values, reported in Table 5.7, indicate good internal consistency reliability for the Satisfaction scale.

Table 5.7
Reliability of Satisfaction Scale for Two Units of Analysis

Unit of Analysis	Alpha Reliability		
	Grade 7	Grade 8 English	Grade 8 Mathematics
Individual	0.90	0.79	0.78
Class	0.90	0.87	0.82

Table 5.8 reports results of simple correlation and multiple regression analyses. The statistics provided are the simple correlation, standardised regression coefficient and multiple correlations between the Satisfaction scale and the seven classroom environment scales in the actual form of the MSCEI for the two units of analysis (the student and the class mean). Data are reported separately for Grade 7, Grade 8 English

and Grade 8 Mathematics. Multiple correlation analyses provide information about which classroom environment scales on the MSCEI were most strongly and independently correlated with the Satisfaction scale.

Table 5.8
Simple Correlation and Multiple Regression Analyses Involving Student Satisfaction and the Actual Form of Each MSCEI Scale for Two Units of Analysis

Scale	Unit of Analysis	Simple Correlation (r)			Standardised Regression Coefficient (β)		
		Grade 7	Grade 8 English	Grade 8 Mathematics	Grade 7	Grade 8 English	Grade 8 Mathematics
Ease	Individual	0.02	0.25**	0.28**	-0.07	-0.00	0.03
	Class	0.33	0.21	0.38*	0.21	-0.01	-0.01
Affiliation	Individual	0.67**	0.63**	0.60**	0.52**	0.39**	0.36**
	Class	0.78**	0.91**	0.88**	0.33**	0.68**	0.56**
Autonomy	Individual	0.41**	0.38**	0.41**	0.24**	0.01	0.13**
	Class	0.82**	0.64**	0.57**	0.10	0.13**	0.32**
Student Cohesiveness	Individual	0.46**	0.42**	0.41**	0.03	-0.02	-0.02
	Class	0.55**	0.56**	0.62**	0.07	-0.07	0.05
Teacher Support	Individual	0.58**	0.63**	0.56**	0.18	0.36**	0.23**
	Class	0.98**	0.83**	0.81**	0.46	0.37	0.41*
Task Orientation	Individual	0.41**	0.47**	0.50**	-0.01	0.04	0.10*
	Class	0.68**	0.59**	0.53**	0.12	-0.20	-0.24
Involvement	Individual	0.42**	0.48**	0.44**	0.04	0.07	0.06
	Class	0.50**	0.59**	0.61**	0.08	0.03	-0.05
Multiple Correlation (R)	Individual				0.77**	0.72**	0.69**
	Class				0.94**	0.93**	0.93**

*p <0.05 **p < 0.01

Table 5.8 shows that there was a statistically significant simple correlation with Satisfaction for every MSCEI scale except Ease, for two units of analysis, and for Grade 7, Grade 8 English and Grade 8 Mathematics. This is not unexpected as classrooms that are perceived to have adequate levels of Affiliation, Autonomy, Involvement, Student Cohesiveness, Task Orientation and Teacher Support and manageable levels of Ease are likely to satisfy students. The Ease scale has a statistically significant simple correlation for Grade 8 English and Mathematics using the student as the unit of analysis, but not for Grade 7. Using the class as the unit of analysis, a statistically significant simple correlation with Ease exists for Grade 8 Mathematics but not for Grade 7 or Grade 8 English.

The multiple correlation (R) reported in Table 5.8 for the set of seven MSCEI scales was statistically significant ($p<0.01$) for Grade 7 data, the Grade 8 English data and the Grade 8 Mathematics data for two units of analysis. For Grade 7 classes, the multiple correlation was 0.77 for the individual as the unit of analysis and 0.94 for the class mean. For Grade 8 English classes, the multiple correlation was 0.72 for the individual and 0.93 for the class mean. In Grade 8 Mathematics classes, the multiple correlation was 0.69 for the individual and 0.93 for the class mean.

To identify which classroom environment scales contributed most to the variance in student Satisfaction, the standardised regression weights (ß) were examined. Table 5.8 shows that the three MSCEI scales that were the strongest independent predictors of student Satisfaction were Affiliation, Autonomy and Teacher Support. For Affiliation, the regression coefficient was statistically significant for Grade 7, Grade 8 English and Grade 8 Mathematics and for two units of analysis. For Autonomy, the regression coefficient was statistically significant for Grade 7 at the student level, for Grade 8 English at the class level, and for Grade 8 Mathematics at both levels of analysis. For Teacher Support, the regression coefficient was significant for Grade 8 English at the student level and for Grade 8 Mathematics at both levels of analysis. As well, Task Orientation was a significant independent predictor of Satisfaction for Grade 8

Mathematics at the student level. The Ease, Involvement and Student Cohesiveness scales were not significant independent predictors of Satisfaction at either level. These multiple regression results are important because they provide information about which MSCEI scales are related to Satisfaction when all other MSCEI scales are mutually controlled.

This represents an important finding, and one that is particularly pertinent to the perceptions of classroom environments in Grade 8, given previous research into middle schooling. Findings of the National Middle Schooling Project (Barratt, 1998 – see Section 2.7), coupled with research by Cormack (1996), support the importance of identity or sense of belonging during adolescence. Results for the MSCEI suggest that classroom environments that have a sense of Affiliation are strongly associated with student Satisfaction. Eyers, Cormack and Barratt (1993) exhort the need for students in middle school to be given opportunities to grow in independence and autonomy, which confirms the importance of the Autonomy scale as a barometer of student Satisfaction in classroom environment studies. Similarly, Ferguson and Fraser's (1996) research into students in transition between primary and secondary schooling revealed decreased levels of Teacher Support across transition, which is likely to result in reduced student Satisfaction, given the associations found with the MSCEI in this study.

5.5 Conclusion

This chapter has addressed four key research questions. Section 5.2 reported and discussed differences between actual and preferred classroom environments in Grade 7, Grade 8 English and Grade 8 Mathematics classes. Section 5.3 reported changes in actual classroom environment during the transition form Grade 7 to Grade 8, and Section 5.4 reported associations between Satisfaction and the other classroom environment scales of the MSCEI.

Aggregated results of quantitative data that measured differences between students' actual and preferred perceptions of classroom environment in Grade 7 and Grade 8 yielded interesting findings. Average item mean scores for each environment scale on the MSCEI indicated sizeable differences between the types of environments that students prefer and the classroom environments to which they were exposed, at both Grade 7 and Grade 8. This was reflected not only in the average item mean scores for each of the scales on the MSCEI, but also through calculation of effect sizes and use of *t* tests for paired samples. While there were points of commonality between the overarching perceptions of actual and preferred environments, individual differences were noticed between different MSCEI scales and between preferred environments in Mathematics and English classes in Grade 8. In comparing the three data sets (namely, Grade 7, Grade 8 English and Grade 8 Mathematics), the scales of Autonomy, Involvement, Student Cohesiveness and Teacher Support showed sizeable differences between actual and preferred classroom environments in each case, with a smaller level of difference in the Affiliation and Ease scales in Grade 8 English. The larger magnitude of difference between actual and preferred classroom environments in Grade 8 when compared to Grade 7 classrooms suggests that students perceive less favourable classroom environments in Mathematics and English in Grade 8 relative to those experienced in Grade 7. These findings address the first two research questions involving whether:

- sizeable and consistent differences exist between actual and preferred environments in Grade 7, in Grade 8 English and in Grade 8 Mathematics classrooms,
- differences between actual and preferred environments for the classroom dimensions assessed by the MSCEI are accentuated by the transition to secondary school.

In addition, diminished student perceptions of preferred classroom environments in Grade 8 existed from those in Grade 7, which presents grounds for further research into

why students' perceptions of ideal classrooms alter between different levels of schooling.

Section 5.3 reported analyses of student perceptions of actual classroom environment in Grade 7 and Grade 8, to determine whether the transition to secondary school resulted in more or less favourable impressions of classroom environment dimensions as measured by the MSCEI. Quantitative data generally revealed deleterious effects of transition between primary and secondary schooling for the students involved in the sample. This was the case for all scales included in the questionnaire with the exception of Ease in Grade 8 Mathematics, which had a fractionally reduced level (0.06) of Ease. A sizeable diminution in student perceptions of Affiliation, Autonomy, Student Cohesiveness, Involvement, Task Orientation and Teacher Support was common for both English and Mathematics classes in Grade 8 when compared to the perceptions for the same scales in Grade 7. Figure 5.5 and Figure 5.6 highlight the diminished perceptions of actual classroom environments for Grade 8 English and Grade 8 Mathematics, when compared to Grade 7. In summary, descriptive statistics and figures presented in Section 5.3 suggest that:

- students in the research sample had different perceptions of classroom environments in Grade 8 from those in Grade 7.
- students hold consistently less favourable perceptions of the environment scales on the MSCEI after transition to secondary school.

This represents an important finding that corroborates earlier studies of students in transition to secondary school (Feldlaufer, Midgley & Eccles, 1988; Ferguson, 1996, Ferguson & Fraser; 1998).

Section 5.4 addressed the fifth research question involving associations between Satisfaction and the seven classroom environment scales on the MSCEI. Simple correlation analyses revealed statistically significant associations between Satisfaction

and each of the six classroom environment scales using the individual and the class as the unit of analysis, with Ease revealing weaker associations. Standardised regression weights indicated that the strongest independent predictors of student Satisfaction were Affiliation, Autonomy and Teacher Support. For Autonomy, regression coefficients were statistically significant for the three data sets in Grade 7, Grade 8 Mathematics and Grade 8 English for the two units of analysis. For Autonomy, the regression coefficient was statistically significant for Grade 7 at the student level, for Grade 8 English at the class level, and for Grade 8 Mathematics at both levels of analysis. Teacher Support had regression coefficients that were statistically significant for Grade 8 English at the student level, and for Grade 8 Mathematics at both levels of analysis. In addition, Task Orientation was a significant independent predictor of Satisfaction for Grade 8 Mathematics at the student level. The other scales on the MSCEI were not independent significant predictors of Satisfaction at either level.

This addresses the fifth research question and indicates that particular classroom environment scales such as Affiliation, Teacher Support and Autonomy are closely associated with student Satisfaction in Grade 7 and Grade 8. This also represents an important finding, as these dimensions of classroom environment could provide the basis for greater articulation between primary and secondary classrooms and, in the process, provide more favourable transition experiences for students.

CHAPTER 6

Qualitative Data: A Profile of Four Schools

6.1 Introduction

As outlined in Section 3.4, qualitative data gathering accompanied the administration of the questionnaire at the two phases of data collection, namely, during the final term of Grade 7 and half way through Grade 8 in the following year. Classroom observation of Mathematics and English classes in the six sample schools produced a corpus of information about pedagogical emphases and pastoral care arrangements that were employed in each respective school. In addition, discussions with teachers and administrators elicited information about the site-specific structures and methods used to assist students in the transition from Grade 7 to Grade 8. Qualitative data were gathered to see if particular teaching methodologies and emphases at the classroom level could explain different environments, as well as to see if particular structures developed by the school produced a greater articulation between classroom environments in Grade 7 and Grade 8, respectively.

Chapter 5 reported and discussed findings associated with the administration of the MSCEI. This chapter discusses individual school profiles of changes in students' perceptions of learning environment for four schools involved in the research sample. Qualitative data are triangulated against the quantitative results from MSCEI to enhance interpretation of perceptions associated with certain scales. It became clear that there were sizeable variations in between-school differences in the size of change across transition, largely as a result of school context, approaches to pedagogy, and structural arrangements that are undertaken to manage students in transition, together

with a number of other issues that form part of the internal management of students in Grade 7 and Grade 8, respectively.

Section 6.2 briefly reports and discusses the variations in perceptual changes in classroom environment across transition for four of the six schools in the research sample. Section 6.3 discusses the qualitative data from School A, which is a single-sex boys school that utilises a number of contemporary middle schooling practices. Qualitative data extracted from School A are analysed in the context of the average item mean scores for each scale of the MSCEI measured across transition. Section 6.4 discusses the qualitative data in context of the quantitative data for School B, which is a co-educational school that has adopted some novel strategies to manage students in the transition through the middle school. Section 6.5 evaluates the qualitative and quantitative data gathered from School C, which is a single-sex girls' school that uses team teaching arrangements in Grade 7, and a relatively traditional approach to secondary school in Grade 8. Section 6.6 triangulates qualitative and quantitative data for School D, which is a co-educational school that utilises the principles of constructivist teaching and learning methodologies in Grade 7 and Grade 8 classrooms. Section 6.7 draws some tentative conclusions based upon the interpretation of the qualitative and quantitative data presented throughout the chapter.

6.2 Comparison of Four Individual School Profiles of Transition

Figure 6.1 illustrates the differential changes in learning environment perceptions across transition for the scales on the MSCEI for four schools involved in the sample. The values in the graph were calculated by averaging the item mean for each scale for Mathematics and English in Grade 8 and deducting it from the item mean for the same scale in Grade 7. Figure 6.1 illustrates that students in School A experience the most seamless transition, with a large measure of congruence being perceived between classroom environments in Grade 7 and Grade 8. Students in School B perceive a

considerable deterioration in actual classroom environment during the transition to secondary school, with very large differences in every scale on the MSCEI. Perceptions of classroom environment for students in School C diminish considerably across transition but, as will be explained in greater detail in Section 6.5.4, this is partly as a result of the extremely positive perceptions of the classroom environment held in Grade 7 under a team teaching regime. Students in School D, who are exposed to constructivist teaching and learning methodologies, perceive a relative improvement in classroom environment in Grade 8 for the scales of Autonomy, Teacher Support, Task Orientation, Ease and Involvement compared to Grade 7, and lower levels of Student Cohesiveness and Affiliation. These findings are discussed in detail in the context of each respective school and qualitative data in the following chapter.

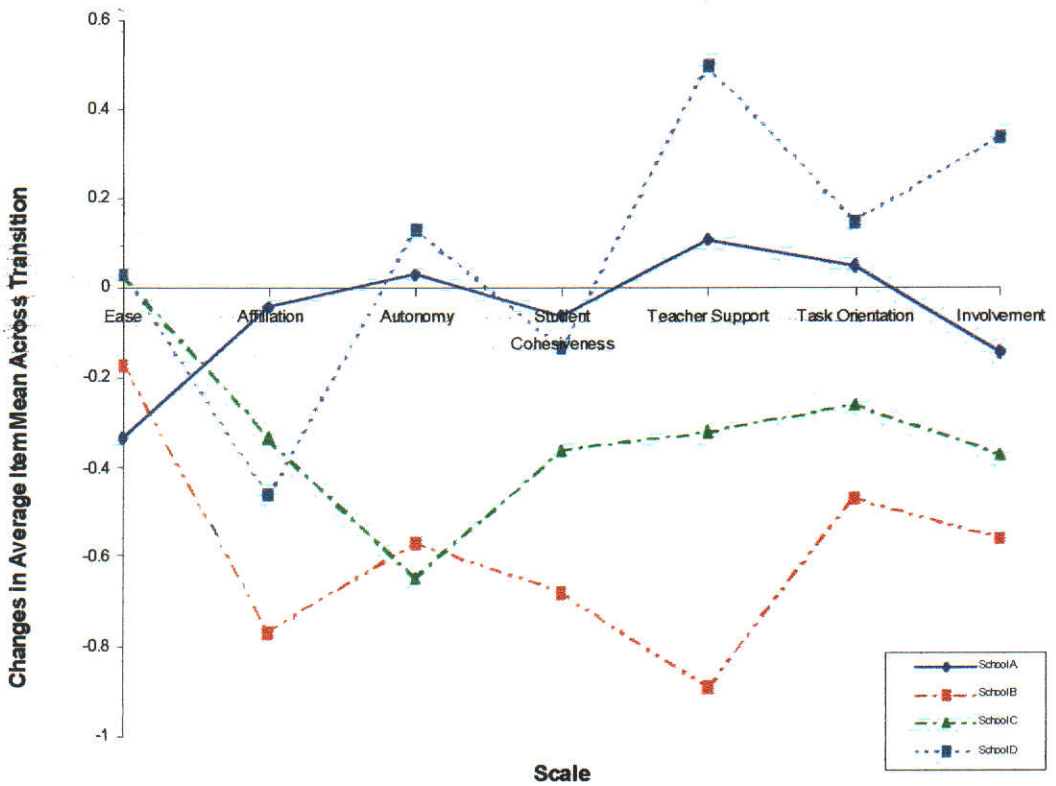

Figure 6.1 Differential Changes in Learning Environment Perceptions Across Transition for Four Selected Schools

6.3 School A

School A indicated a more positive transition experience for students than other schools involved in the sample. Students in School A experience improvements in classroom environment for the scales of Teacher Support, Autonomy and Task Orientation, with smaller declines than in other schools in scales for the Affiliation, Ease, Student Cohesiveness and Involvement (see Figure 6.1). Reference to qualitative data collected during pre- and post-transition visits assists in interpreting and explaining the relatively positive differential perceptions of the students in School A and why the transition to secondary school provided minimal disjuncture when compared to the profiles of changes in perceptions across transition in other schools involved in the research.

6.3.1 Context of School A

School A is a Catholic, single-sex boys' school that is highly regarded in the metropolitan region of Adelaide. It boasts a rich denominational tradition of education throughout the world and has established a solid reputation for boys' education for nearly half a century. Students in School A generally come from families that have reasonably comfortable financial circumstances, high expectations for their son's education, and a willingness to contribute to the life of the school through involvement in sport, social functions, and so on.

Across the Grade 3 to Grade 12 enrolment, the school has approximately 1,000 students on a small geographical site that is segmented into 'primary' and 'secondary' domains. The two distinct conceptual divisions of the school serve a number of purposes — most important of which is the sacred space of the primary school area, which is regarded as out of bounds to secondary students. The rationale for the separation is essentially pragmatic and relates to the management of boys and boys' education: older boys, physically bigger and more inclined towards boisterous play,

present a hazard to younger and more frail primary students. This provision provides something of an insight into the school itself, which possesses an abiding concern for student welfare and makes a concerted effort to attend to student needs at all levels.

While a conceptual divide between the primary and secondary section of the school exists, an overlaid middle schooling structure has been implemented to manage students moving between Grade 6 and Grade 9. Elements of this philosophy exist in both Grade 6 and Grade 9, but the focus of the program is directed at students involved in the transition between Grade 7 and Grade 8.

6.3.2 Structural Response to Middle Schooling in School A

In response to the emerging literature and research into middle schooling, School A appointed a Middle School Coordinator in 1997. The individual concerned is a highly motivated and concerned educator who is not only familiar with many of the issues that have been the object of much contemporary research, but was deeply committed to their implementation in the school. While considerable support for middle schooling was given by the Executive and Administration of the school, the internal educational provision and arrangements introduced in 1997 were largely the preserve of the Coordinator. It is worth mentioning that data gathering for this research was conducted at an early stage of development of the middle schooling philosophy at School A, when considerable energy and enthusiasm for an alternative way of dealing with adolescent education was being embraced. This was established through a number of discussions with the person concerned who not only held a deep personal commitment to middle schooling but also had a discerning vision about the imperatives of middle school education.

The Coordinator was responsible for liaison with the Deputy Principals of both the primary and secondary schools with a view to implementing the principles of middle

schooling between Grade 6 and Grade 9. Two key structural issues were undertaken in order to present optimum educational provision for students in the grades concerned and, in the process, provide an effective transition experience into secondary school:

- *Key Teachers in Grade 8.* Key teachers were appointed to avoid the large number of specialist teachers and rapid lesson turnover that is often characteristic of secondary schools. Teachers were invited to apply for these roles or were seconded by the administration because of their ability to form relationships with students. Key teachers were appointed to the core subjects in Grade 8, including Mathematics, English, Science and Society and Environment, with the intention of creating a more personalised environment by 'knowing' the students as individuals in Grade 8 and implementing more common approaches to managing students at the classroom level. Concurrently, modifications were made to the Grade 7 framework by class teachers being asked to become involved in the delivery of another subject to another Grade 7 class in order to begin to expose students to a broader range of teachers prior to transition to secondary school.

- *Meeting structures involving Key Teachers in Grade 8 with the Coordinator.* Formal meetings were timetabled and conducted on a weekly basis to ensure that a common ethos was being embraced and was consistently conveyed to students in the classroom. While some Key Teachers were not always supportive of the meetings and some had misgivings about aspects of the middle schooling framework that was being adopted, there was a deep professional respect for the Coordinator and a willingness to contribute positively to student learning. This aspect of the structure undertaken by School A is congruent with one of the recommendations of the National Middle Schooling Project (see Section 2.7), which advocated collaborative organisation for purposes of curriculum delivery, creation of partnerships and the development of inclusive programs pertinent to the needs of adolescents.

In addition to the appointment of a Coordinator, School A developed a small group of Key Teachers who were responsible for the delivery of a range of subjects, formalised meeting schedules, and cultivated a middle schooling ethos among the teachers who work with the students in transition. It is not surprising that a generally positive transition experience, based upon perceptions of classroom environment, was prevalent for students in School A, particularly for the scales of Teacher Support and Task Orientation, relative to the mean for all students in Grade 8 (see Figure 5.5 and Figure 5.6). In comparison to students in some other schools in the sample (see Figure 6.1), students in School A had a reasonably congruent set of classroom environment experiences between Grade 7 and Grade 8. Considerable energy had been devoted towards reducing the total number of teachers in Grade 8, in an attempt to personalise the environment, and replicate the kind of classroom experience to which students were exposed in Grade 7. Classroom visits to School A reinforced this, with teachers knowing the names of students and using them frequently, occasionally resorting to humour to break up lesson delivery and engage students more fully in the lesson. In the Grade 8 Mathematics class, the teacher was obviously well known and liked by the students, and he often used nick-names to address students, which seemed to create a more personal and familiar environment.

Classroom visits to both Grade 7 and Grade 8 classrooms before and after transition revealed that a prevailing view of classroom management existed in School A. This was easily identified by teacher responses to discipline issues, particularly as School A has a withdrawal room policy that is utilised by the teachers and seemingly is respected by the students. Generally, teachers held clear expectations about acceptable standards of student behaviour and response to lesson activities. This created classrooms where students were ostensibly willing to accept admonishment when they transgressed. During a visit to a Grade 8 Mathematics class, a student had his name 'black-boarded' for not responding to a teacher's request quickly enough. When spoken to after the instructional stage of the lesson, the student admitted that he was 'messing around' and that he had been admonished on previous occasions about the matter, harbouring no

resentment towards the teacher. Classroom observations made it clear that students have high expectations to meet, that a structured and orderly environment was provided, and that specific consequences were incurred for failure to meet established standards. This not only supports recent recommendations into middle schooling associated with classroom rigour and high expectations, but goes some way towards explaining the improvement of Task Orientation scores across transition (see Figure 6.1).

In addition to a shared view of classroom expectations and response to student management, an emphasis on group work activities as well as individual work was facilitated to engender greater levels of cooperative student learning. While only observed in a Grade 7 Religious Education class and a Grade 8 English class, it was clear in discussions with teachers and the Coordinator that structured group work is a standard pedagogical feature of upper primary and lower secondary classrooms at School A. Because of the consistency adopted from one year to the next, it is not surprising that students in School A experience relatively few discontinuities and disjunctures in their movement between Grade 7 and Grade 8, and that therefore they have reasonably favourable perceptions of classroom environments after the transition experience.

6.3.3 Pastoral Care in School A

A major concern of the administration at School A, one that pervades the whole school as much as it affects students in Grades 7 and 8, is the attention given to student welfare and pastoral care. This is a matter of ethos that holds students as the epicentre of the education equation, as much as a structural matter that aims to develop meaningful relationships between teachers and students. What are referred to as 'admin groups' in many schools are labeled as 'tutor groups' in School A. Teachers meet with the students each morning and evening for a short period, as well as once per

fortnight for an extended period of time to attend to administrative matters and to keep teachers informed about the personal development of the students entrusted to their care. A number of the House Tutors in Grade 8 are also subject teachers, so there is a healthy interplay between the instructional aspects of teaching and learning as well as the formation of relationships between students and teachers. The degree of knowledge that a teacher had about one student in a Grade 8 Mathematics class was evident when the teacher referred to the goal that the student had scored in a football game over the weekend, in order to make a point about geometry. The student was delighted by the reference to his performance and felt obviously ennobled in front of his peers. When the observer talked to the teacher about this event after the lesson, he didn't see it as anything exceptional, but the knowledge of recent events in the life of the student was well received by the person concerned, and it had the added benefit of making the atmosphere of the classroom more personable and relational, which engaged the whole class in the explanation of angles in geometry.

6.3.4 Additional Qualitative Findings

Perhaps because School A is a single-sex boys' school, there was little difference in the physical environment of the classrooms between Grade 7 and Grade 8. In a number of co-educational schools, as well as the single-sex girls' school, noticeable variations existed in the highly decorative and colourful classrooms of Grade 7 as distinct from the more austere and 'clinical' presentation of Grade 8 classrooms. School A has noticeably less adornment of the classroom environment in Grade 7, with fewer posters, displays and student work in the classroom. This is partly as a result of students being substantially based in the one room in School A and partly as a result of the observation that boys seem to devote less emphasis to the presentation of their work in the classroom than was evident in co-educational or single-sex girls' schools. Nevertheless, a noticeable feature about School A was that the transfer to the physical

environment of Grade 8 held little by way of difference to the appearance of the rooms in Grade 7.

Discussion with a number of students in School A in Grade 7 revealed that they were excited about the prospect of entering Grade 8 and secondary school. This was particularly related to a wider range of subjects to which they would be exposed and access to the specialist facilities that they had been largely denied in primary school. According to one student, but reflective of others — "I really like Science in the laboratory and Physical Education in the gym". Grade 8 classrooms in School A are located adjacent to the specialist facilities, which they saw as a desirable element of the transition to secondary school. While these comments might not translate specifically to Mathematics and English classes in Grade 8, they indicate clearly that a number of students held positive anticipation of the experiences that they would encounter after leaving Grade 7.

Figure 6.2 shows the quantitative profile of mean student perceptions of actual classroom environment in Grade 7, Grade 8 English and Grade 8 Mathematics in School A. It is clear that, while certain dimensions of classroom environment alter across transition and while there are differences between Mathematics and English classes in Grade 8, there is a relatively similar view of classroom environments at the two grade levels. Scales of Teacher Support, Task Orientation and Affiliation show considerable congruence in the classroom perceptions in Grade 7 and Grade 8. Qualitative data offer some explanation of these results, suggesting that measures invoked by the school to address the educational needs of boys in the middle years have met with some success when compared to the experiences and profiles of students in some other schools involved in the research. There are some positive gains across transition in School A, particularly in more favourable perceptions of Ease and Autonomy in English and Teacher Support, Task Orientation and Ease in Mathematics. Students in School A do, however, perceive a diminution in the levels of Autonomy in Mathematics and Teacher Support and Involvement in English. The latter results can

be explained by the larger size of the cohort, which increased from 70 students in Grade 7 to 140 students in Grade 8, and by setting arrangements in Mathematics and English, whereby students are streamed into ability levels for these two subjects. The influx of a large number of students is likely to re-establish the identity of the group, and the formation of homogenous ability groupings for a couple of lessons each day is likely to break the pattern of student associations and cohesiveness.

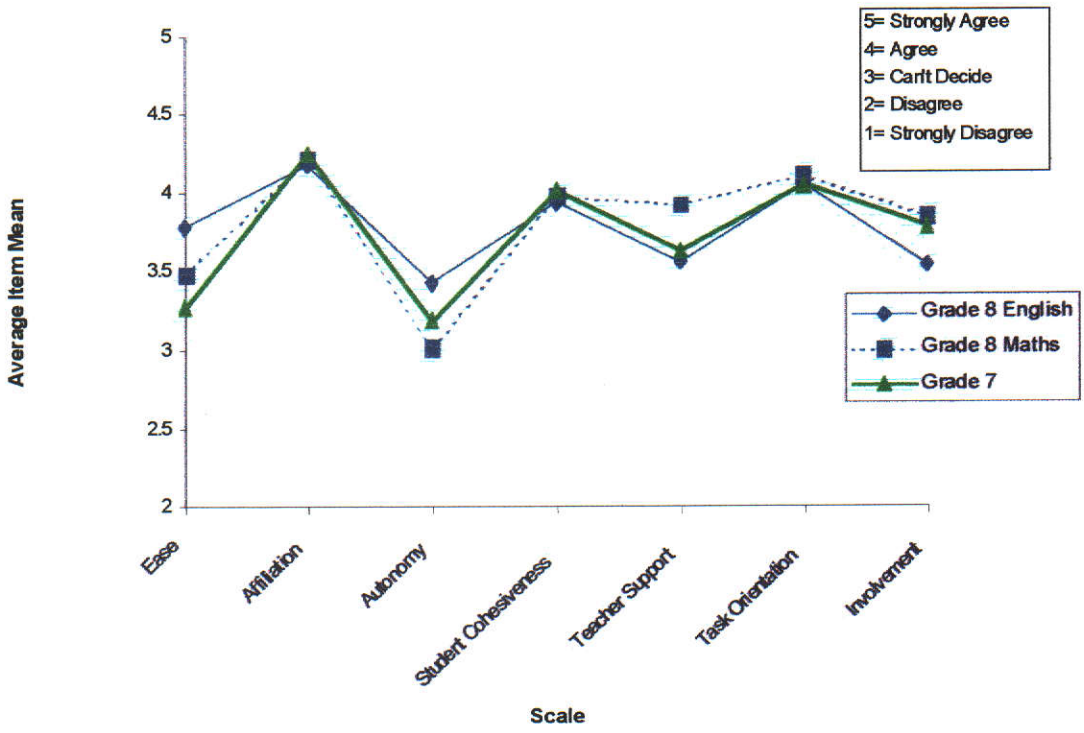

Figure 6.2 Profile of Mean Student Perceptions of Actual Classroom Environment in Grade 7, Grade 8 English and Grade 8 Mathematics in School A

It would appear that measures adopted in School A to deal with students in transition between primary and secondary school have been efficacious. An informed and passionate Coordinator of the Grade 6 to Grade 9 cohort, together with a clustered group of Key Teachers who are responsible for instructional teaching and pastoral care,

has resulted in a reasonably smooth movement from Grade 7 to Grade 8 in School A. Many of the measures adopted have been undertaken deliberately to address issues and concerns associated with adolescent education and middle schooling, and have conditioned favourable perceptions of Grade 8 classroom environments, which have a high level of congruence with those of Grade 7.

6.4 School B

Students in School B indicated the least positive transition experience from the six schools included in the research sample, with considerable differences between classroom environments being perceived between Grade 7 and Grade 8, respectively (see Figure 6.1). Perceptions of Teacher Support, Student Cohesiveness and Affiliation plummeted during transition for both Grade 8 English and Mathematics classrooms, presenting a disturbing profile and what could only be considered as a major disjuncture in the educational continuum for the students concerned (see Figure 6.3). Perceptions of Autonomy, Involvement and Task Orientation also diminished by sizeable proportions, but not quite to the same extent as for the other three environment scales.

6.4.1 Context of School B

School B is located in one of the most disadvantaged socioeconomic regions of the city. Sixty-five percent of the student population possesses School Cards, which provide extra financial assistance because the domestic income level of the families of children who attend the school is low. Detailed information about the parent clientele is not available because of the confidentiality which applies to such information, but data drawn form the Adelaide Social Atlas (1993) attests to the degree of disadvantage that families in the region incur:

- 73% of the local community over the age of 15 years possess no formal educational qualifications.
- Less than 4% of the residents hold university qualifications.
- Of those who have qualifications, 15% are trades, which is disproportionately high compared to other regions.
- 21% or less own their own residence.
- 20% to 25% of residents reside in government-owned housing.
- A medium to high migrant population (24% to 37%) forms the local community.

Students come from domestic situations where family dysfunction is not uncommon. During a visit to a Grade 6/7 classroom in the pre-transition phase of data collection, the class teacher volunteered that one of the students in the class "had three mothers in just 12 years", suggesting quite some instability in the life of the student concerned, as well as for a number of other students in the class. In addition, student and family expectations related to academic achievement at school are generally low, unemployment is higher than in many other regions of the city (11% to 25% for residents over the age of 15 years), and student retention beyond the compulsory years of education is not high. As a result, behaviour management in School B provides acute difficulties at the classroom level which is attempted to be counteracted by a codified behaviour management policy and set of widely-applied procedures and practices.

Student attitudes towards school are reflected in high staff turnover as young or beginning teachers move rather hastily from their initial placements and seek employment in more preferred schools in different regions of the metropolitan area. A long-serving administrator who has a deep attachment to the plight of the students and who personally responds to many of the behavioural difficulties that arise, informed me that 35% of the teaching staff either move or are rotated every year. This gives the school a 'transitory' population of teachers, providing major discontinuities and

adjustments at the beginning of each school year and, depending upon the adaptiveness and resilience of the teacher, untimely resignations or requests for relocation during the year. Perennial problems in attracting teachers to School B exist, given the nature of the student population and contextual issues surrounding the school.

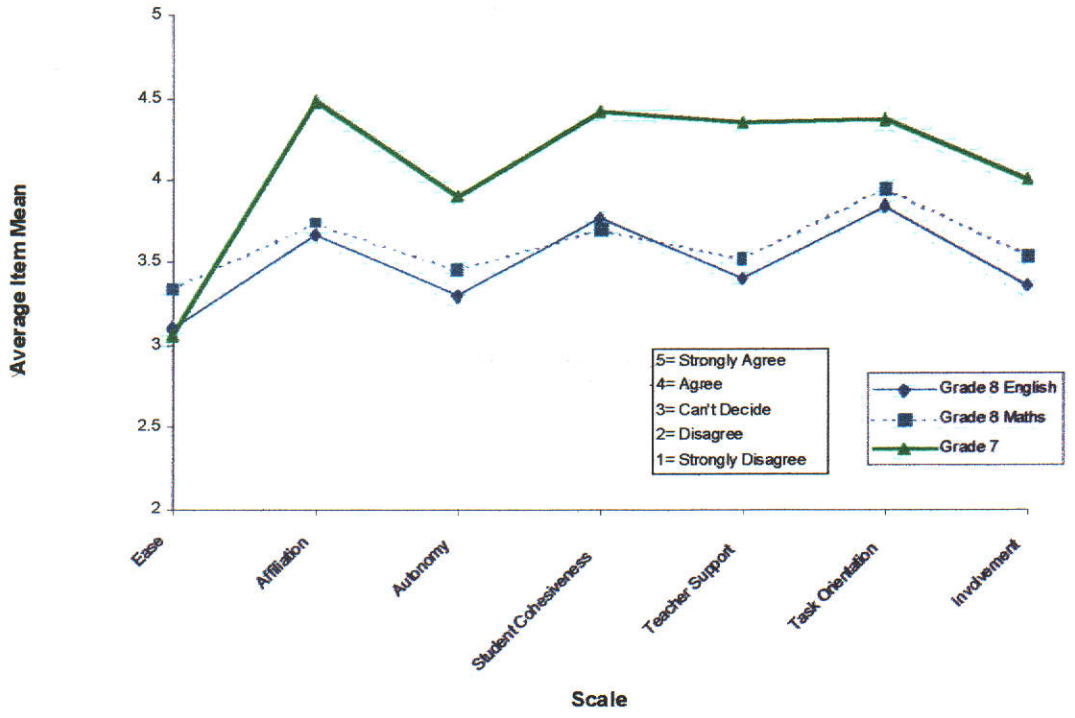

Figure 6.3 Profile of Mean Student Perceptions of Actual Classroom Environment Scales in Grade 7 and Grade 8 in School B

School B is one of the few Reception-to-Grade 12 schools of its type. It contains three discrete sub-sections — primary, middle and secondary — that are accommodated on delineated sections of the property. The primary school encompasses Reception to Grade 5, the middle school encompasses Grade 6 to Grade 9, and secondary school encompasses Grade 10 to Grade 12.

Administrators at School B have attempted to approach middle schooling in a creative and innovative way in order to address the prevailing contextual problems. It is clear that, despite the best intentions of administrators and teachers, and despite alternative approaches to improve student attitudes towards school and achievement, the outcomes of the research indicate major shortfalls in perceptions of classroom environments are magnified as students progress into the middle years, particularly between Grade 7 and Grade 8.

6.4.2 Structural Approach to Middle Schooling in School B

School B, in conjunction with one other school in metropolitan Adelaide, established a novel educational program to deal with students in transition. This was undertaken for two reasons — to respond proactively to the emerging literature and research in the 1990s associated with adolescent education and the need for more effective educational provision for students in upper primary and lower secondary school, and to address some of the prevailing contextual problems characteristic of the region.

A Middle School Coordinator was appointed to form an integrated unit of teachers to work with the students across the transition years. Like the administrator in School A, this person is a passionate and informed educator who has an abiding empathy with the students, and wishes to provide a more positive schooling environment and incline students towards achievement.

The integrated middle school unit comprises three Grade 6/7 combined classes and four Grade 8 classes. Grade 6/7 teachers work closely with the Coordinator to collaboratively plan units of work, as do the four Grade 8 teachers in the unit. In total, 120 students are part of the integrated approach to middle schooling in School B, while two other classes of Grade 8 students in the same school undertake the more traditional approach to education with individualised classroom learning. The teams of teachers in

Grade 6/7 and Grade 8 meet weekly for an hour and a half with the Coordinator to co-plan units of work and detail teaching and teacher support arrangements for students in the unit. It was clear, in speaking to both the Coordinator and the teachers, that a commitment to the principles of middle schooling and an empathy with the plight of the student body are visible and guide the operation of planning and delivery of the teaching program.

Teachers who work in the integrated unit are encouraged to have completed the middle school teacher-training program at one of the more progressive universities in South Australia. This involves induction to cooperative learning methodologies and behaviour management techniques pertinent to students in early adolescence.

Lesson blocks are 100 minutes in length in the integrated unit in School B, as distinct from the smaller lesson blocks of 45 minutes which operate in most other schools in the research sample. Three blocks of lessons are undertaken throughout the day providing 15 x 100 teaching periods across the week. These are symmetrically divided throughout the day, with recess and lunch punctuating the teaching blocks.

At strategic points of the day and across the week, students from either two or four Grade 8 classes combine for instruction and learning. Two of the Mathematics classes observed had 60 students seated in groups of six, with instruction from one of the teachers in the unit and two support teachers who roved between the groups assisting students with work, correcting errant behaviour and offering encouragement and support. At other times throughout the week, the four classes of 120 students combine with a larger number of teachers moving between the student groups to offer individual explanation of lesson content and support with difficulties when they arise. Both lessons observed had a young, recently-trained teacher in the principles of middle schooling who confidently addressed the class and provided instruction about algebra. From a technical point of view, the instructional section of the lesson was well delivered, beginning with revision of work covered in recent lessons, followed by

extension work on the concepts being presented with application to selected examples, and an invitation for students to work on sheets that had already been distributed.

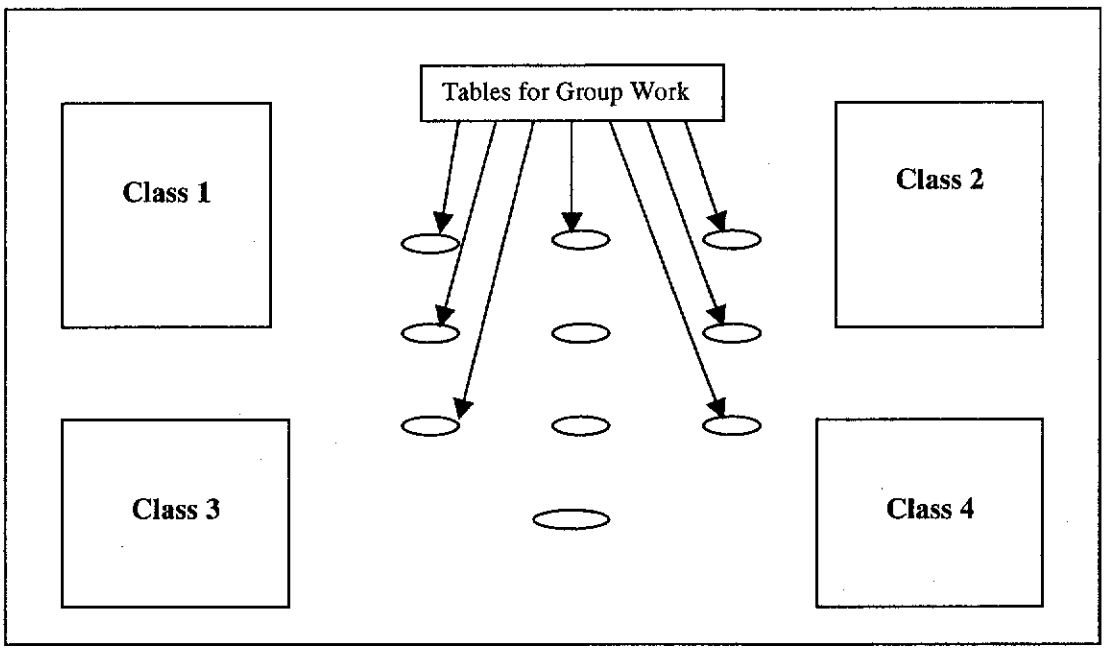

Figure 6.4 Diagrammatic View of the Integrated Unit in Grade 8 in School B, Showing Locations of Classrooms and Teaching Area for Common Instruction

A purpose-built facility is used to house the integrated unit in Grade 8 in School B (see Figure 6.4). This is an area that contains four classrooms located on the corners of the facility with a large central space that can accommodate up to 120 students. Students remain in their own classrooms for a number of lessons each day, but also have collective instruction with other classes in the larger area at designated points throughout the day or week. This is to encourage cooperative learning strategies and to

involve a number of teachers in 'roving support' of student learning after instructional teaching has occurred.

6.4.3 Lesson Observation of Grade 8 Mathematics Classes in School B

An abridged version of notes, written up after the visit to School B to observe a Grade 8 Mathematics class, is provided below:

> This lesson in Mathematics was conducted in the large common area with approximately 60 students forming 10 tables of approximately six students at each table. One young, recently graduated teacher delivered the lesson on algebra with two more experienced teachers acting in support by explaining the work and assisting students with application of the content to selected examples on a sheet that had been distributed at the beginning of the lesson. For most of the instructional stage of the lesson, students were generally attentive and followed the content of the lesson. Following the instructional stage of the lesson, which lasted approximately 15 minutes, the instructional teacher asked students to attempt examples on the sheet for the following 15 minutes. She did not join the other support teachers in monitoring the students' individual work as she was reviewing the lesson delivery and planning the next stage of the lesson.
>
> After five minutes of working on set tasks, student concentration began to wane, with a number of students talking among themselves and failing to attend to the requested tasks, despite exhortations from the support teachers. Two tables of students in particular became the focus of the support teachers, who needed extra assistance in applying the principles that had formed the instructional stage of the lesson to the set tasks. Students seated at two other tables had their hands up waiting for assistance, and became more frustrated with their inability to attract the attention of the support teachers. One table of students waited 11 minutes for a support teacher to be freed up to lend assistance to their particular problems.

During their protracted wait, one girl and one boy were provoking each other by drawing on each other's sheet, which had the effect of attracting the attention of other students at the table. Off-task behaviour was apparent in other groups, even those which had received assistance earlier on in that section of the lesson. Towards the end of the 15 minutes of work time, the dynamic of a number of groups was quite unsettled, with students either talking among themselves or engaging in off-task behaviours.

The instructional teacher reconvened the formal lesson after the 15-minute interregnum in order to explain a further mathematical concept. It took some time for full attention to be gained, with the support teachers being required to exert a presence near groups of students who had been unsettled during the second stage of the lesson. One student in a group close to the front was taunting another member of the group with a 20-cent piece but, as it was out of the sight-line of the instructional and support teachers, it continued for some time. The instructional teacher used a question-and-answer technique to elucidate a mathematical concept that would form the next phase of the lesson. During the dialogue and exchange with some members of the class, some students were the object of rebuke from the instructional teacher because they were disengaged, making noise and drawing the attention of other students away from the focus of the lesson. In general terms, a couple of students from each group were engaged in the question-and-answer section of the lesson. However, there were too many hands up and too many students wishing to provide answers for the instructional teacher to involve each student who wished to participate. One girl, who became disenchanted at not being asked to answer the question, muttered an expletive and then proceeded to talk to another student nearby. When challenged by the instructional teacher, the girl was defiant and removed from the class. She was quite resentful about the whole affair and, despite attempts to mollify her by one of the support teachers, the girl was angry and uncooperative. When the observer spoke to the girl after the lesson, she said- *I had my hand up for a long time and she didn't let me answer the question. It is often like that.*

As the second instructional stage of the lesson continues, greater levels of distraction appear throughout the class. The instructional teacher asked for attention frequently, while the support teachers were more active in movement around the groups exhorting students to concentrate and become engaged in the work. Ambient noise around the room increased and something of a struggle between teachers and students ensued. At the end of the third stage of the lesson, the instructional teacher left the classroom to find some support materials and the level of distraction in the groups increased palpably.

The fourth stage of the lesson involved students working individually on further problems that had been the object of a second instructional stage of the lesson. The classroom environment during this stage of the lesson was quite convivial but off-task, with a number of students in each group not bothering to respond to the set work. The two support teachers did not have an opportunity to cover each group, so students were not sanctioned for failing to attend to the work. During the fourth stage of the lesson, two other students — a boy and a girl — were removed for throwing a ruler across the table at each other. The fourth stage of the lesson seemed to provide difficulty for a number of students who had not understood the earlier section of the work and who were either unable or unwilling to have their queries answered. It was also apparent that a number of students had completed the set work and were not inclined to continue with further work, despite support teachers issuing extension work for students who had finished.

Discussion with the Coordinator after the lesson revealed a strong sense of association with the work of the teachers and the ostensible accomplishments of the middle schooling structure at School B. The observer had reservations about the efficacy of the lesson, particularly the amount of off-task time manifested by a number of the students, together with a prevailing undercurrent of cursory involvement through such a large number of students being concurrently taught. Concerns also existed about the lack of opportunity for a large number of students with individual problems to get

adequate assistance, as well as the way in which some particular groups and students 'monoploised' the attention of the support teachers.

6.4.4 Pedagogical Issues in School B

A defined set of educational practices underpins the operation of the integrated unit in School B. A team teaching approach is adopted in the core subjects in Grade 8, which brings two or four classes together for collective instruction at predetermined times of the day and the week. Because teachers involved in the unit have subject specialisms so they rotate the role of instructional teacher and support teacher as outlined in Section 6.2.3. A consolidated approach to this method is accepted and practised by all those who comprise the integrated unit at Grade 8 in School B

Group work is a high priority at both Grade 7 and Grade 8 at this school. In the pre-transition visit, students were working on a project involving autobiographies and much exploratory learning was encouraged with the teacher facilitating learning rather than teaching. Grade 6/7 classrooms were 'open' with students freely moving between rooms at different stages of the lesson. At one point, only six students remained in the Grade 6/7 classroom of the original 28 students. Lessons observed in Grade 8 confirm this teaching methodology, with students being encouraged in all subjects to work in groups cooperatively with one another.

Behaviour management carries with it prevailing ideologies of teaching and these are explicitly connected to perceptions of classroom environment. A highly-defined behaviour management plan exists in School B in order to deal best with the contextual problems of many of the students. Observations in Grade 7 and Grade 8 classrooms indicated that students who transgress behavioural norms and classroom expectations are removed from the environment and held accountable for their behaviour. While

this was evident in School B, there wasn't the same level of student response to consequences as was observed in School A (see Section 6.2.2).

6.4.5 Assessment of Quantitative and Qualitative Data in School B

School B offers a decidedly innovative program to deal with students in the middle years of schooling, particularly those making the transition from Grade 7 to Grade 8. The integrated unit is designed to form a community of students and teachers who mutually explore cooperative learning in group work settings across Grade 6 to Grade 9. The program and the distinctive socioeconomic context of the school help to explain why student perceptions of classroom environments deteriorated considerably (see Figure 6.3). It is worth noting, however, that School B, along with School C (see Section 6.5), has some of the highest mean scores for classroom environment scales in Grade 7 classrooms, but there is a major negative shift in perceptions as a result of the transition. Figure 6.3 highlights the magnitude of the changes during transition, with the most noticeable deterioration occurring for perceptions of Affiliation and Teacher Support.

Observation of classroom environments in the integrated unit at Grade 8 offers some explanation for the extent of change across transition in School B. Collective instruction in large groups diminishes the relationship between the individual teacher and the student. While there is a concerted effort made by the instructional teacher and support teachers to personalise the environment by using names, and a genuine attempt to develop individual accountability between teacher and student to deal with individual problems as they arise, effective outcomes are rendered difficult by the large numbers of students involved in the group-instruction process. The level of support that teachers give students is made tenuous and atrophied by the scale of the activities being undertaken. The large disparity between differential perceptions of Teacher

Support in Grade 7 and Grade 8, shown in Figure 6.1, can be explained by classroom observation of Mathematics classes.

The other major alteration to perceptions of classroom environment between Grade 7 and Grade 8 in School B is for the scale of Affiliation, for which perceptions diminished markedly across transition. This is likely to be a result of a two-fold change consequent upon transition — the increased number of students who join the unit (student numbers increase from 60 in Grade 7 to 120 in Grade 8) and the way in which classes are organised and taught under the aegis of the integrated unit. The sense of classroom belonging, which appeared more evident in Grade 7 in School B, becomes attenuated as a result of the alternation between the large group for instructional learning and the smaller class-based group. Under such circumstances, the sense of belonging or identity pertinent to the individual perception of the group altered dramatically.

All other scales of the MSCEI show diminished student perceptions of classroom environment as a result of the transition to Grade 8, as indicated by the differential changes displayed in Figure 6.1 and the profile of item mean scores in Figure 6.3. Relatively favourable perceptions of the classroom environment at Grade 6/7 were indicated prior to transition to secondary school, but altered sharply as a result of the methodologies that condition different classroom environments in Grade 8. Despite the best of intentions and great commitment from the educators and administrators involved in School B, the transition to Grade 8 generally produced negative perceptions in the eyes of the students.

6.5 School C

Average item mean scores on the actual form of the MSCEI for students in School C were less favourable for a number of classroom environment scales after transition to

Grade 8 (see Figure 6.1). Visits to the school involving classroom observation of lessons and discussions with teachers and administrators revealed that quite different educational frameworks are employed in Grade 7 and Grade 8, respectively, which are likely to account for variation in student perceptions of classroom environment across transition. Students in School C had the highest item mean scores for perceptions of actual classroom environment scales for the six schools involved in this study. Despite decreases in scores across transition, student in School C still perceived MSCEI classroom environment scales were perceived relatively favourably after transition to Grade 8.

Figure 6.5 displays the average item mean for each MSCEI scale for Grade 7, Grade 8 English and Grade 8 Mathematics for School C. This figure illustrates diminished perceptions of classroom environment in Grade 8 for the scales of Autonomy, Student Cohesiveness, Teacher Support, Task Orientation and Involvement. Perceptions of Ease in Grade 8 English have increased but diminished in Grade 8 Mathematics, while the response to the Affiliation scales has become more positive in Grade 8 Mathematics but less positive in Grade 8 English.

Despite the differential perceptions between Grade 7 and Grade 8 learning environment displayed in Figure 6.1, the overall difference can be explained by extremely high scores for each environment scale at Grade 7 coupled with a less positive, but not dramatically so, perceptions of Grade 8 classrooms. This will be discussed in greater detail in Section 6.5.4.

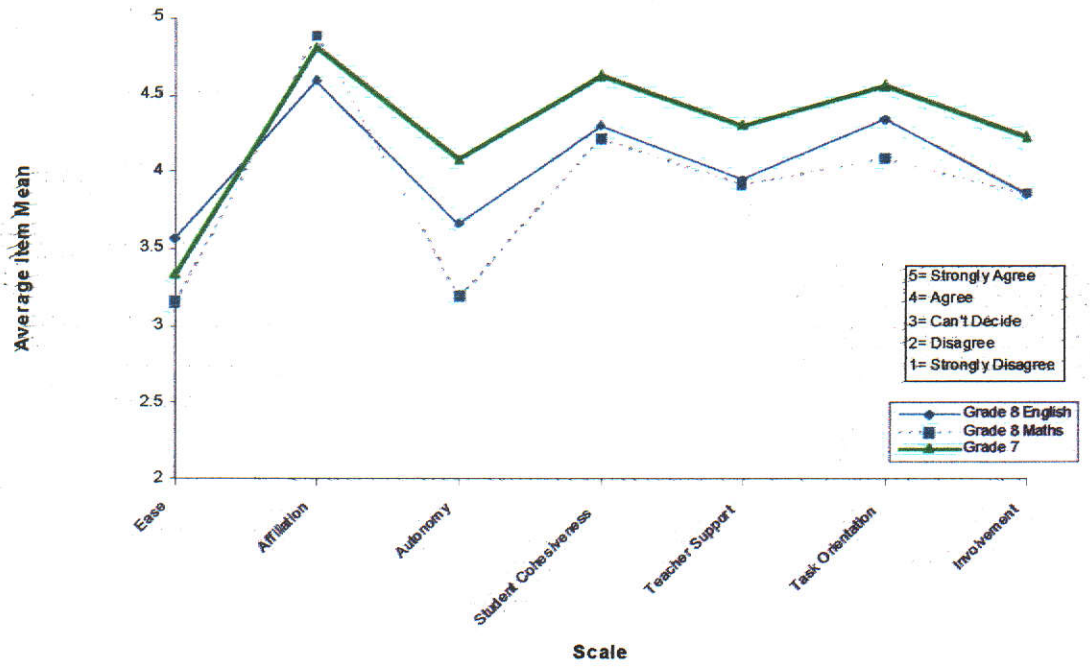

Figure 6.5 Mean Student Perceptions of Actual Classroom Environment in Grade 7, Grade 8 English and Grade 8 Mathematics in School C

6.5.1 Context of School C

School C is a large Catholic girls' school in a relatively prosperous section of the city. Being one of the higher fee-paying schools of its type, the parent and student clientele are generally from reasonably comfortable financial circumstances, with parents having high aspirations for their children who attend the school. Parent participation in the wider life of the school is extensive, with considerable involvement in sporting teams and active support for social and para-educational functions, as well as strategic involvement with governance through the School Board. Most of the prevailing contextual problems that are so visible and apparent in School B are absent from School C.

School C is a Reception-to-Grade 12 school, although it recently added the Reception-to-Grade 2 component. The school is divided into two distinct sections — primary, which formally begins at Reception and ends at Grade 7, and secondary, which begins at Grade 8 and concludes at Grade 12. While both sections of the school are adjacent to each other and separated by a road, there is little by way of interaction and integration between the two entities. For example, when observing a cross-age tutoring activity in the primary school prior to transition, Grade 7 girls were teamed with Grade 3 girls, rather than students from the secondary school who are often included in such programs. Visits to School C indicated that the educational divisions between the school provided for quite self-contained operations, with the primary and secondary sections keeping much to themselves. Further evidence of this separation was observed in the school administration, with the key administrator of the primary school possessing much autonomy to manage the primary section of the school almost independently from the secondary school.

Unlike School A and School B, School C offers a more traditional delineation between the different segments of the school, with girls 'graduating' from Grade 7 and the primary years prior to entering secondary school in Grade 8.

6.5.2 Structural Arrangements in Grade 7 and Grade 8 of School C

The structure devised to manage students in Grade 7 in School C is rather unique among the sample schools from which data were collected. Three classes (two Grade 7 and one Grade 6/7) occupy a large house at one end of the property of the primary school. There are three large teaching spaces for the classes which inhabit the building, as well as sundry preparation areas and offices. Students in Grade 7 are regarded as something of a special entity in School C for they are seniors of the primary sections, are accorded greater freedoms and responsibilities, and have their own geographical location and identity.

Three class teachers work in a cooperative teaching arrangement with the three classes of girls. They meet weekly to plan units of work, coordinate and sequence lesson delivery and collaboratively monitor the delivery and evaluation of classroom teaching. In contrast to School B, however, School C has no combined classes for collective instruction, as each of the three teachers has his/her own subject specialism for which he/she is responsible for delivering to each of the three classes of students. One teacher specialises in Mathematics and Science, another in English and yet another in Society and Environment. The remainder of the curriculum is taught by the class teacher who is identified more closely with each class group for pastoral care purposes, or by specialist teachers in subjects such as Physical Education, Art and Languages Other Than English (LOTE). While subject delineation is tied to a small group of teachers, much flexibility exists with regard to lesson blocks and time, which are not quantitatively apportioned across the week. Eighty five percent of the teaching time is spent with students in the same classroom. This team teaching approach, separated by specialist subject domains, is the structure which is used to educate the girls in Grade 7 in a building quite separate from the rest of the primary school.

The educational structure in Grade 8 in School C is in some contrast to the Grade 7 experience. Girls are divided into Home Groups, with articulated pastoral care arrangements that relate to a Home Group teacher. Multiple specialist teachers are responsible for lesson delivery in a timetable regimen of seven 45-minute lessons, with three lessons before recess, two lessons before lunch and two lessons in the afternoon. Heterogeneous ability classes are formed and maintained for most subjects, although Mathematics and English are 'set' into ability groupings. Students in Grade 8 do not reside predominantly in one room as they move to classrooms that are teacher-based, often in specialist facilities such as science and technology laboratories, or art and drama studios. Therefore, students in Grade 8 move every lesson to different classrooms or teaching facilities, which is in sharp contrast to the Grade 7 experience. School C employs an integrated timetable across the secondary grades, which is particularly effective for managing senior secondary students and classes, but implicitly

draws all students in the secondary school into the same lesson block arrangements and teaching structures.

A Coordinator has overarching responsibility for the welfare and academic progress of the students, and for managing the transition and induction of the students into Grade 8. This is a lateral level of management rather than sequential structure as seen in School A and School B. Horizontal management of students is the structure used throughout the secondary in School C, with Grade Level Coordinators working with a team of Home Group Teachers to provide pastoral care to the students and to monitor their progress. This pattern is replicated throughout the school.

While there are high expectations of the girls in School C and genuine concern for their welfare by the Grade 8 Coordinator and teachers, there does not appear to be consistent links between the curriculum and pastoral care arms of the school. While they seem to operate by instinct and not without effectiveness, the formal interplay between the two is limited. That classroom teaching operates effectively and that students are generally happy with (if not tangibly proud of) their schooling environment is visible. However the structures that provide the connection between curriculum and pastoral care that was so apparent in School A and School B were not evident in School C.

Upon completion of Grade 7, students transfer from the team teaching arrangements of the upper primary school and move across the road to the secondary campus, where they are exposed to many of the formal teaching arrangements that characterise secondary schooling, particularly middle and upper secondary schooling.

6.5.3 Pedagogical Issues in School C

Teaching emphases in Grade 7 and Grade 8 vary considerably. Classroom observation at both stages revealed that Grade 7 teachers use a demonstrably student-centred

approach, engaging in much classroom negotiation of content and process. In a Grade 7 English class, for example, the teacher worked laboriously with students on the challenging issue of 'constructive controversy'. Because of the inherent difficulty of the concept, the teacher negotiated at length the process used to come up with a final product that would attest to student understanding of, and response to, this complex issue. Lengthy discussion with animated and engaging dialogue involving the whole class saw the teacher achieve classroom consensus concerning the kinds of activities that would be undertaken and the assessment task that would measure student learning from the study. This was a very instructive process for the observer.

Group work and cooperative learning modalities were employed by the teacher with discerning efficacy in the Grade 7 classrooms observed. Part of the negotiation phase in the 'constructive controversy' issue was to establish group sizes which, given the nature of the task which required critical thinking and analysis skills, would allow active and meaningful contributions from each student in the class. It was mutually agreed that the optimum number for each group should be small enough for each student to make an effective and accountable contribution, but would also allow for some collaboration along the way. As a result, groups of two became the accepted number. Both students and teacher agreed that the best way to proceed with the unit was via cooperative learning, but in a way that would maximise the input and accountability of each student and would generate the most productive learning outcomes.

It was apparent from observations at other lessons that Grade 7 teachers have a predilection for cooperative learning, highly structured group work, and negotiation and consensus building. This was confirmed through discussion with the teachers, who felt uncomfortable about proceeding with tasks without engaging the students in the process. For the students' part, they responded to this with extraordinary maturity and responsibility.

Implicit to the Grade 7 framework in School C was a decision by the teachers to divide curriculum delivery in a way that would capitalise on the expertise and interests of the teachers, so that certain subjects would be taught across the three Grade 7 classes. The rationale for this structure lay in the belief that students would be better served by limited exposure to specialist teachers in Grade 7 before being subjected to the more rigorous demands of the discrete fields of learning in Grade 8. This was believed to have the two-fold effect of utilising teacher expertise in Grade 7 and developing a more symmetrical subject delivery arrangement than those encountered in Grade 8.

An orthodox set of classroom activities and teaching arrangements were observed in Grade 8 in School C, involving a reasonable level of teacher-centredness and without the level of interchange or negotiation characteristic of Grade 7. The tone of classroom environments in Grade 8 were quite different from Grade 7, with less emphasis on the colour and presentation of the physical environment and a more clinical emphasis on the mechanics of teaching and learning. Notes recorded in a Grade 8 English and Grade 8 Mathematics class indicated that they 'are highly purposeful classes with a strong work ethic being generated by the teacher and responded to by the students'.

Because of the eight designated fields of subject-specialist learning adopted by School C in Grade 8, collaboration for curriculum delivery by subject teachers was not common. Grade 8 teachers generally operated within a subject specific or departmental approach to classroom teaching and management, therefore embracing different philosophical emphases than those presented in Grade 7 classrooms. For example, classes in English in Grade 8 were observed to contain more negotiation and student-centred activities, whereas Mathematics was more instructional and teacher-centred. Subtle variations to student perceptions of the environments can be seen on Figure 6.5, which generally shows sizeable differences between Grade 7 classrooms and Grade 8 English classrooms for the scales of Autonomy, Student Cohesiveness, Teacher Support, Involvement and Task Orientation. Student perceptions and classroom observations attest to greater variance in pedagogy in Grade 8, largely attributable to

the discrete subject methodologies employed by subject specialist teachers in the absence of inter-subject pedagogical emphases.

6.5.4 Qualitative and Quantitative Data Analysis in School C

The transition experience for students in School C was deleterious in terms of changes in perceptions of actual classroom environments. Most noticeably, students' perceptions of Autonomy, Student Cohesiveness, Teacher Support, Task Orientation and Involvement diminished and did so sizably during the transfer to the secondary environment (see Figure 6.5). This can be explained through the different educational frameworks that are provided to the students in Grade 7 and Grade 8, respectively, as well as differential classroom experiences that transpire as a result of altered teaching emphases in Grade 8.

Grade 7 in School C is a closely-knit community of students and teachers. There is a sense of seniority endowed upon the girls by their teachers in the final year of primary schooling, in recognition of the fact that Grade 7 students have reached the apex of the school. The discrete, self-contained location further isolates and ennobles the Grade 7 enclave providing the students with the opportunity to establish a homogenous unit inside of the school. It was clear through observation and confirmed through data analysis that students hold a deep attachment to the Grade 7 setting and teachers, and that they possess very favourable perceptions of their classroom environments. In fact, scores for the scales of Affiliation, Autonomy, Student Cohesiveness, Task Orientation and Involvement are the highest of the six schools involved in the research. The students were treated as mature seniors of the school, despite being only 12 and 13 years of age. There was a tangible sense of common purpose and rich student-teacher relations in the Grade 7 classrooms visited. Just one example of the type of dialogue that transpired in the 'constructive controversy' unit was the tone used by the teacher who wished to alter a previously negotiated time schedule for the lesson: *I'm sorry to*

interrupt girls, but are you ready to move into Section 2? The teacher was aware that an intrusion was being made into the student group work which, from the observer's perspective, was on-task and intense. The interruption from the teacher, however, showed a deliberate attempt to dignify the students and seek direction about the next section of the lesson. This type of sentiment was indicative of the teacher's willingness to respect the students and their involvement in set tasks, which had the reciprocal effect of encouraging the students to be responsive to the request and to please the teacher. This highly relational and respectful environment was no doubt responsible for such favourable perceptions of Teacher Support and the sense of Affiliation that the students possess as a result of their membership of the group.

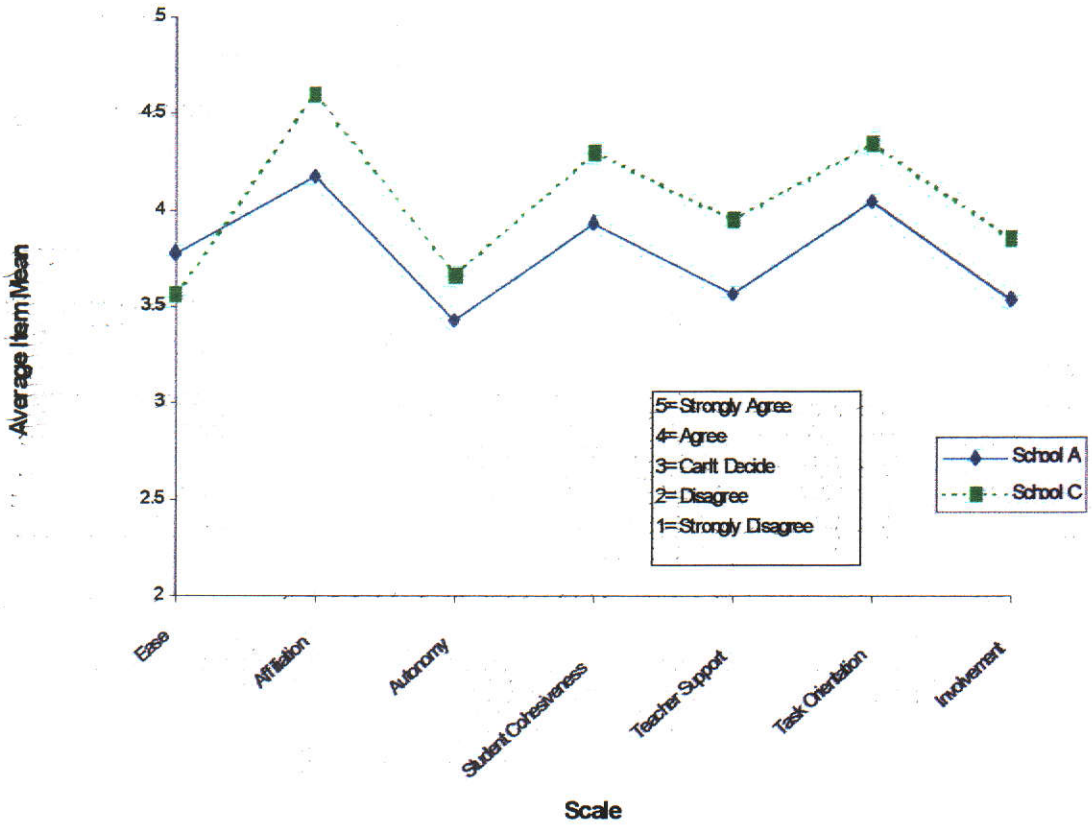

Figure 6.6 Comparison of Mean Scores for Actual Classroom Environment Scales in English for Two Schools After Transition to Secondary School

Because three teachers in School C work in a defined structure in Grade 7, the chance to personalise learning and attend to the individual needs of students as they arose was maximised. The Grade 8 classroom environments were more consistent with other schools in the sample. While the overall impact of transition on the perceptions of classroom environments was marked in School C, a large measure of the effect is related to the extremely favourable perceptions of Grade 7 classrooms, rather than to negative perceptions of Grade 8 classrooms per se. For example, for the scales of Teacher Support, Task Orientation, Student Cooperation and Affiliation, School C still has the highest mean scores when compared to the experience of students in other schools in the sample. This confirms that classroom environments are still perceived very positively in Grade 8, yet perceptions were adversely affected by the transition when compared to the Grade 7 profile. This provides interesting and illuminating information that contextualises the transition experience of the students in School C against the larger sample of other students and schools involved. Figure 6.6 demonstrates the relative difference between actual scores in Grade 8 English classes for classroom environment scales of School A and School C after transition. Students in School C clearly have higher average item mean scores than School A for each MSCEI scale in Grade 8, with the single exception of Ease. While the transition to secondary school in School A was relatively favourable for students in School A (see Figure 6.1) and the transition experience provided disjuncture for students in School C (see Figure 6.5), this comparison provides interesting information about the relative difference in classroom environment perceptions in the respective schools in English in Grade 8.

Despite sizeable changes in classroom environment perceptions in School C across transition to Grade 8, students still hold positive perceptions of their classroom when compared to other schools in the sample. The sense of mutual respect between teachers and students, the nature of investigative tasks presented in class, and the warmth of relations between students are visibly apparent in Grade 8, although not to the same

extent that existed in Grade 7 classrooms prior to transition. Discussion with one student who was a well-integrated member of the class and involved in the English lesson that was being observed made an insightful and revealing comment: *School is much more serious now*. High lesson turnover and multiple specialist teachers in a setting where students move en masse every 45 minutes provide a sharp contrast to the stable and highly relational environment that was characteristic of the Grade 7 classroom experience. It is not surprising that perceptions of the classroom environment alter, and alter markedly as a result. As the data collection during the pre-transition phase was undertaken near the end of the year, there was a sense of grief among the girls in Grade 7 that their class was being broken up and relationships which had been established would either come to an end or alter during the transition to Grade 8. This finding is not dissimilar to Ferguson (1998) and Ferguson and Fraser's study (1996, 1998) of students in transition, which detected some gender-specific implications of students in transition between primary school and secondary school.

6.6 School D

School D had one of the most positive transition experiences among the six schools in the research sample (see Figure 6.1). Relative to Grade 7, students reported more favourable perceptions of classroom environment for the scales of Affiliation, Autonomy, Teacher Support, Task Orientation and Involvement in Grade 8 English classes, and more favourable perceptions of Teacher Support, Task Orientation and Involvement for Grade 8 Mathematics classes. In general, English classes had higher average item mean scores after transition than Mathematics classes, indicating that students in School D have more favourable impressions of English classrooms than Mathematics classrooms in Grade 8. For the scale of Ease, students perceived greater levels of Ease in Grade 8 English classes and less Ease in Mathematics classes when compared to Grade 7. This is illustrated in Figure 6.8 and is discussed in detail in Section 6.5.2. Because School D provides coherent curriculum experiences through

constructivist learning environments via the Primary Years Program (PYP) and the Middle Years Program (MYP) across transition, and because there is a strong emphasis on developing student- teacher relationships through pastoral care programs, it is not surprising that favourable perceptions of Grade 8 classroom environment exist (see Figure 6.6).

6.6.1 Context of School D

School D is a co-educational school with an enrolment extending from Reception to Grade 12. Geographically located in one of the prosperous socioeconomic regions of Adelaide, School D attracts students whose parents have high expectations for their children's education and are willingly involved in the many aspects of school life, including sport, parent social gatherings, parent committees, and so on. The physical setting of the school is striking, lodged among some of the most prestigious homes in Adelaide, boasting expansive grounds and gardens, as well as high-quality facilities and bountiful resources. A healthy and successful alumni of old scholars add tradition and pride to the school, which perennially secures high academic achievement in external examinations in the senior secondary schooling. A culture of achievement is alive and well at School D.

When this research was being conducted, two distinctive aspects of the school pertinent to this study were observed. The first is the geographical and administrative separation of the primary and secondary schools on the same site, with discrete teaching areas, recreation facilities and classrooms that are more traditionally characteristic of primary and secondary schooling, respectively. In Grade 7, for example, teachers tended to be based in classrooms with a group of students for which they were responsible, although some team teaching was practised across the two Grade 7 classrooms. Grade 8 classes were exposed to multiple teachers, but similar lesson structures of 7 x 45 minutes were replicated across Grade 7 and Grade 8 classrooms. Grade 7 classes adhered quite

closely to the lesson turnover schedule to condition students to frequent changes that would be encountered in the following year. In addition, a number of specialist teachers were responsible for the delivery of a range of specialist subjects in Grade 7, including French, Music, Computing, Physical Education and Choir. While elements of specialist teaching and lesson turnover were similar in Grade 7 and Grade 8 in School D, there is little formal interplay between teachers and students in the two grade levels. This is not to suggest that major preparations for the transition to secondary school are not undertaken in the latter stages of Grade 7 — visitation to the Grade 8 area, induction meetings with teachers and formal gatherings with the Coordinator were measures conducted by administrators and teachers to ensure that the transition to secondary school would be smooth and satisfactory for the students concerned. Despite these preparatory steps, there was little daily and ongoing interaction between the primary and secondary domains of School D.

The other prevailing contextual feature of School D pertinent to this study is the school-wide adoption of the International Baccalaureate Program (IB), which explicitly embraces the concept of constructivist learning environments in the compulsory years of schooling (i.e. Reception to Grade 10). An articulated matrix of curriculum experiences is devised and delivered to students as they move sequentially between the Primary Years Program (PYP) and the Middle Years Program (MYP), with consolidated curriculum emphases that provide inquiry-centred learning in the context of the social construction of knowledge. This is treated in detail in Section 6.5.3, which discusses major pedagogical principles and frameworks adopted in School D.

6.6.2 Structural Response to Middle Schooling

The management of students in Grade 7 and Grade 8, respectively, in School D is not considerably different from the framework in School C. Orthodox primary school teaching methodologies and student management techniques are clearly evident in

Grade 7 classrooms, with a class teacher substantially responsible for the delivery of core subjects at the classroom level. There is a degree of team teaching employed between the two Grade 7 teachers, although without the same importance or geographical distinctiveness characteristic of the setting and students in School C. In a sense, Grade 7 in School D is regarded as the senior year of primary school, but intimately connected to all other aspects of primary school life in School D.

The management of students in Grade 8 in School D is the responsibility of a Coordinator who works with a team of five other teachers who teach a number of classes in Grade 8, and are responsible for the pastoral care of the students. There is a deep concern for student welfare in School D, and teachers seconded to work at the lower secondary level possess an awareness of the needs of adolescents and work assiduously to ensure that these needs are met. This information was elicited from discussions with the Coordinator and classroom teachers, as well as observation of lessons in Grade 8. In addition, there is a concerted effort made to include the large numbers of students who join the school in Grade 8, most of whom come from smaller feeder schools in the region.

Some of the structural measures that have been used for some time in School D to prepare students for the nature of secondary schooling in Grade 8 include the use of defined and delineated timetable blocks of 7 x 45 minute lessons, and a larger number of specialist teachers in Grade 7. Administrators in School D believe that the early introduction to lesson turnover schedules consistent with secondary school and a larger number of specialist teachers, in subjects such as French, Physical Education, Computing and Music in Grade 7, are beneficial as they prepare students for some of the key aspects of the Grade 8 regime, prior to the transition to secondary school. Because the rest of the secondary school embraces an integrated timetable in School D, administrators believe that the best way to prepare students in Grade 8 for it is to adopt measured elements of it in the year prior to Grade 8.

6.6.3 Pedagogical Emphases in School D

Most striking about School D in the compulsory years of schooling (Reception to Grade 10) is the commitment to constructivist learning through the PYP and MYP curriculum framework, which is managed through the International Baccalaureate. School D is the only school in South Australia with a Reception-to-Grade 12 enrolment that provides the coordinated curriculum emphases of the IB throughout the school. It is authorised to do so, thus providing a curriculum, in design and delivery, which is congruent with the PYP and MYP, respectively, and subject to frequent and rigorous authorisation visits by the Australasian office of the IB.

One of the most influential curriculum initiatives over the last decade has been the further understanding of constructivism, as a way by which learners construct and interpret knowledge (Ackerman, 1995; Aldridge, Fraser, Taylor & Chen, 2000; Brooks & Brooks, 1993; Bruckman & Resnick, 1995; DeVries & Kohlberb, 1990; Fosnot, 1996; Kim, Fisher & Fraser, 1999; Knuth & Cunningha, 1993; Simons, 1992; Steffe & Gale, 1995; Taylor, Fraser & Fisher, 1997). While the general implications of constructivist learning have been the object of much scholarship, an emerging field of interest has also investigated constructivist learning principles in mathematics (Schifter, 1996; Wheatley, 1991; Wood, Cobb & Yackel, 1995), science (Duit, 1995; Shapiro, 1994; Wheatley, 1991), computing and technology (Becker, 1992; Boethel & Dimock, 1999; Perkins, 1992) and reading (Stanovick, 1994). Constructivist learning theory essentially embraces the core principles of:

- learning being situated in the context where it occurs
- knowledge being actively constructed and interpreted by the learner
- the importance of prior understanding and experience to interpret and develop knowledge
- the importance of social interaction in learning.

These principles form the underlying basis of the PYP and MYP programs at School D, utilising student and inquiry-centred learning. The curriculum framework is not prescriptive or formulaic; rather, it requires teachers to embrace emphases for classroom learning that are collaboratively designed and individually delivered in the classroom. Therefore, the curriculum framework at School D, which is tightly monitored, collaboratively developed and incorporates clearly delineated and consistent teaching and learning emphases, is coherently articulated across Grade 7 and Grade 8 as part of a developmental learning matrix. There is much more that could be added to the description of both constructivism and its expression through the IB programs, but the core principles only need be described here.

Whereas the structural and pastoral care arrangements are managed laterally in School D, the curriculum affairs are managed vertically through the MYP Coordinator, who is responsible for articulation of curriculum across Grade 7 to Grade 9. School D is the only school in the research sample which has such a stringent curriculum management structure, and one which devotes considerable attention to sequential learning experiences across the transition years. From the researcher's perspective, it appears that a number of schools, apart from School D, failed to dovetail student learning and curriculum affairs closely between Grade 7 and Grade 8 because of the relatively large intake of students that occurs in the first year of secondary school. Other schools in the research sample spent the early weeks of Grade 8 orienting students into the culture of the school and the site-specific emphases of the secondary regime, a number of which were not congruent with the types of learning experiences provided in Grade 7 in the previous year. School D, however, continued its curriculum framework and teaching emphases, spending time to inculcate new students into the principles of MYP learning. While students in School D involved in the longitudinal study experienced relatively favourable perceptions of classroom environment scales after transition to secondary school, students new to School D in Grade 8 did not report as favourable perceptions of the classroom environment.

Figure 6.7 displays two sets of students' perceptions of actual classroom environment in School D for Grade 8 English; those students who continued from Grade 7 to Grade 8 in School D; and those students who joined the school in Grade 8. It is clear that those students who had been exposed to the curriculum and teaching emphases in Grade 7 in School D have much more favourable perceptions of the classroom environment with higher means scores for every scale on the MSCEI, than those who are new to the school. This is the only instance in this thesis when perceptions of the classroom environment of students outside of the sample of 311 students longitudinally involved in the study are used. Students new to the school demonstrate a consistent difference in the perceptions of classroom environment from other students in the cohort — largely attributable, in the opinion of the researcher, to the distinctive nature of constructivist learning environments.

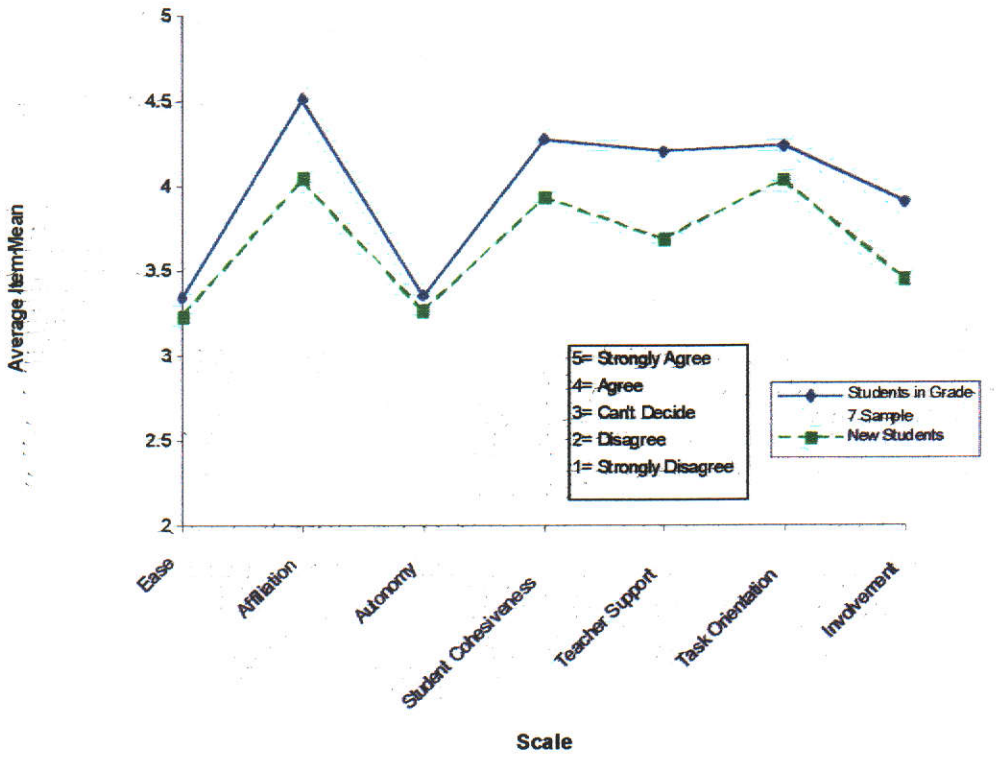

Figure 6.7 Comparison of New and Continuing Students' Perceptions of Actual Classroom Environment for Grade 8 English Classes in School D

The size and nature of change in classroom environment experienced by students in School D across transition was favourable when compared to the perceptions of students in other schools involved in the sample. (see Figure 6.8). Classroom observation of lessons detected the inquiry-centred method of learning, along with other principles of constructivism involving contextual learning and social integration of knowledge. The emphases of the PYP and MYP in Grade 7 and Grade 8, respectively, were clearly evident to the researcher, particularly in classes of English and Society and Environment, where the principles of inquiry learning and the importance of transdisciplinary learning were apparent.

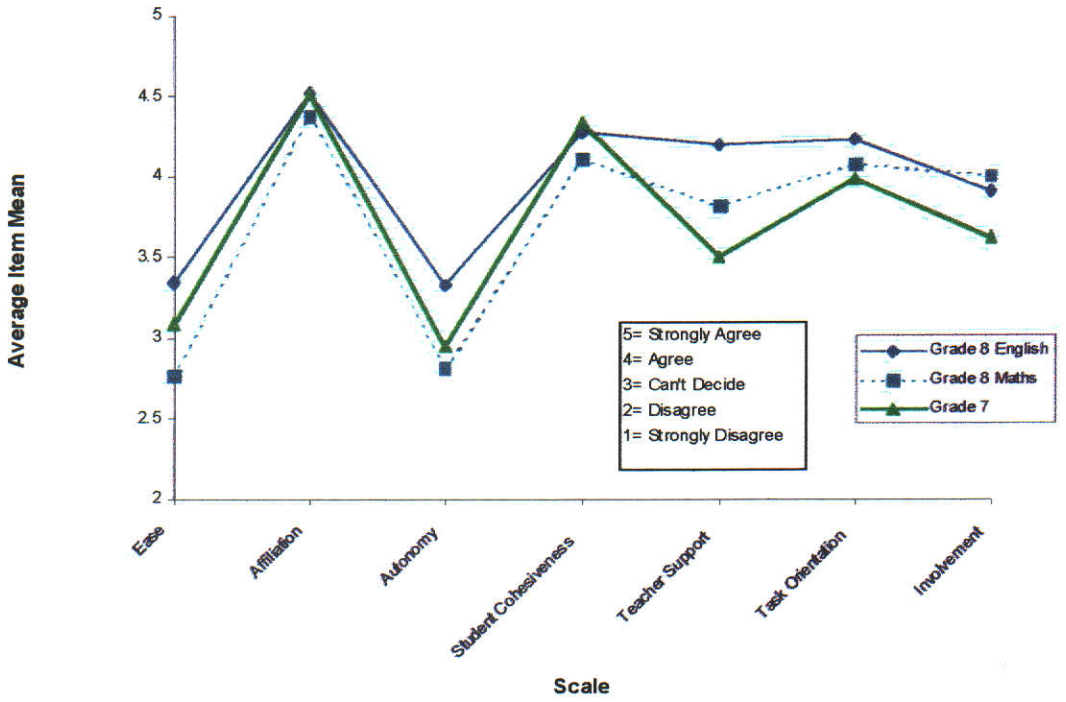

Figure 6.8 Average Student Perceptions of Actual Classroom Environment in Grade 7, Grade 8 Mathematics and Grade 8 English Classes in School D

Figure 6.8 displays school profiles of student perceptions of actual classroom environment scales in School D for Grade 7, Grade 8 English and Grade 8

Mathematics. This figure shows relatively more favourable perceptions of the scales of Teacher Support, Task Orientation and Involvement in Grade 8 than what existed in Grade 7. These three scales more squarely relate to the classroom-based learning associated with constructivism, particularly the way in which students are engaged in understanding and responding to activities at the classroom level. In general, student perceptions of Grade 8 Mathematics classes are not as favourable as those for Grade 8 English classes, with higher average item mean scores being registered for the scales of Affiliation, Autonomy, Student Cohesiveness, Teacher Support and Task Orientation for English classes. The only classroom environment scale which has diminished consistently between Grade 7 and Grade 8 in School D is Student Cohesiveness, which can be explained by the larger size of the Grade 8 cohort and setting arrangements in Mathematics and English, which break the composition and identity of classes from those of other subjects.

Despite a greater number of specialist teachers in Grade 8 and more strident expectations associated with secondary schooling in School D, student perceptions of classroom environment are more favourable than in Grade 7, largely attributable to constructivist curriculum emphases associated with the PYP and MYP.

One of the many specific emphases of the IB during the compulsory years is the importance of social interaction and cooperative learning. This was practised extensively in the Grade 7 classrooms that were observed and also applied with similar rigour and frequency in Grade 8. This took the form of highly-structured group work for selected aspects of the curriculum, which provides students with individual accountability for a section of a group activity, the design, management and presentation of which was a point of negotiation and consensus by the group. During a Grade 8 Society and Environment lesson, for example, students were asked to work collaboratively on a mapping exercise. Using the principles of inquiry-based learning, students were required to combine the concepts of latitude, longitude and topographical mapping to produce a group project, which was an island containing designated

geographical features. The important aspect of this work from the observer's point of view was that students had control over their own role within the group, but that each student was individually accountable for their own section of the work. The classroom environment was very positive with students on-task and enjoying their interactions. The teacher held high expectations of student behaviour, creating an orderly but engaging classroom environment that was product-centred.

The transition experience for students in School D was a relatively positive one, with favourable perceptions of a number of MSCEI classroom environment scales in Grade 8. Articulated curriculum emphases established largely through the PYP and MYP programs, the consistent application of cooperative learning across Grade 7 and Grade 8, and a strident concern for the pastoral welfare of students appear largely responsible for the relatively positive perceptions of Grade 8 classroom environments.

6.7 Conclusion

Qualitative data gathered from sample schools involved in the research explain a number of results from the quantitative data extracted through the administration of the and analysis of the MSCEI. Site-specific measures adopted in each school have influenced student perceptions of their classrooms to form distinctive profiles of classroom environments that can be assessed more thoroughly by combining qualitative and quantitative data.

In each of the schools involved in the research, sizeable differences were found between classroom environments in Grade 7 and Grade 8. Aggregated quantitative data generally revealed that students experience a deterioration in classroom environments during the transition to Grade 8. However, the transition experience varied between schools, and changes to environment dimensions during transition were associated with the internal management of transition and were affected by pedagogical

emphases and the school context. This chapter addressed the sixth of the research questions by attempting to draw links between student perceptions of classroom environment and variations in site-specific characteristics of the classroom and the school in Grade 7 and Grade 8.

While School A and School B have embraced structural frameworks and pedagogical emphases consistent with contemporary views of middle schooling (see Section 2.7), the net impact has been felt vicariously by students and largely influenced by the context of the respective schools. Both Schools A and B deploy cooperative teaching and learning methodologies, although the more highly structured classroom environments in School A are consistent with more favourable perceptions of classroom environment in Grade 8, despite a similar profile of perceptions prior to the transition to secondary school. The collective instruction modality used in School B appeared to lead to a lack of individual attention and accountability for the students in School B, which produced less favourable perceptions of a number of classroom environment dimensions (including Affiliation, Autonomy, Involvement, Student Cohesiveness, Teacher Support and Task Orientation) in School B relative to School A.

School C, which had the highest mean scores and the most favourable actual classroom environment in Grade 7 for all schools in the sample, utilised a self-contained, cooperative teaching structure in Grade 7. A highly relational environment was established, with a high level of trust and cohesion being evident at the classroom level, producing very positive perceptions of all environment dimensions in the three classes involved in the sample from School C. Students from each of the three classes were highly satisfied with the prevailing classroom climate, which was conditioned by a core of three specialist teachers who were collectively responsible for the delivery of the curriculum. When compared to other schools in the sample, relatively favourable perceptions of actual classroom environment scales existed in Grade 8 in School C. However, there still were sizeable changes in perceptions of actual classroom environment between Grade 7 and Grade 8. This is partly attributable to the very high

values in Grade 7, as much as to integrated timetabling arrangements, multiple and discrete subject teaching provision and rapid lesson turnover in the secondary school.

School D has a unique curriculum articulation through constructivist learning approaches in Grade 7 and Grade 8. Students in School D reported more favourable perceptions of Grade 8 classroom environment dimensions, relative to Grade 7, for six of the seven scales on the MSCEI. This suggests that congruence of curriculum and teaching emphases is likely to limit the disjuncture between primary and secondary schooling.

Some tentative conclusions can be drawn from these findings:

- Site-specific measures and structures adopted at the school level to manage students in transition can affect the size and nature of classroom environment between Grade 7 and Grade 8.
- Highly relational environments in upper primary school, coupled with a small group of teachers operating as a team, have the potential to create very favourable perceptions of classroom environment in Grade 7.
- Articulated emphases, either in approaches to curriculum design and delivery (vis-à-vis School D) or pastoral care arrangements (vis-à-vis School A) between Grade 7 and Grade 8, can minimise the impact of transition to secondary school and can promote favourable perceptions of classroom environment.
- Clustered teaching arrangements in Grade 7 and Grade 8 are consistent with favourable student perceptions of classroom environment.
- School context has the potential to be a powerful determinant of classroom environment.
- Larger student enrolments in Grade 8, relative to Grade 7, can lead to lower Affiliation in the secondary school environment.
- Multiple specialist teachers and greater frequency of lesson turnover has an adverse effect on student perceptions of classroom environment in Grade 8.

These conclusions, extracted through the administration of the MSCEI and substantiated by qualitative data gathering during school visits, support a number of contemporary findings on middle schooling. The significance of this research is that it utilised a micro-conceptualisation of the classroom as distinct from a macro-conceptualisation of the school as the field of study. Student perceptions of classroom environments in Grade 7 and Grade 8 were gathered and analysed, and combined with extensive qualitative data from classroom observation and discussions with administrators, teachers and students, to draw these tentative conclusions.

CHAPTER 7

Discussion, Conclusions and Implications

7.1 Introduction

This study investigated student perceptions of classroom environments in Grade 7 and Grade 8 in six metropolitan schools in Adelaide. Using a new instrument entitled the Middle School Classroom Environment Indicator, a sample of 311 students were tracked longitudinally to assess, compare, contrast and interpret perceptions of middle school classrooms as students moved between primary and secondary school. The outcomes of this study provide insights into the nature of classroom environments in upper primary and lower secondary schooling, and hold importance for educators and administrators managing students in transition.

This chapter reviews the specific questions proposed in this research to see whether discernable outcomes associated with the investigation have been forthcoming. The research questions are treated in order of their presentation in Chapter 1. These include whether a valid and reliable instrument could be devised to measure perceptions of classroom environments pertinent to middle schooling (Section 7.2), investigation of differences between actual and preferred classroom environments in Grade 7 and Grade 8 (Section 7.3), exploring the effect of transition on student perceptions of classroom environments (Section 7.4), investigation of associations between student Satisfaction and classroom environment scales (Section 7.5), and identification of structural approaches and teaching emphases which are associated with favourable perceptions of classroom environments after transition to secondary school (Section 7.6). In addition, this chapter presents a summary of the main findings

(Section 7.7), makes recommendations for future research in middle school classrooms (Section 7.8), draws attention to limitations of this study (Section 7.9), and concludes with my final remarks about this study (Section 7.10).

7.2 Validity of the Middle School Classroom Environment Indicator (MSCEI)

The initial research question raised a problematic issue:

> **Is it possible to design a valid and appropriate questionnaire to assess students' changing perceptions of classroom environments in the transition from primary to secondary school?**

Despite the rich and extensive tradition of classroom environment research and the profusion of existing instruments, it was believed necessary to devise a new instrument that would be appropriate and relevant for assessing the distinctive nature of classroom environments in upper primary and lower secondary school. To that end, considerable investigation of contemporary literature on middle schooling revealed that disjuncture in transition is often a result of alienation and loss of identity (Cormack, 1996a, 1996b), insufficient opportunity to grow in independence and autonomy (Eyers, Cormack & Barratt, 1993), larger numbers of students in secondary schools (Ferguson and Fraser, 1996, 1998), less meaningful relationships between teachers and students (Barratt, 1998; Hawkins & Bendt, 1985), disinclination (Lounsbury & Clarke, 1990), curriculum 'centredness' and less student participation in class activities (Feldlaufer, Midgley & Eccles, 1988; Rosenholtz & Simpson, 1985), and increased difficulty of the work (Feldlaufer, Midgley & Eccles, 1988). While a number of these aspects of middle schooling have been the object of past research and scholarship, few have been

specifically investigated using the micro-conceptualisation of the classroom, as distinct from the macro-conceptualisation of the school or the psychology of adolescence.

Discussions with a reference group of students in Grade 7 prior to transition suggested that there were important existing dimensions of classroom environments that would ideally be preserved or replicated in Grade 8. Accordingly, the MSCEI was constructed to measure student perceptions of Affiliation, Autonomy, Teacher Support, Student Cohesiveness and Cooperation, Involvement, Task Orientation and Ease, each of which was believed to be an important indicator of classroom environment, given recent research in the field and affirmation from the student reference group. A further scale of Communication was included by the researcher in the light of claims that adolescents are less communicative, or perhaps at the classroom level, given less opportunity for communication and self-expression (Rounds & Osaki, 1882; Ward, Mergendoller & Tukunoff, 1982)

In addition, a dependent variable of satisfaction was included to see if specific dimensions of classroom environment scales were associated with students' satisfaction with their class.

Of the original nine scales on the MSCEI, seven scales survived statistical validity tests, including factor analysis and one-way analyses of variance (ANOVAs) to check the ability of scales to differentiate between classrooms. This left the scales of Affiliation, Autonomy, Teacher Support, Student Cohesiveness, Involvement, Task Orientation and Ease, with the number of items in each scale ranging from four to six. Validity of the remaining items was supported by item analyses using the individual score and the class mean as the unit of analysis.

Cronbach alpha reliability coefficients for different scales ranged from 0.69 to 0.86 when using the individual as the unit of analysis for Grade 7 and from 0.82 to 0.95 when using the class as the unit of analysis. For Grade 8 English and Grade 8

Mathematics, respectively, reliability coefficients ranged from 0.62 to 0.86 and 0.68 to 0.89 using the student as the unit of analysis, and from 0.42 to 0.91 and 0.59 to 0.92 with the class as the unit of analysis. A series of one-way ANOVAs gave statistically significant values for the eta^2 statistics (which is the ratio of 'between' to 'total' sums of squares and represents the variance in scale scores accounted for by class membership) for all three samples – Grade 7, Grade 8 English and Grade 8 Mathematics. Eta^2 ratios ranged from 0.69 to 0.24 for different scales. Significant values for the eta^2 statistic indicates that each scale on the MSCEI was able to differentiate between the perceptions of learning environment held by students in different classes.

Alpha reliabilities for the preferred form are similar to those obtained for the actual form, ranging from 0.74 for the Autonomy scale to 0.88 for the Ease scale, using the student as the unit of analysis. Discriminant validity coefficients ranged from 0.10 to 0.47, indicating that the scales are generally independent although sometimes overlapping.

Factor analyses for the actual and preferred forms of the MSCEI were sound, with few items overlapping with other scales and most items loading onto their original scale. For the three data sets for the actual form (Grade 7, Grade 8 English and Grade 8 Mathematics), there were 16 cases for which an item didn't load at least 0.4 on its own scale, while there were eight cases for which an item didn't load at least 0.4 on another scale besides its own. In total, only 24 problematic results out of 693 factor loadings (7 scales x 33 items x 3 samples), suggests that the actual version of the MSCEI has a sound overall factor structure.

For the preferred form, and for two data sets (Grade 7 and Grade 8), factor loadings were also sound. There were only six instances for which an item didn't load at least 0.4 on its own scale, and seven instances for which an item loaded at least 0.4 on a

scale other than its *a priori* scale. With 13 problematic results out of 482, the preferred version of the MSCEI has a sound factor structure.

The results of the study suggest that the MSCEI scales showed satisfactory internal consistency, discriminant validity and ability to differentiate between classrooms, and that the factor structure is consistent with the *a priori* structure. The results of these analyses suggest that the MSCEI is a valid and reliable instrument for investigating the nature of classroom environments in Grade 7 and Grade 8 classrooms. Statistical validation of the preferred form involving factor analyses revealed similar factorial validity and reliability to those for the actual form.

7.3 Differences Between Actual and Preferred Environments

Past research has made extensive use of actual and preferred perceptions of classroom environment (Fisher & Fraser, 1983b; Fraser & Deer, 1983; Fraser & O'Brien, 1985). Particular research questions were:

> **Do sizeable differences exist between actual and preferred environments in Grade 7 and Grade 8 classrooms?**
>
> **Are differences between actual and preferred classroom environments magnified during the transition to secondary school?**

The findings associated with these two questions are discussed under two headings — namely, differences between actual and preferred environment (Section 7.3.1) and effect of transition on actual and preferred environments (Section 7.3.2).

7.3.1 Differences Between Actual and Preferred Environments in Grade 7 and Grade 8

Actual and preferred versions of the MSCEI were developed to measure the differences between classroom environments that students experienced in Grade 7 and Grade 8, as distinct from those which they ideally preferred. It was found that significant differences, investigated by *t* tests for paired samples, existed between actual and preferred forms of the scales of Affiliation, Involvement, Student Cohesiveness, Task Orientation and Teacher Support in Grade 7 classrooms. Differences between actual and preferred classroom environments also were apparent after transition to Grade 8, with sizeable differences on five of the scales on the MSCEI. Less sizeable differences between actual and preferred environments existed for the scales of Autonomy and Ease. This finding corroborates past research which has established clear differences between milieu participants' perceptions of actual environments and those which they would prefer (Fraser, Giddings & McRobbie, 1995; Fraser & McRobbie, 1995; Thorp, Burden & Fraser, 1994; Yarrow, Millwater, & Fraser, 1997).

7.3.2 Magnification of Difference Between Actual and Preferred Environments Across Transition

The purpose behind using actual and preferred forms in this study was not to see whether intervention or modification to the environment would reduce the gap between actual and preferred classrooms, as has been undertaken in past studies (Fraser & Deer, 1983; Fraser & Fisher, 1983a; Thorp, Burden & Fraser, 1994). The specific intention of devising and utilising both forms was to ascertain whether the degree of difference between perceptions of actual and preferred classroom environment altered when students moved between Grade 7 and Grade 8. Average

item mean scores revealed that, for six of the seven scales of the MSCEI, larger differences existed between actual and preferred classroom environment in both Grade 8 English and Grade 8 Mathematics classes, relative to the differences that existed in Grade 7. The magnitude of difference between actual and preferred environments for the scales of Affiliation, Autonomy, Ease, Student Cohesiveness, Task Orientation and Teacher Support was greater in Grade 8 English than it was for the same scales in Grade 7. The scale of Involvement, which had a lower average item mean score for the actual environment in Grade 8 English, had a smaller discrepancy between actual and preferred scores in Grade 8 English than was the case in Grade 7. The scales of Affiliation and Teacher Support showed larger differences between actual and preferred environments in Grade 8 English when compared to their respective perceptions of Grade 7.

Similarly, relative to Grade 7, Grade 8 Mathematics classes displayed greater disparity between actual and preferred environments on the scales of Affiliation, Autonomy, Student Cohesiveness, Task Orientation and Teacher Support. These differences were even larger than those evident in Grade 8 English classes. The only scale for which difference between actual and preferred environments did not increase across transition was Involvement in Grade 8 Mathematics.

From an analysis of actual and preferred scores, two main outcomes are apparent:

- Sizeable differences exist between student perceptions of actual and preferred environments in Grade 7, Grade 8 English and Grade 8 Mathematics classes.
- The magnitude of the difference between actual and preferred environments is greater in Grade 8 English and Grade 8 Mathematics classes than in Grade 7 for six of the seven scales of the MSCEI.

When a larger magnitude of difference between perceptions of actual and preferred classroom environments at Grade 8 is coupled with diminished perceptions of actual

environments after transition (Section 7.4), the net effect of transition on perceptions of classroom environments has been detrimental. These findings lead on to the third research question in this study.

7.4 Student Perceptions of Classroom Environments After Transition to Grade 8

The focus of this research was to see whether Grade 8 classrooms were perceived differently from Grade 7 classrooms, and whether the perceptions of classroom environment after transition are more or less favourable. One of the research questions specifically sought a response to:

> **Does the transition to secondary school affect (adversely or otherwise) student perceptions of the classroom environment?**

Previous research (Feldlaufer, Midgley & Eccles, 1988; Ferguson & Fraser, 1996, 1998) has reported discontinuities in the transition to secondary school and diminished perceptions of classroom environment in Grade 8. Specific changes that have been established by Feldlaufer, Midgley and Eccles (1988) in Mathematics classes in Grade 8 include:

- Changes in perceptions of teacher support, with teachers in secondary school perceived as being less friendly and caring than their counterparts in primary school.
- Increased difficulty of the work.
- Diminished motivation stemming from increased task requirements and less opportunity for classroom interaction.

Some of these changes were confirmed by Ferguson and Fraser's study, (1996, 1998) particularly students' perceptions of teachers as being less friendly and less responsive to student needs in Grade 8. Ferguson and Fraser's study also reported that students who joined large secondary schools from smaller primary schools experienced problems with adjustment and integration into the classroom environment of the secondary school. By distinguishing between Mathematics and English classes in Grade 8, this study sought to investigate whether students encounter different classroom environments in secondary school, and whether or not these environments are perceived more or less favourably.

7.4.1 Perceptions of Grade 7 and Grade 8 Mathematics Classrooms

Comparison of the average item mean scores for Grade 7 and Grade 8 Mathematics classes demonstrates a clear difference in perceptions of actual classroom environments. For the scales of the MSCEI, students perceived less Affiliation, less Autonomy, less Involvement in class activities, less Task Orientation, less Student Cohesiveness, and less Teacher Support in Grade 8 Mathematics than in Grade 7. Paired t tests demonstrated statistically significant differences ($p<0.01$) in perceptions of classroom environment for each scale, except Ease for Mathematics. Not only do the lower average item mean scores in Grade 8 classrooms for each scale on the MSCEI attest to this, but the increased magnitude of difference between actual and preferred classroom environments in Mathematics in Grade 8 reinforce the problem. Both of these quantitative aspects of the study indicate that, across the entire sample, students' transition to Grade 8 had been deleterious, with sizeable variations in the transition experiences occurring in different individual schools depending upon the pedagogical emphases and structures developed to manage students in transition.

The significance of these findings is that educators and administrators who specifically cultivate Grade 8 Mathematics classrooms which display higher levels of Affiliation,

Autonomy, Student Cohesiveness, Task Orientation and Teacher Support are more likely to have favourable student perceptions of the classroom. Schools which cluster teachers (School A) or those which present symmetrical curriculum emphases across upper primary and lower secondary schooling (School D) are likely to engineer classroom experiences in Mathematics which limit the disjuncture and discontinuity associated with transition to secondary school, even though transition is often associated with a larger cohort of students and greater frequency of lesson turnover.

7.4.2 Perceptions of Grade 7 and Grade 8 English Classrooms

Comparison of the average item mean scores for Grade 7 with Grade 8 English classrooms reveals results which are similar, but not identical, to those for Mathematics classes. For the MSCEI, students perceive less Affiliation, less Autonomy, less Involvement, less Task Orientation, less Student Cohesiveness, less Teacher Support and increased Ease in Grade 8 English classrooms relative to what was apparent prior to the transition to secondary school. Apart from lower average item mean scores for classroom environment scales after transition, larger differences between actual and preferred environment in Grade 8 English classes exist for six of the seven scales relative to results for Grade 7 classrooms, thus providing another index by which the net negative impact on classroom environment associated with transition can be assessed. Both of these analyses indicate that classroom environment perceptions in Grade 8 English classes are less favourable than those in Grade 7.

When scores that were calculated to reflect the overall difference between actual and preferred perceptions of Grade 7 and Grade 8 English classrooms, a consistently diminished pattern of scores for each scale on the MSCEI was observed. Values for average item mean differences range between 0.20 for Ease (with Ease increasing), to 0.40, with most scale scores diminishing by between 0.20 and 0.30. This finding further attests to the fact that student perceptions of Grade 8 English classrooms, akin

to Grade 8 Mathematics, are less favourable than Grade 7 perceptions of classroom environment.

7.4.3 Comparison of Grade 8 English and Grade 8 Mathematics Classrooms

While similar trends in actual classroom environment perceptions exist for Mathematics and English at Grade 8, particularly in the overall deterioration on most of the scales of the MSCEI during transition, there are some differences between student perceptions of actual environment, perhaps attributable to the nature of the subjects and distinctive classroom methodologies that are employed. In general, student perceptions of English classes in Grade 8 are more favourable than those of Mathematics classes, with higher item mean scores for the scales of Affiliation, Autonomy, Student Cohesiveness and Task Orientation in English classes than Mathematics classes. Item mean scores for the scales of Teacher Support and Involvement are higher for Mathematics classes than English classes in Grade 8, but the differentials are smaller when compared with the other scales in the instrument. Student perceptions of actual Ease are higher for English than Mathematics at Grade 8.

These findings indicate that not only are aggregated changes to actual environment apparent in the transition to Grade 8, and not only are aggregated changes for the seven scales less favourable for Grade 8, but distinctive perceptual differences exist between subjects in Grade 8. These results support earlier findings of students in transition:

- Students perceive less teacher support following transition to secondary school (Feldlaufer, Midgley & Eccles, 1988).
- Decreased opportunities exist for classroom interaction and involvement in secondary school (Feldlaufer, Midgley & Eccles, 1988).
- Increased ease of work is experienced by some students (Feldlaufer, Midgley & Eccles, 1988), which is supported by perceptions of Grade 8 English classes.

- Adjustments to secondary classrooms provide discontinuities and difficulties, which are exacerbated by larger school size (Ferguson & Fraser, 1996, 1998).

However, as much as these findings corroborate earlier work, they also distinguish between subject-specific perceptions of the classroom environment in Grade 8, which show a generally less favourable impression of Mathematics classes when compared to English.

These findings address the third research question – Does the transition to secondary school affect student perceptions of the classroom environment? Findings suggest that Grade 8 students in the six sample schools perceive less positive actual perceptions of the classroom environment in both Mathematics and English relative to Grade 7, but that the size of the decrease varies with the environment scale and the school subject. Overall, student perceptions of the actual environment of Mathematics classes are less favourable than for English classes.

7.5 Associations Between Student Satisfaction and Dimensions of Classroom Environment

This research part of the study aimed to address whether the level of student satisfaction is associated with classroom environment scales through the question:

> **What dimensions of classroom environment during the transition to secondary school are most closely associated with student satisfaction?**

Satisfaction, was used as a dependent variable. The alpha reliabilities for Satisfaction were 0.90 in Grade 7 and 0.79 and 0.78 for Grade 8 English and Mathematics, respectively, when using the individual as the unit of analysis, and was 0.90 for Grade

7 and 0.87 and 0.82 for Grade 8 English and Mathematics, respectively, when using the class mean as the unit of analysis. These values suggest adequate reliability for the satisfaction scale.

Simple correlations (r), standardised regression coefficients (ß) and multiple correlations (R) between satisfaction and the seven scales on the MSCEI were calculated. Statistically significant ($p<0.01$) simple correlations were found between each environment scale and satisfaction, with correlations ranging between 0.33 and 0.98 for Grade 7, between 0.21 and 0.91 for Grade 8 English, and between 0.30 and 0.88 for Grade 8 Mathematics using the class as the unit of analysis. Using the individual as the unit of analysis, correlations ranged between 0.20 and 0.67 for Grade 7, between 0.25 and 0.63 for Grade 8 English and between 0.28 and 0.60 for Grade 8 Mathematics. These correlation coefficients were significant and positive for all scales in Grade 7 and Grade 8, with the exception of Ease for Grade 7 for both units of analysis, and for Grade 8 English using the class as the unit of analysis.

Multiple regression analysis was used to provide a more parsimonious explanation of the joint relationship between the MSCEI scales and satisfaction. The multiple correlation (R) was 0.77 for individual scores and 0.94 for the class as the unit of analysis in Grade 7; 0.72 for individual scores and 0.93 for the class as the unit of analysis for Grade 8 English; and 0.69 for individual scores and 0.93 for the class as the unit of analysis in Grade 8 Mathematics. These values suggest an indicating strong association between satisfaction and classroom environment scales in the MSCEI. In order to interpret the multiple correlations, the standardised regression coefficients (ß) were examined to see which of the MSCEI scales were most closely associated with satisfaction when the other MSCEI scales were mutually controlled. Results depended on the unit of analysis, but scales that were commonly, significantly and uniquely related ($p<0.01$) to student satisfaction in Grade 8 English and Grade 8 Mathematics were Affiliation, Autonomy and Teacher Support. It is interesting that the scales of

Affiliation and Autonomy were significantly related to student satisfaction in Grade 7 also.

The relationship between satisfaction as a dependent variable and the scales of Affiliation, Autonomy and Teacher Support in Grade 8 classrooms holds a number of implications for this study. Aggregated data analysis revealed that the magnitude of the difference between perceptions of actual and preferred classrooms was larger in Grade 8 than Grade 7. Coincidentally, the scales which showed greatest change across transition, namely, Affiliation, Autonomy and Teacher Support, are the ones that are most closely associated with student satisfaction. It seems that the transition to Grade 8 not only was linked with deterioration in the classroom environment, but also impacted negatively on the scales which are most strongly related to student satisfaction in Grade 8. The transition to Grade 8 therefore was a 'double whammy', , not only associated with a deterioration in classroom environment, but also with changes in those environment dimensions from which students seem to derive satisfaction.

Contemporary literature and research into middle schooling attest to the importance of avoiding alienation through developing a sense of belonging and identity (Cormack, 1996a), being given opportunities for independence and autonomy (Eyers, Cormack & Barratt, 1993), and developing mutually enriching and stable relationships between teachers and students (Barratt, 1998; Ferguson & Fraser, 1996, 1998). The current research establishes strong associations between student satisfaction and perceptions of classroom environment scales for Affiliation, Autonomy and Teacher Support, and this supports and confirms other research in the field.

7.6 Structural Approaches and Teaching Emphases Associated with Favourable Transition Experiences

Qualitative data were gathered through classroom observations, discussions with teachers, administrators and students in order to address the research question:

> **Do different site-specific approaches to middle schooling consistent with favourable transition experiences for students moving between primary and secondary school?**

In each of the six secondary schools involved in the research, a larger number of teachers, more frequent lesson turnover and greater exposure to specialist facilities outside of classroom-based learning were central to the transition to Grade 8, although more graduated experiences were provided in some schools with clustered teaching arrangements and pedagogical emphases consistent with middle schooling. In most schools involved in the research sample, ability grouping in English and Mathematics (setting rather than streaming) was practised in Grade 8, and this holds a number of practical advantages for teaching and learning, but compounds the dynamic and changeable classroom environment that students experience. The next section briefly reviews findings from qualitative data, including school context (Section 7.6.1), structural approaches towards middle schooling adopted by the schools in the research sample (Section 7.6.2), and the pedagogical emphases utilised at the classroom level.

7.6.1 School Context

From the researcher's perspective, classroom environments in Grade 7 and Grade 8 cannot be removed from the school context in which they operate. Schools which are able to condition students to high expectations of behaviour and work requirements (School A, C and D) have orderly classrooms where students possess a clear sense of

purpose and direction. While individual school profiles of students' perceptions of classroom environment dimensions vary, the overall setting and tone of the school was apparent. One of the sample schools included in the research (School B) experiences a number of behavioural, socio-cultural and economic problems that transcend the specific context of the classroom. Classroom expectations and management issues in School B noticeably affected the climate of the classroom, with students exhibiting greater absenteeism, a greater volume and severity of management issues, not infrequent disinclination, and a greater frequency of 'off-task' behaviours. One of the unintended outcomes of this research, produced through qualitative data gathering, is insight about the prevailing influence of school climate on the nature of classroom environments, particularly for the way it can affect student perceptions of classroom environments as they move from one phase of schooling to the next. It is asserted in Chapter 6 that the interplay between school environment and classroom environment is significant, in explaining some of the individual school profiles of students' perceptions of classroom environments in transition.

7.6.2 Structural Approaches to Middle School and Classroom Environment Perceptions

In schools in the present study where defined and articulated management structures exist and are replicated across primary and secondary schooling, generally favourable perceptions of classroom environment are reported. School A, which has a middle school coordinator, and clustered teaching arrangements through 'key teachers' who teach across Grade 7 and Grade 8, has relatively favourable perceptions of classroom environment in both upper primary and lower secondary school. A strong philosophical attachment to pastoral care programs in School A, the interface of which finds its expression at the classroom level with key teachers doubling as classroom teachers, seems to have produced a positive transition experience and favourable perceptions of the classroom environment (see Figures 6.1 and 6.2).

Although School B has an innovative and articulated philosophical view of middle schooling, student perceptions of the classroom environment deteriorated during the transition to secondary school. From the researcher's perspective, a large diminution in average item mean scores between Grade 7 and Grade 8 for each classroom environment scale can be explained by the fact that collective instruction by one teacher, with the remaining teachers in a support capacity, provided difficulties for students and management problems for teachers. Despite the best efforts of a highly-committed coordinator of the middle school in School B, and a group of teachers keen to provide meaningful learning experiences for the students, an unsettled classroom environment that contained many 'off-task' behaviours was observed both in Grade 7 and Grade 8.

School C and School D, both of which have high student expectations and a strong commitment towards student learning and student achievement, have orderly and settled classroom environments. Neither school, however, has an overarching middle school management structure for students in transition between Grade 7 and Grade 8. While high average item mean scores for each scale on the MSCEI are reported for School C, still a noticeable deterioration in classroom environment occurred after transition to secondary school. This was compounded by quite disparate pedagogical emphases in Grade 7 and Grade 8, involving high levels of cooperative learning and team teaching arrangements in Grade 7 that conditioned a highly relational classroom environment, as distinct from the more mechanical, teacher-centred regime with high lesson turnover and multiple specialist teachers in Grade 8. This was exacerbated further by ability-grouped classes in Mathematics and English in School C, in which students found themselves belonging to three or four classroom groups on any given day, which is in stark contrast to the fixed and stable classroom arrangements in Grade 7. This could explain the less positive perceptions of classroom environments on most scales of the MSCEI after transition to Grade 8 in School C. In the absence of formal middle school structures, such as clustered teaching arrangements, a middle school

coordinator or collaborative teaching and learning strategies, students in School D conform to high behavioural standards and strident work requirements at the classroom level. In addition, School D has constructivist learning environments through the Primary Years Program (PYP) and the Middle Years Program (MYP), which condition student-centred classrooms with an emphasis on inquiry learning. This curriculum framework and pedagogical emphasis are consistent across Grade 7 and Grade 8 classrooms in School D, providing students with relatively favourable perceptions of learning environment after transition to secondary school, largely as a result of replicated learning styles and emphases, rather than specific middle school management structures.

7.6.3 Pedagogical Emphases and Classroom Environment

Two key pedagogical emphases that were replicated across Grade 7 and Grade 8 appear to be linked to favourable perceptions of the classroom environment. Cooperative learning modalities, adopted in Grade 7 and Grade 8 in School A, and widely used in School C in Grade 7 but not in Grade 8, seem to contribute to high average scores for many of the classroom environment scales. Where structured and accountable cooperative learning practices are provided for students, higher scores for Autonomy, Student Cohesiveness, Teacher Support and Task Orientation are apparent in Grade 7 and Grade 8. However, despite the positive scores associated with cooperative learning in Grade 7, perceptions of classroom environment dimensions on the MSCEI declined during the transition to School C. The size of the change in MSCEI scores during transition in School C further attests to the lack of congruence in pedagogical emphases between the teaching and learning environment in Grade 7 and Grade 8.

School B, with its unique contextual issues, aims to soften the impact of transition by developing team-teaching and cooperative learning strategies through collective

instructional teaching. The larger number of students, less individualised support for student learning and the site-specific issues associated with disinclination, absenteeism and behaviour management, as well as the socio-economic context of School B, appear to negate the impact of pedagogical emphases designed to graduate the change from primary to secondary school.

School D, which has students in Grade 7 and Grade 8, is one of a handful of schools in South Australia that have adopted the codified principles of constructivism across the entire school. While the average environment scores for School D are not high in Grade 7, there is an overall improvement in perceptions of the classroom environment dimensions of Autonomy, Teacher Support, Task Orientation and Involvement in Grade 8. Given the curriculum emphases of the PYP and MYP programs, which foster inquiry and student-centred approaches to learning in the context of the principles of constructivist classrooms, it is not surprising to see a greater coherence between student perceptions of primary and secondary classroom environments.

Therefore, two main pedagogical emphases, cooperative learning in context of a strong regard for pastoral care and positive student-teacher relationships, along with the implementation of established principles of constructivism in Grade 7 and Grade 8, seem to be associated with the most favourable transition experiences for students in the research sample. In schools where levels of Teacher Support, Task Orientation and Autonomy remain high in Grade 8, higher levels of student satisfaction are likely as a result of the strong empirical associations between Satisfaction as a dependent variable and the scales of Teacher Support and Autonomy. In the six sample schools in the research, students' perceptions of Affiliation diminished sizably across transition, largely as a result of an increased number of specialist teachers, high lesson turnover, larger number of students, and setting arrangements which apply in English and Mathematics classes in Grade 8.

7.6.4 Conclusion

Qualitative data have enabled a more detailed analysis and greater discernment of the transition experiences of students from the six sample schools involved in the research. School context, structural provision and management of students moving between Grade 7 and Grade 8, and pedagogical emphases such as cooperative leaning modalities and constructivism, affect students' perceptions of their classroom environment. Qualitative data address the final research question in this study:

> **Are site-specific provisions for middle schooling consistent with favourable transition experiences for students moving between primary and secondary school?**

Schools which have consistently high standards of student behaviour, defined work requirements and orderly classrooms, complemented by cooperative learning modalities and coherent pedagogical emphases between Grade 7 and Grade 8, are likely to provide students with more favourable transition experiences between primary and secondary school. Schools which have a management and coordination structure, such as key teachers and a designated administrator, are also likely to provide positive transition experiences if other influencing factors as described above are attended to. While problems of Affiliation are evident in secondary schools, primarily as a result of the larger number of students in secondary schools and multiple specialist teachers with higher lesson turnover, the disjuncture associated with transition can be minimised by school-specific measures that provide greater consistency in classroom environments between primary and secondary school.

7.7 Summary of Main Findings

The objectives of the study were to measure students' perceptions of their classroom environments in Grade 7 and Grade 8, and to see if changes in environment occur across the transition to secondary school. The main results are summarised below:

1. The Middle School Classroom Environment Indicator was developed and found to be a valid and reliable instrument for measuring dimensions of classroom environment in upper primary and lower secondary schooling. The MSCEI was constructed after much investigation of current literature in the areas of middle schooling and classroom environment, and consultation with students facing the transition to secondary school. This produced a set of scales and items that are salient indicators of the distinctive environments of middle school classrooms, and able to measure student perceptions of Grade 7 and Grade 8 classrooms.

2. Sizeable differences between perceptions of actual and preferred classrooms exist in Grade 7, Grade 8 English and Grade 8 Mathematics classrooms in the six schools involved in this study. Relative to Grade 7, larger differences between perceptions of actual and preferred classroom environment exist in Grade 8 English and Mathematics classrooms for the scales of Affiliation, Involvement, Student Cohesiveness, Task Orientation and Teacher Support. Relative to Grade 7, differences of smaller magnitude exists between preferred and actual environment for the scales of Ease and Autonomy.

3. Sizeable deteriorations in perceptions of actual classroom environment occur across transition from Grade 7 to Grade 8 English and Mathematics. For the scales of Affiliation, Autonomy, Student Cohesiveness, Teacher Support, Task Orientation and Involvement, lower environment mean scores exist in Grade 8 classrooms than in Grade 7. For the scale of Ease, a lower mean score (i.e.

increased Ease) exists for English, but a higher mean score (i.e. reduced Ease) exists for Mathematics. In general, student perceptions of actual classroom environments diminish sizably across transition.

4. Overall, less favourable student perceptions of actual environment exist in Grade 8 Mathematics classrooms compared to Grade 8 English classrooms. In Grade 8 Mathematics, notably lower scores exist for the scales of Affiliation, Autonomy, Student Cohesiveness and Task Orientation than exist in Grade 8 English classrooms.

5. Student satisfaction as a dependent variable, is most closely associated with the classroom environment scales of Affiliation, Autonomy and Teacher Support in Grade 8. This was established through statistical procedures involving simple correlation analysis (r), multiple correlations (R) and standardised regression coefficients (ß). The present research suggests that decreases across transition in the three classroom environment scales of Affiliation, Autonomy and Teacher Support are likely to impact negatively on student perceptions of satisfaction. Coincidentally, the largest difference between actual and preferred classroom environments after transition to Grade 8 is in the scales of Affiliation, Autonomy and Teacher Support.

6. Qualitative data suggest that school-specific initiatives developed in Grade 7 and Grade 8, respectively, have the capacity to condition more favourable transition experiences for students. Coordination and articulation of middle school emphases, particularly structural interventions such as clustered teaching arrangements, concerted efforts to build relationships between teachers and students, cooperative learning modalities and constructivist curriculum experiences, have the potential to limit the disjuncture associated with the transition to secondary school.

7.8 Further Research and Future Directions

This study has revealed a number of findings, some of which suggest directions for future research into middle school classroom environments and the transition experience of students between primary and secondary school:

- Investigations could be conducted into why students' perceptions of preferred classroom environments alter during the shift from Grade 7 to Grade 8. This could be associated with diminished expectations of classroom environments in secondary school.
- Interventions in Grade 8 classrooms aimed at improvement (Fraser, 1981a, 1981b; Fisher & Fraser, 1983b, 1986; Thorp, Burden & Fraser, 1994) could be carried out to see whether specific changes to the learning environment in key areas, such as Affiliation, Autonomy and Teacher Support, can condition more favourable student perceptions of the classroom environment.
- Further research could be conducted into the quality of student-teacher relationships, which loom as something of a fulcrum in favourable classroom environments in Grade 8 (Feldlaufer, Midgley & Eccles, 1988; Ferguson & Fraser, 1996, 1998; Wubbels, Brekelmans & Hermans, 1988; Wubbels, Brekelmans & Hooymayers, 1991), despite subtly different educational emphases and schooling structures.
- Further research is needed which will provide a clearer understanding of reasons for diminished student perceptions of Affiliation, which poses risks for student alienation (Cormack, 1996a) and disinclination (Lounsbury & Clarke, 1990).
- Investigation into classroom experiences that heighten student perceptions of Autonomy in Grade 8, which allow students to engage in meaningful, discerning and accountable independent learning (Eyers, Cormack & Barratt, 1993), would be desirable.

- A more detailed understanding of the complex relationship between school context and perceptions of classroom environment could form the basis of future research.
- Further investigation is desirable into specific teaching and learning emphases which support more favourable perceptions of the classroom environment reported in this study, particularly in the move between primary and secondary school. This specifically includes cooperative learning modalities and constructivist learning environments.
- Investigation into associations classroom environment and a broader range of student cognitive and affective outcomes would be desirable at the middle school level.

7.9 Limitations of this Study

This study has a number of limitations and qualifications that should be considered in generalising findings to students in different schools and classroom environments outside of the research sample:

1. Students in South Australia face the transition to secondary school at 12 or 13 years of age, which is different from some other schooling systems throughout Australia. This is because students in South Australia (and Western Australia) generally undertake one year of Reception and seven years of primary school, whereas students in other states generally undertake one year of Reception followed by six years of primary school, before transferring into secondary school at Grade 7. Students in other states are likely to be of a different chronological age to those making the transition in South Australia, and their perceptions of classroom environments could vary with student age and context.
2. The research sample consisting of 311 students was not large, and therefore it was more difficult to conduct certain multivariate analyses.

3. Although qualitative measures added depth, interpretation and explanation to the quantitative findings in the study, qualitative data findings do not lend themselves to generalisations beyond this study, particularly as schools selected for the sample were of different types, with different enrolment profiles, varying contexts, distinct management frameworks and curriculum emphases in Grade 7 and Grade 8, respectively.
4. The timing of questionnaire administration and qualitative data gathering are problematic, and results are pertinent to the student perceptions of classroom environment provided at the time. Were the timing of data collection in this longitudinal study to have been earlier in Grade 7 or later in Grade 8, different perceptions of classroom environment might have been forthcoming and produced different interpretations and explanations.
5. This study was limited to associations between student satisfaction and classroom environment scales on the MSCEI. Other outcomes, such as student achievement, could provide the basis of fruitful investigation and research in the future.

7.10 Final Remarks

There are four distinctive contributions that this study has made to our understanding of classroom environments in middle school, and student perceptions of the transition between primary and secondary school. First, the Middle School Classroom Environment Indicator is not an 'inherited' instrument: it was designed specifically to measure perceptions of classroom environments in upper primary and lower secondary school. It was aimed to provide maximum salience to the quantitative data that was gathered in the present study.

Second, because secondary classrooms have multiple teachers often embroiled in subject-specific teaching and learning ideologies, this study utilised perceptions of

classroom environment in Grade 8 English and Grade 8 Mathematics classes. Three data sets were gathered, analysed and interpreted in this study – Grade 7, Grade 8 English and Grade 8 Mathematics. These findings not only indicate different perceptions of classroom environments between primary and secondary school, but also include differences between subjects in Grade 8.

Third, a student reference group and qualitative data gathering were employed to calibrate the instrument used in the research. It is assumed, that by the time the instrument was provisionally constructed, cross-referenced with colleagues and student participants, it would have sound readability and relevance for the student group for which it was devised.

Fourth, this study utilised extensive qualitative data gathering that was triangulated against the aggregated quantitative data and individual school profiles. Because the schools selected for the study have quite different contexts, management structures, teaching and curriculum emphases in Grade 7 and Grade 8, it was believed important to continue quantitative and qualitative methods.

It is hoped that the findings of this study, together with suggestions for future research into middle school classroom environments, will stimulate further research and understanding of this important stage of education.

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APPENDICES

APPENDIX A

Middle School Classroom Environment Indicator

(MSCEI)

Preferred Form

Grade 7

Directions: This is not a test. There are no right or wrong answers. Your opinion is what is wanted. These questions are to find out how strongly you would ***prefer*** your classroom to be. It is not about how you classroom actually is, but how you would prefer it to be.

You will be asked to circle one number for each question. The numbers are as follows:

Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
1	2	3	4	5

Practice example: Suppose you are given the statement

I would be challenged in this class.

You need to decide whether you would prefer to be challenged in this class. If you strongly agree, you need to circle the number 1. On the other hand, if you would prefer not to be challenged you would circle the number 5.

Place your response on the sheet wherever you believe it best fits.

Don't forget to write your name and details at the top of the sheet.

Many thanks for your time and responses.

NAME ... ... SCHOOL ... ... CLASS ... ...

DATE ... ...

Remember that you are describing your ***preferred*** classroom

EASE	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
1. I would find the work in this class easy.	1	2	3	4	5
2. I would have the time to finish my work.	1	2	3	4	5
3. I would be challenged in this class.	1	2	3	4	5
4. I would find tests and assignments easy.	1	2	3	4	5
5. I would find new work easy.	1	2	3	4	5
6. I would find homework easy.	1	2	3	4	5
AFF	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
7. I would belong to this class.	1	2	3	4	5
8. I would be safe in this class.	1	2	3	4	5
9. I would enjoy being a member of this class.	1	2	3	4	5
10. I would be included in class activities.	1	2	3	4	5
11. I would help new members to this class settle in.	1	2	3	4	5
12. I would be proud to be a member of this class.	1	2	3	4	5
COM	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
13. I would speak openly and honestly in class.	1	2	3	4	5
14. I would be comfortable expressing opinions.	1	2	3	4	5
15. I would listen to the opinions of other students.	1	2	3	4	5
16. I would know what is going on in this class.	1	2	3	4	5
17. I would be involved in important discussions.	1	2	3	4	5
18. I would talk with my parents about class activities.	1	2	3	4	5
AU/I	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
19. I would have a say in how my class time is used.	1	2	3	4	5
20. The teacher would decide how much talk and movement I am allowed.	1	2	3	4	5
21. I would be given a choice of assignments.	1	2	3	4	5
22. I would work at my own pace.	1	2	3	4	5
23. The teacher would decide when I move on to a new topic.	1	2	3	4	5
24. I would have a say in deciding about activities I do.	1	2	3	4	5
SCO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
25. I would make friendships among students of this class.	1	2	3	4	5
26. I would know other students in this class.	1	2	3	4	5
27. I would help other class members who are having trouble with their work.	1	2	3	4	5
28. Students in this class would like me.	1	2	3	4	5
29. Students in this class would help me with homework.	1	2	3	4	5
30. I would do favours for members of this class.	1	2	3	4	5

TSU	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
31. The teacher would take a personal interest in me.	1	2	3	4	5
32. The teacher would help me when I have trouble with work.	1	2	3	4	5
33. The teacher would move about the class to talk to me.	1	2	3	4	5
34. The teacher would understand me.	1	2	3	4	5
35. The teacher's questions would help me to understand.	1	2	3	4	5
36. It would be alright with the teacher if I am slower than other students.	1	2	3	4	5
COO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
37. I would cooperate with other students when doing assignments.	1	2	3	4	5
38. When I work in groups in this class, there would be teamwork.	1	2	3	4	5
39. I would learn from other students in this class.	1	2	3	4	5
40. Students would work with me to achieve class goals.	1	2	3	4	5
41. I would cooperate with other students on class activities.	1	2	3	4	5
42. During group work, I would do my share of the work.	1	2	3	4	5
TAO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
43. I would know what has to be done in this class.	1	2	3	4	5
44. Getting a certain amount of work done would be important to me.	1	2	3	4	5
45. Class assignments are clear so I would know what to do.	1	2	3	4	5
46. I would know the goals for this class.	1	2	3	4	5
47. I would be ready to star this class on time.	1	2	3	4	5
48. I would pay attention during class.	1	2	3	4	5
INV	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
49. I would discuss ideas in class.	1	2	3	4	5
50. My ideas and suggestions would be used during class discussions.	1	2	3	4	5
51. The teacher would ask me questions.	1	2	3	4	5
52. I would explain my ideas to other students.	1	2	3	4	5
53. I would be asked to explain how to solve problems.	1	2	3	4	5
54. Students would discuss with me how to solve problems.	1	2	3	4	5

APPENDIX B

Middle School Classroom Environment Indicator

(MSCEI)

Actual Form

Grade 7

Directions: This is not a test. There are no right or wrong answers. Your opinion is what is wanted. These questions are to find out what your class is ***actually like*** for you.

You will be asked to circle one number for each question. The numbers are as follows:

Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
1	2	3	4	5

Practice example: Suppose you are given the statement

I enjoy being a member of this class.

You need to decide if you actually enjoy belonging to the class. If you really do like being in the class you would circle the number 1. If you really don't like being in the class, you would circle the number 5.

Place your response on the sheet wherever you believe it best fits.

Don't forget to write your name and details at the top of the sheet.

Many thanks for your time and responses.

NAME ... ... SCHOOL ... ... CLASS ... ...

DATE ... ...

Remember that you are describing your ***actual*** classroom

EASE	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
1. I find the work in this class easy.	1	2	3	4	5
2. I have the time to finish my work.	1	2	3	4	5
3. I am challenged in this class.	1	2	3	4	5
4. I find tests and assignments easy.	1	2	3	4	5
5. New work is easy for me.	1	2	3	4	5
6. I find homework easy.	1	2	3	4	5
AFF	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
7. I belong to this class.	1	2	3	4	5
8. I am safe in this class.	1	2	3	4	5
9. I enjoy being a member of this class.	1	2	3	4	5
10. I am included in class activities.	1	2	3	4	5
11. I help new members to this class settle in.	1	2	3	4	5
12. I am proud to be a member of this class.	1	2	3	4	5
COM	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
13. I speak openly and honestly in class.	1	2	3	4	5
14. I am comfortable expressing opinions.	1	2	3	4	5
15. I listen to the opinions of other students.	1	2	3	4	5
16. I know what is going on in this class.	1	2	3	4	5
17. I am involved in important discussions.	1	2	3	4	5
18. I talk with my parents about class activities.	1	2	3	4	5
AU/I	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
19. I have a say in how my class time is used.	1	2	3	4	5
20. The teacher decides how much talk and movement I am allowed.	1	2	3	4	5
21. I am given a choice of assignments.	1	2	3	4	5
22. I work at my own pace.	1	2	3	4	5
23. The teacher decides when I move on to a new topic.	1	2	3	4	5
24. I have a say in deciding about activities I do.	1	2	3	4	5
SCO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
25. I make friendships among students of this class.	1	2	3	4	5
26. I know other students in this class.	1	2	3	4	5
27. I help other class members who are having trouble with their work.	1	2	3	4	5
28. Students in this class like me.	1	2	3	4	5
29. Students in this class help me with homework.	1	2	3	4	5
30. I do favours for members of this class.	1	2	3	4	5

TSU	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
31. The teacher takes a personal interest in me.	1	2	3	4	5
32. The teacher helps me when I have trouble with work.	1	2	3	4	5
33. The teacher moves about the class to talk to me.	1	2	3	4	5
34. The teacher understands me.	1	2	3	4	5
35. The teacher's questions help me to understand.	1	2	3	4	5
36. It is alright with the teacher if I am slower than other students.	1	2	3	4	5
COO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
37. I cooperate with other students when doing assignments.	1	2	3	4	5
38. When I work in groups in this class, there is teamwork.	1	2	3	4	5
39. I learn from other students in this class.	1	2	3	4	5
40. Students work with me to achieve class goals.	1	2	3	4	5
41. I cooperate with other students on class activities.	1	2	3	4	5
42. During group work, I do my share of the work.	1	2	3	4	5
TAO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
43. I know what has to be done in this class.	1	2	3	4	5
44. Getting a certain amount of work done is important to me.	1	2	3	4	5
45. Class assignments are clear so I know what to do.	1	2	3	4	5
46. I know the goals for this class.	1	2	3	4	5
47. I am ready to star this class on time.	1	2	3	4	5
48. I pay attention during class.	1	2	3	4	5
INV	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
49. I discuss ideas in class.	1	2	3	4	5
50. My ideas and suggestions are used during class discussions.	1	2	3	4	5
51. The teacher asks me questions.	1	2	3	4	5
52. I explain my ideas to other students.	1	2	3	4	5
53. I am asked to explain how to solve problems.	1	2	3	4	5
54. Students discuss with me how to solve problems.	1	2	3	4	5
SAT	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
55. Being in this class is enjoyable.	1	2	3	4	5
56. This class is fun.	1	2	3	4	5
57. Students are happy in this class.	1	2	3	4	5
58. Students in this class are satisfied with their work.	1	2	3	4	5
59. Students look forward to coming to this class.	1	2	3	4	5
60. I like being in this class.	1	2	3	4	5

APPENDIX C

Middle School Classroom Environment Indicator (MSCEI)

Preferred Form

Grade 8

Directions: This is not a test. There are no right or wrong answers. Your opinion is what is wanted. These questions are to find out how strongly you would ***prefer*** your classroom to be. It is not about how you classroom actually is, but how you would prefer it to be.

You will be asked to circle one number for each question. The numbers are as follows:

Strongly Agree	**Agree**	**Can't Decide**	**Disagree**	**Strongly Disagree**
1	**2**	**3**	**4**	**5**

Practice example: Suppose you are given the statement

I would be challenged in this class.

You need to decide whether you would prefer to be challenged in this class. If you strongly agree you need to circle the number 1. On the other hand, if you would prefer not to be challenged you would circle the number 5.

Place your response on the sheet wherever you believe it best fits.

Don't forget to write your name and details at the top of the sheet.

Many thanks for your time and responses.

NAME ... ... SCHOOL ... ... CLASS ... ...

DATE ... ...

Remember that you are describing your ***preferred*** classroom

EASE	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
1. I would find the work in this class easy.	1	2	3	4	5
4. I would find tests and assignments easy.	1	2	3	4	5
5. I would find new work easy.	1	2	3	4	5
6. I would find homework easy.	1	2	3	4	5
AFF	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
7. I would belong to this class.	1	2	3	4	5
8. I would be safe in this class.	1	2	3	4	5
9. I would enjoy being a member of this class.	1	2	3	4	5
10. I would be included in class activities.	1	2	3	4	5
12. I would be proud to be a member of this class.	1	2	3	4	5
AU/I	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
19. I would have a say in how my class time is used.	1	2	3	4	5
21. I would be given a choice of assignments.	1	2	3	4	5
22. I would work at my own pace.	1	2	3	4	5
24. I would have a say in deciding about activities I do.	1	2	3	4	5
SCO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
27. I would help other class members who are having trouble with their work.	1	2	3	4	5
30. I would do favours for members of this class.	1	2	3	4	5
31. I would cooperate with other students when doing assignments.	1	2	3	4	5
38. When I work in groups in this class, there would be teamwork.	1	2	3	4	5
41. I would cooperate with other students in class activities.	1	2	3	4	5
42. During group work, I would do my share of the work.	1	2	3	4	5
TSU	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
31. The teacher would take a personal interest in me.	1	2	3	4	5
32. The teacher would help me when I have trouble with work.	1	2	3	4	5
33. The teacher would move about the class to talk to me.	1	2	3	4	5
34. The teacher would understand me.	1	2	3	4	5
35. The teacher's questions would help me to understand.	1	2	3	4	5

TAO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
43. I would know what has to be done in this class.	1	2	3	4	5
45. Class assignments are clear so I would know what to do.	1	2	3	4	5
46. I would know the goals for this class.	1	2	3	4	5
47. I would be ready to star this class on time.	1	2	3	4	5
INV	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
49. I would discuss ideas in class.	1	2	3	4	5
50. My ideas and suggestions would be used during class discussions.	1	2	3	4	5
51. The teacher would ask me questions.	1	2	3	4	5
52. I would explain my ideas to other students.	1	2	3	4	5
53. I would be asked to explain how to solve problems.	1	2	3	4	5
54. Students would discuss with me how to solve problems.	1	2	3	4	5

APPENDIX D

Middle School Classroom Environment Indicator (MSCEI)

Actual Form

Grade 8

Directions: This is not a test. There are no right or wrong answers. Your opinion is what is wanted. These questions are to find out what your class is ***actually like*** for you.

You will be asked to circle one number for each question. The numbers are as follows:

Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
1	**2**	**3**	**4**	**5**

Practice example: Suppose you are given the statement

I enjoy being a member of this class.

You need to decide if you actually enjoy belonging to the class. If you really do like being in the class you would circle the number 1. If you really don't like being in the class, you would circle the number 5.

Place your response on the sheet wherever you believe it best fits.

Don't forget to write your name and details at the top of the sheet.

Many thanks for your time and responses.

TSU	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
31. The teacher takes a personal interest in me.	1	2	3	4	5	1	2	3	4	5
32. The teacher helps me when I have trouble with the work.	1	2	3	4	5	1	2	3	4	5
33. The teacher moves about the class to talk to me.	1	2	3	4	5	1	2	3	4	5
34. The teacher understands me.	1	2	3	4	5	1	2	3	4	5
35. The teacher's questions help me to understand.	1	2	3	4	5	1	2	3	4	5
TAO	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
43. I know what has to be done in this class.	1	2	3	4	5	1	2	3	4	5
45. Class assignments are clear so I know what to do.	1	2	3	4	5	1	2	3	4	5
46. The goals for this class are clear.	1	2	3	4	5	1	2	3	4	5
47. I am ready to start this class on time.	1	2	3	4	5	1	2	3	4	5
INV	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
50. My ideas and suggestions are used during class discussions.	1	2	3	4	5	1	2	3	4	5
51. The teacher asks me questions.	1	2	3	4	5	1	2	3	4	5
53. I explain my ideas to other students.	1	2	3	4	5	1	2	3	4	5
53. I am asked to explain how to solve problems.	1	2	3	4	5	1	2	3	4	5
54. Students discuss with me how to go about solving problems.	1	2	3	4	5	1	2	3	4	5
SAT	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree	Strongly Agree	Agree	Can't Decide	Disagree	Strongly Disagree
55. Being in this class is enjoyable.	1	2	3	4	5	1	2	3	4	5
56. This class is fun.	1	2	3	4	5	1	2	3	4	5
57. Students are happy in this class.	1	2	3	4	5	1	2	3	4	5
58. Students in this class are satisfied with their work.	1	2	3	4	5	1	2	3	4	5
59. Students look forward to coming to this class.	1	2	3	4	5	1	2	3	4	5
60. I like being in this class.	1	2	3	4	5	1	2	3	4	5