A VALIDATION STUDY OF THE ELEMENTARY VERSION OF THE QUESTIONNAIRE ON TEACHER INTERACTION IN A SAMPLE OF MITCHELLS PLAIN SCHOOLS

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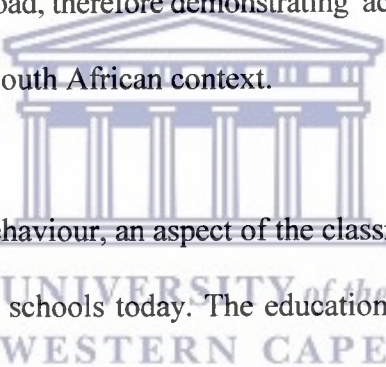
WESTERN CAPE

2000

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UNIVERSITY OF THE WESTERN CAPE

ABSTRACT

The focus of this research is to validate the elementary version of the Questionnaire on Teacher Interaction (QTI), adapted from the original high school version developed in the Netherlands, on a South African sample. The QTI, a paper and pencil measure of teacher interpersonal behaviour within educational settings consists of forty-eight items across eight scale categories of behaviour and was administered to a total of 485 learners in six schools located in the Mitchells Plain district of Cape Town. Validity was assessed through internal consistency reliability and scale inter-correlations. The findings of this study are largely consistent with results obtained in similar studies abroad, therefore demonstrating acceptable levels of reliability and validity for the instrument in a South African context.

Research on teacher interpersonal behaviour, an aspect of the classroom learning environment is a relevant issue in South African schools today. The education system in South Africa is currently having to endure many changes on different levels. The new outcomes based curriculum requires that teachers facilitate positive learning environments within the classroom. Use of the QTI in overseas contexts has demonstrated its applicability as an effective instrument in determining the inset and preset training needs of teachers. The findings of this study clearly suggest that the QTI can be applied with confidence in the South African context in supporting initiatives aimed at empowering our teachers.

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DECLARATION

I hereby declare that this dissertation, unless specifically indicated to the contrary in the text, is my own original work and that I have not submitted it, nor any parts of it, for a degree at any other university.

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ACKNOWLEDGEMENTS

The author wishes to express thanks and appreciation to the following people:

My wife Avril for her steadfast support and encouragement through difficult times;

My children, Olivia, Lisa and Andrè for the countless sacrifices;

My sister Tracey-Ann, for listening;

My colleagues at the Philippi East School Clinic for their patience and support;

and my supervisor, Tania Vergnani for teaching me how to write a thesis.

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CHAPTER ONE

INTRODUCTION

1.1 Background

Over the past few years a range of new policies and a new curriculum have been introduced into the South African education system, which have made a dramatic impact on schools in several areas, such as, governance, curriculum and teaching, and teacher-learner ratios. The new curriculum requires that a fundamental shift be made in the mode of teaching and learning in the classroom (Cockburn, 1997). Traditionally, teachers followed a content-based or teacher-centred curriculum, which now has to change towards an outcomes-based and learner-centred approach. These developments have created a skills vacuum within schools as teachers grapple with comprehending and developing the capacity to deliver the new curriculum in the classroom.

Seen against the background of poverty and its associated social problems that affect the larger proportion of schools in this country, rationalisation of teacher posts as well as the phasing in of a new curriculum, the education system in post-Apartheid South Africa is yet again in crisis. The effects of the current transition manifest in low teacher morale, disillusionment and job insecurity, with large classes, a general lack of resources, and the inadequate training of teachers seriously compounding the problem (Davidhoff, Kaplan & Lazarus, 1994). These factors have negatively impacted on the learning environment [1] within the classroom. Learning environments can be considered as the socio-psychological contexts or determinants of learning (Fraser & Walberg, 1991, p.x).

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[1] Please note that I will be using the concepts of learning and educational environments interchangeably throughout the thesis. A more in-depth discussion of these terms will take place in chapter 2.

Within a context of limited resources, it is important that we identify and focus on those aspects of the system which will benefit most from supportive interventions. Teacher interpersonal behaviour is one such aspect. Here the focus is on the manner in which the teacher interacts with the learners i.e. the particular communication or interpersonal style of the teacher (Wubbels & Levy, 1993). From a systems perspective on classroom communication, a number of criteria relating to teacher interpersonal behaviour which encourage the establishment of healthy relationships have been identified. These will be discussed in more detail in the chapter 2. There is a need for greater focus on the teacher as an agent in the promotion of a healthy learning environment inside the classroom. Current trends in education research have increasingly focussed on the teacher (Fraser & Walberg, 1991). Until recently, teacher effectiveness was mainly attributed to the methodological aspects of his/her behaviour. This refers to the plethora of technical strategies, such as, choice and organisation of teaching materials and instructional methods, motivational strategies and assessment. There is, however, another aspect of teacher behaviour which is equally important. It has to do with the interpersonal actions which create and maintain a positive learning environment within the classroom. If the quality of the learning environment does not meet certain basic conditions, the methodological aspect loses its significance and will ultimately impact negatively on teacher effectiveness (Wubbels & Levy, 1993).

Research on learning environments has produced a number of instruments which aim to measure this phenomenon. The Questionnaire on Teacher Interaction (QTI) is one such instrument and has been used extensively in overseas contexts to measure teacher interpersonal behaviour, one of the various aspects which influences the learning environment within classrooms (Fraser,

1994). The present study is an attempt to validate the elementary version of the QTI on a South African sample.

1.2 Aim of Research

This research aims to assess the validity of the elementary version of the QTI, adapted from the original high school version developed in the Netherlands (Wubbels, Brekelmans, & Hooymayers, 1991) on a sample of learners attending primary schools in the Mitchells Plain area of Cape Town. An extensive body of research in international education settings have revealed that the QTI is indeed an effective instrument to use in the study of learning environments (Goh & Fraser, 1996). The instrument, which is discussed in more depth in Chapter 3, has been used successfully in a variety of educational contexts to inform teacher preset and inset training initiatives.
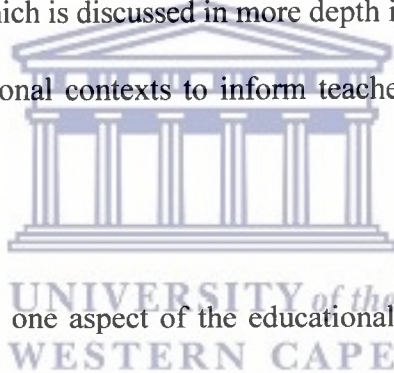
This study aims to investigate only one aspect of the educational environment, namely, the relationship between teacher and learner. The systems perspective forms the underlying theory for conceptualising teacher interpersonal behaviour. When applying systems thinking, we see the classroom as a dynamic set of relationships which form distinct patterns over time. More specifically the notion of circular communication processes contributes to our understanding of interactional patterns between the teacher and learners within the classroom. Circular communication is a cyclical process or pattern which both determines and maintains sets of behaviours or interactions inside the classroom (Wubbels & Levy, 1993). Focussing on the teacher becomes important when intervening within the classroom to facilitate the development of positive learning environments as it should be easier to change the behaviour of one person (teacher) instead of 40 to 50 learners.

1.3 Significance of Research

Use of the QTI in other countries has established interactions between teachers and learners as an important determinant of learner achievement and attitudes (Goh & Fraser, 1995; Henderson, Fisher & Fraser, 1995; Wubbels & Levy, 1991). The QTI has been successfully validated in several countries, namely, The Netherlands, USA, Israel and Australia (Goh & Fraser, 1996). It is hoped that this study may form the beginning of further validation studies conducted on a much broader scale in the South African context. Validation of the QTI, in a South African context would mean that it could form a useful instrument to gauge teacher interpersonal behaviour in our classrooms. The use of the questionnaire could inform initiatives involved in preset and inset training of teachers. It could also be used by teachers as a self-help measure to ascertain their interpersonal effectiveness. The QTI is easily administered and once scored, provides an easily understood profile of the complete range of teacher interpersonal behaviour. The profile presents a graphic picture of which behaviours occur and their frequencies. Research has established links between distinct teacher profiles and positive learner outcomes (Brekelmans, 1989). One is therefore able to distinguish between interpersonal behaviours of effective and non-effective teachers (Brekelmans, 1989). After feedback, the teacher will therefore be in a position to modify his or her repertoire of behaviours in order to enhance interpersonal functionality and therefore positively influence learner outcomes.

1.4 Brief Overview of Chapters

Chapter two details contemporary research within the field of educational environments with specific emphasis on the element of teacher interpersonal behaviour. This chapter is concluded with a systems theoretical perspective forming the basis for an understanding of classroom communication processes.

Chapter three focusses specifically on the methodology applied in the present study. It includes the purpose of this research and detailed information regarding the measuring instrument used i.e., the QTI, its purpose, the Leary Model (Leary, 1957), which forms the theoretical basis and structure of the questionnaire, the nature of the items as well as appropriate validation data. The sample, procedure employed during the research process, including an elaboration of the pilot study conducted, and the subsequent administering of the QTI to the larger sample of learner participants is described.

Chapter four comprises a theoretical discussion on the concepts of reliability and validity as applied to validation of scales. Chapter five outlines the method of data analysis and discusses issues relating to reliability and validity. This is followed by a concise report on the results obtained in the present study.
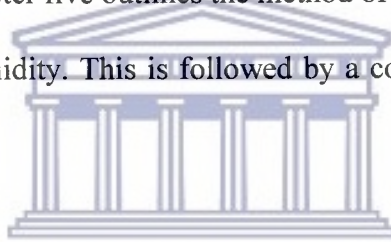
Chapter six outlines a discussion of the results obtained, how they relate to existing theory and research as well as the original objectives of the study. It includes recommendations regarding the use of the instrument within the specified context as well as further research in this field. Finally, in chapter seven the key elements of the thesis are summarised and recommendations are made for future research.

CHAPTER TWO

STUDYING CLASSROOM ENVIRONMENTS

2.1 Introduction

The chapter will comprise a review of research on learning environments. A definition of the concept learning environment will be followed by an historical account of research within the field of learning environments. This will be followed by an elaboration of the association between learning environment and learner outcomes and by a discussion of various classroom environment scales which have been developed to assess this phenomena. Practical applications of classroom environmental scales will be examined broadly as a prelude to a comprehensive discussion on teacher interpersonal behaviour and its significance in the classroom. Under discussion will be a theoretical perspective on classroom communication based largely on systems theory, which attempts to explain the occurrence of the circular patterns of interaction that exist between teachers and learners within the classroom.
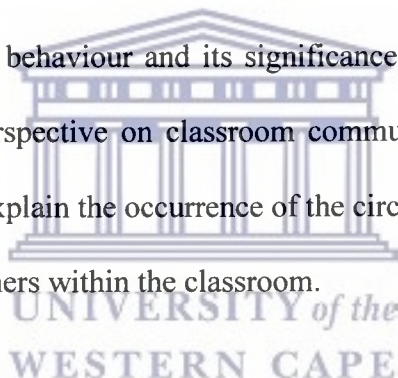
2.2 The Learning Environment

2.2.1 Introduction

As previously noted in chapter one, educational environments can be considered as the social-psychological context or one of the determinants of learning (Fraser & Walberg, 1991). Teachers often speak of a classroom or school climate, environment, atmosphere, tone, ethos, or ambience and consider it important for the attainment of educational goals (Fraser & Walberg, 1991).[1] A number of key questions can be asked regarding learning environments. For instance, does the

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[1] The term learning environment conveys the same meaning as educational or classroom climate, environment, atmosphere, tone or ethos.

learning environment within the classroom affect student learning and attitudes? What is the impact of a new curriculum or teaching method on the learning environment? Can teachers conveniently assess the environment of their own classroom and can they change it? What are some of the determinants of the learning environment? Is there a discrepancy between actual and preferred environment, as perceived by students, and does this discrepancy matter in terms of student outcomes? Do teachers and their students perceive the same classroom environment similarly (Fraser & Walberg, 1991)?

Aspects of the learning environment are subtle in that they are less deliberate than teaching content and methodology. For instance, communication between teacher and learners also occurs on a non-verbal basis (Wubbels & Levy, 1993). Clearly the emotional content of a teacher's communication will impact on the learning environment of the classroom and ultimately learner outcomes. These and other aspects of learning environments are less visible but yet powerful determinants of the learning process.
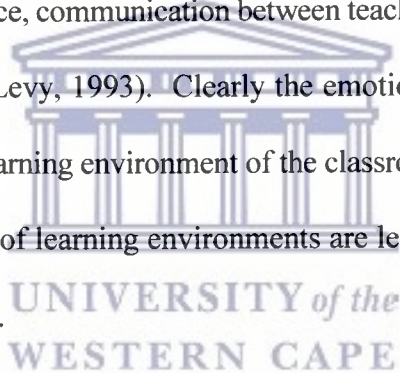
The concept of learning environment can thus also be defined as the classroom atmosphere for learning. It includes the feelings teachers and pupils have about the classroom and whether it is a place where learning can occur. A positive learning environment makes a classroom a place where both teachers and learners want to spend a considerable portion of their time. This environment can also be defined in terms of the perceptions teachers and pupils have about their classroom (Botha, no date; Pollard & Tann, 1995; Van der Westhuizen, 1991).

Van der Westhuizen (1991) points out that some classrooms have a cheerful atmosphere and they 'hum' with excitement and purpose, while others lack this kind of enthusiasm. Hoy and

Miskel (1987) purport that classroom climate is a set of internal characteristics that distinguish one classroom from the other and influence the behaviour of teachers and learners.

Van der Westhuizen (1991) further points out that the quality of the teacher and learner activity in the classroom is determined by the spirit which infuses these activities. He explains that this spirit (which encompasses, the milieu, culture, atmosphere, ethos or climate) differs from one classroom to the other. Therefore, the learning environment refers to how pupils experience the quality of their relationships with teachers. These relationships are in turn determined by the management style of the school principal and the way authority is exercised with regards to pupils as well as the quality of their mutual relationships (Van der Westhuizen, 1991).

Pollard and Tann (1995) indicate that three basic qualities are required if a warm, person-centred relationship is to be established in the classroom. These qualities are: acceptance, genuineness and empathy. These researchers point out how these qualities are applied to teaching:

▸ acceptance involves acknowledgement and receiving children as they are;

▸ genuineness implies that such acceptance is real and heartfelt;

▸ empathy suggest that a teacher is able to appreciate what classroom events feel like to children (Pollard & Tann, 1995:88)

It is subsequently imperative that those competent teachers who are committed to creating effective teaching and learning environments, should also develop the capacity to offer pupils unconditional positive regard in terms of their individuality and uniqueness.

Gathercoal (1993:84) states that a 'positive' learning environment is one with 'appropriate academic and cultural adaptation in which teachers are prepared and committed to inspire, lead and support all learners as they progress towards the achievement of their greatest potential; has clearly defined expectations for learner behaviour; concern for the whole child and a learner-centred teaching focus.' Peters (1995) states further that in the learning environment the teacher is the manager and creates meaningful activities and opportunities in which learners can work together and experience success. These meaningful activities are patterns of interaction termed bidirectionality. Bidirectionality is concerned with the ways in which teachers' strategies and behaviours influence the learners, and learners' strategies and behaviours influence their teachers (Cooper & McIntyre, 1994:633). This ties in with the concept of circular communication processes that will be discussed later in this chapter.
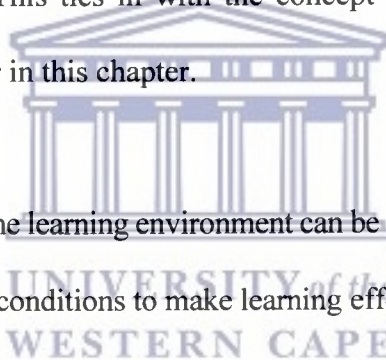
In view of the foregoing arguments, the learning environment can be comprehended as the ability of the teacher to create the necessary conditions to make learning effective within the classroom (Moloi, 1997).

As previously noted, educational environments can be considered as the social-psychological contexts or determinants of learning (Fraser & Walberg, 1991). Teaching in its methodological sense, is a determinant of learning, but it is more explicit than aspects of the learning environment, which point to notions such as classroom climate, tone and ethos etc. Teaching, however, affects the environment and is in turn affected by it. Research on educational environments usually assumes that students, curricula, and other internal and external factors, as well as the teacher, affect the environment (Fraser & Walberg, 1991). Whereas the environment is most often measured by obtaining students' and educators' perceptions of the classroom or

school, research on teaching more often employs behavioural observations and case studies by people other than teachers and students themselves (Fraser & Walberg, 1991).

According to Fraser and Walberg (1991), measures of educational environments are often more like measures of motivation than measures of ability or achievement. They do not require demonstrations of performance but involve judgements of psychological or social-psychological states of classes or schools and often require participant ratings of such things as goal direction, democracy, and satisfaction (Fraser & Walberg, 1991).

A distinctive research tradition examines the correlation of environmental[2] properties with causal antecedents and consequences (Fraser & Walberg, 1991). Such work is typically descriptive, multivariate, and correlational in its quest to study the relations among environmental and other variables as they naturally occur (Fraser & Walberg, 1991:x). The traditional focus of research and evaluation in education has tended to rely heavily and sometimes exclusively on the assessment of academic achievement (examinations) and other valued learning outcomes. In a typical study of teaching, students or classes are assigned to alternative methods of teaching and attempts are made to gauge the relative effectiveness of these teaching methodologies in terms of student outcomes (Fraser & Walberg, 1991). Although few responsible educators would dispute the worth of such outcome measures, they cannot give a complete picture of the educational process. Increasingly we are beginning to experience a shift in emphasis towards examining the important underlying social and psychological aspects of the learning environments of school classrooms (Fraser & Walberg, 1991).

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[2] The term environmental is used here as an abbreviated reference to learning or educational environments.

2.2.2 The Distinction between School and Classroom

When studying educational environments, it is useful to distinguish the classroom or classroom-level environment from the school or school-level environment, which involves psychosocial aspects of the climate of whole schools (Anderson, 1982; Fraser & Rentoul, 1982; Genn, 1984). The classroom thus forms a subset of a broader school educational environment. Both are, however, systemically linked, influencing as well as being influenced by each other.

School climate research owes much in theory, instrumentation, and methodology to earlier work on organisational climate in business contexts (Anderson, 1982). Consequently, one feature of school-level environment research which distinguishes it from classroom-level environment research is that the former has tended to be associated with the field of educational administration and to rest on the assumption that schools can be viewed as formal organisations, whereas the latter specifically concentrates on the psychosocial aspects of the classroom (Fraser & Walberg, 1991).
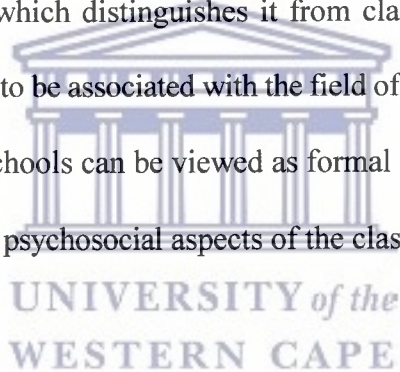
Although educational environments relate to social and psychological aspects of the whole school, this study will focus more exclusively on the classroom and in particular, the aspect of teacher interpersonal behaviour within this learning environment.

2.2.3 Factors affecting the classroom environment

In recent years, there has been an increasing interest in the concept of classroom 'environment,' 'atmosphere,' or 'climate' (Fraser, 1990). According to Wheldall, Beaman and Mok (1999), a number of factors operating at different levels influence the classroom environment. At the school level, differences in classroom environments can be a function of school culture.

Characteristics such as the schools' formal and informal curricula and the values and beliefs fostered by schools all contribute toward defining an atmosphere that distinguishes between schools. In theory, therefore classroom climate is formulated within the context of the culture of the school. At the classroom level, climate may be attributed to the complex processes which exist within teacher and learner interactions. The teacher's professional ideology, teaching experience and teaching style, rapport with learners, as well as the learners' collective level of motivation and expectation all help define the classroom atmosphere. Thus for instance, even two learners in the same classroom may react differently to its atmosphere. Learners bring into the classroom their own different past learning experiences, personalities, and home backgrounds that in turn affect and interact with the experiences of being a learner at school (Wheldall, Beaman & Mok, 1999).
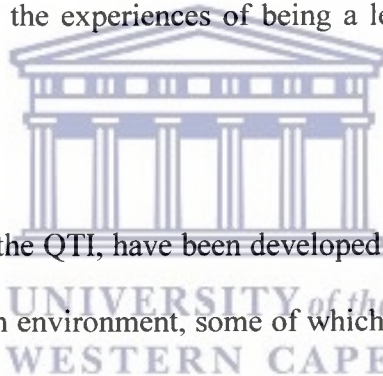
Several instruments, which include the QTI, have been developed to objectively measure and reflect the phenomenon of classroom environment, some of which will be mentioned in more detail later in the chapter. It can be assumed that the factors mentioned above will impact to various degrees on the classroom environment. The QTI which forms the basis of this study, focusses primarily on the teacher, more specifically his/her interpersonal behaviour, as a factor which influences the learning environment.

2.2.4 Research on Learning Environments

Research on learning environments has attracted considerable attention in recent years especially in the international arena (Fraser & Walberg, 1991). I will report on the work of some researchers who have concentrated on this aspect both internationally and in South Africa.

Rudolph Moos cited in Fraser & Walberg (1991), employed a systems model to understand linkages among growth-promoting and stress-inducing features of successive environments during the lifespan. He noted how transcending features of environments, namely, relationships, personal growth, and system maintenance and change, relate to outcome indices such as educational achievement, work performance, and self confidence. Much of this theoretical work helps to place learning environments in context and considers how other factors in the lives of learners and teachers, such as aspects of their family and work settings, affect schools and classrooms (Fraser & Walberg, 1991).

David and Roger Johnson cited in Fraser & Walberg (1991) surveyed over 520 studies conducted over 90 years on the constructive effects of social independence among students. Thus, for instance, cooperative learning was found to raise achievement, interest in the subject matter and contribute to positive social relations (Fraser & Walberg, 1991).
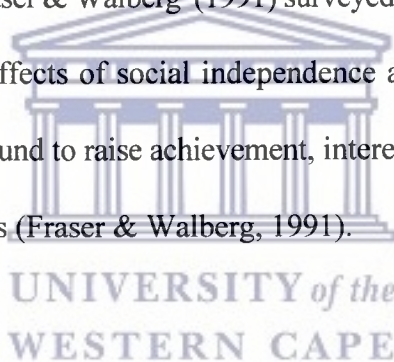
Midgley, Feldlaufer, & Eccles (1989) cited in Fraser & Walberg (1991) were concerned with the decline in academic confidence noted in learners when they moved from generally smaller primary schools to larger, departmentally-organised lower secondary schools. Several of their studies suggest that the decline could be attributable to less positive learner relations with teachers and reduced learner opportunities for decision making in the classroom. In general, their studies have been able to show that moving to a more facilitative environment can have a positive effect on the beliefs and attitudes of young adolescents and impact positively on their learning (Fraser & Walberg, 1991).

Jakubowski and Tobin (1991) showed the importance of teachers' metaphors and beliefs about their teaching roles. They traced teachers' changes in visions of teaching in response to an innovative training program aimed at changing teachers' realist epistemologies to constructivist ones. As teachers were increasingly able to see their roles as facilitators of learning and curriculum designers, their students were found to become more autonomous learners. These findings highlighted the link between teacher cognitions and practices and the milieu in which learning occurs (Fraser & Walberg, 1991).

Research on learning environments has not extensively been investigated in South Africa. A literature search on the internet using the *Sabinet Online* search tool reveals a limited quantity of theses and journal articles. Over the past few years it has received some attention in Education Administration and Organisation modules taught at the Rand Afrikaans University, hence encouraging some research in this field. Two such studies were undertaken by masters students in education at the Rand Afrikaans University.
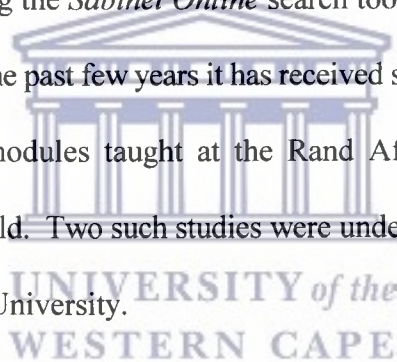
Thus Moloi (1997) aimed to examine how teacher competence, a key factor in organisational effectiveness, can be developed and managed towards school success. Research findings indicated that a conducive classroom climate to learning, learner involvement and consistent support to motivate learners yielded positive learner outcomes.

Another study titled 'Cooperative Learning as an Aspect of the Learning Environment: Implications for the Management of Teacher Competence', by Nhlapo (1997) aimed to provide teachers and managers in the field of education with strategies either to begin to use cooperative learning or improve current uses of this important instructional tool. Findings indicated that

cooperative learning and the management thereof by principals and heads of departments helped to raise the achievement of learners including those with special education needs. It also assisted in building positive relationships between teachers and learners as well as giving students the experience they needed for healthy social, psychological and cognitive development.

2.2.5 Associations Between Student Outcomes and Classroom Environment
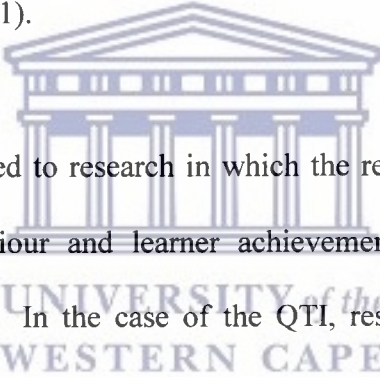
Some classroom environment research has involved the investigation of associations between students' cognitive and affective learning outcomes and their perceptions of pyschosocial characteristics of their classrooms (Haertel, Walberg & Haertel, 1981). Research has shown that student perceptions account for large amounts of variance in learning outcomes, over and above those attributable to background student characteristics (Fraser, 1986; Haertel, Walberg & Haertel, 1981). The practical implication of this research is that student outcomes might be improved by creating classroom environments found to empirically facilitate learning (Fraser & Walberg, 1991).
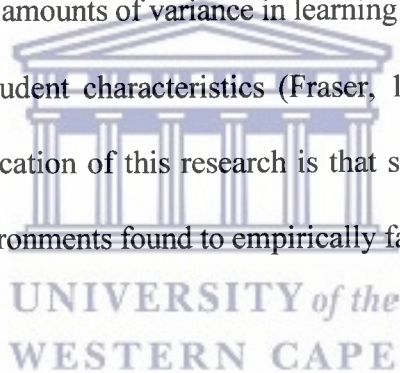
Fraser and Fisher (1982) engaged in a methodologically rigorous study of the effects of classroom environment on student outcomes. The sample consisted of a representative group of 116 grade 8 and 9 science classes, each with a different teacher, in 33 different schools. Three cognitive and six affective measures were administered both at the beginning and end of the same school year, while classroom environment was assessed by administering the Classroom Environment Scale (CES) and the Individualised Classroom Environment Questionnaire (ICEQ) at mid-year. In addition, information was gathered about learner general ability. In order to permit comparison with results from methodologically diverse past studies, data were analysed in six different ways (namely, simple, multiple, and canonical correlation analyses performed separately

for raw post-test scores and residual post-test scores adjusted for corresponding pretest and general ability) (Fraser & Walberg, 1991).

The separate methods of analysis yielded consistent support for the existence of outcome - environment relationships. The study yielded some important tentative implications for educators wishing to enhance learner achievement of particular outcomes by creating classroom environments found empirically to be conducive to achievement. One example of this was that educators were likely to find useful the discovery that Order and Organisation, an environmental dimension accessed by the CES, seemed to have a distinctly positive influence on learner achievement (Fraser & Walberg, 1991).

Similarly, the QTI has been subjected to research in which the relationship between learner perceptions of interpersonal behaviour and learner achievement and attitudes has been investigated (Goh & Fraser, 1996). In the case of the QTI, research has been helpful in identifying the particular teacher behaviour styles (profiles), which are most favourable to learner achievement (Wubbels & Levy, 1993). The predictive validity of the QTI will be discussed in more detail in Chapter 3.

2.2.6 Approaches to Studying Classroom Environments

Fraser & Walberg (1991), cite the three most common approaches to studying classroom environment as being systematic observation, case studies, and assessing student and teacher perceptions. As the focus of this study involves the validation of a paper-and-pencil perceptual measure of teacher interpersonal behaviour by the learners, the QTI, it would be useful to consider some of the advantages of employing such instruments to assess the classroom

environment, rather than classroom observation techniques. Paper-and-pencil perceptual measures are more economical than classroom observation techniques, which involve the expense of trained outside observers. Perceptual measures are based on students' experiences over many lessons, while observational data are usually restricted to a very small number of lessons (Fraser & Walberg, 1991). Another advantage of these measures is that they involve the pooled judgements of all learners in a class, whereas observation techniques typically involve only a single observer. Perceptual measures of classroom environment have been found to account for considerably more variance in student learning outcomes than have directly observed variables (Fraser & Walberg, 1991).

2.2.7 Level of Analysis

In learning environment research, the choice of unit analysis is usually linked to Stern, Stein, and Bloom's (1956) distinction between '*private press*' (the individual view that each person has of the environment) and '*consensual press*' (the shared view that members of a group hold about an environment). Authors such as Goldstein (1987) and Hopkins (1982), acknowledged the importance of choice of unit analysis because measures having the same operational definition can be differently interpreted as a direct result of the varied levels of aggregation attained. Thus relationships using one unit of analysis can differ in magnitude and even in sign from relationships obtained using another unit (Robinson, 1950) and the use of certain units of analysis, (e.g., individuals when classes are the primary sampling units) may seriously compromise the results obtained on statistical significance tests (Peckham, Glass, & Hopkins, 1969). Specifically with regard to studies of associations between learning environment perceptions and students' outcomes, a meta-analysis has shown that associations are stronger in studies using collectivities such as classes or schools (in contrast to individual students) as the

units of analysis (Haertel, Walberg, & Haertel, 1981). In the present study all results are reported for both units of analysis, namely individual learners as well as class means as is the case with similar research conducted abroad.

2.2.8 Examples of Instruments for Assessing the Classroom Environment

Over the past few decades, several instruments have been developed and applied in research to assess perceptions of the classroom learning environment. As the present study has as its focus one instrument (the QTI) for assessing a particular aspect of the learning environment, namely teacher interpersonal behaviour, it will be useful to give the reader a comprehensive account of other scales which have been developed in this field. These instruments have all been designed to evaluate overlapping dimensions of the psycho-social environment within classrooms and are largely administered as paper and pencil perceptual measures of the learning environment. They are used to measure perceptions of both learners and/or educators. The instruments considered here are the *Learning Environment Inventory (LEI)* (Anderson & Walberg, 1974; Fraser, Anderson & Walberg, 1982); *Classroom Environment Scale (CES)* (Fisher & Fraser, 1983; Moos & Trickett, 1987); *Individualised Classroom Environment Questionnaire (ICEQ)* (Rentoul & Fraser, 1979); *My Class Inventory (MCI)* (Fraser, Anderson & Walberg, 1982; Fraser & O'Brien, 1985); *College and University Classroom Environmental Inventory (CUCEI)* (Fraser & Treagust, 1986; Fraser, Treagust & Dennis, 1986); and *Science Laboratory Environment Inventory (SLEI)* (Fraser, Giddings & McRobbie, 1991). Each instrument is suitable for convenient group administration, can be scored either by hand or computer, and has been shown to be reliable in extensive field trials (Fraser & Walberg, 1991)

Table 2.1 (p. 22) shows the name of each scale contained in each instrument, summarises what level (elementary, secondary, higher education) each instrument is suited for, the number of items contained in each scale, and the classification of each scale according to Moos's (1974) classification scheme for classifying human environments. Moos's (1974) scheme distinguished three basic types of dimensions. These are *Relationship Dimensions* (which identify the nature and intensity of personal relationships within the environment and assess the extent to which people are involved in the environment and support and help each other), *Personal Development Dimensions* (which assess basic directions along which personal growth and self-enhancement tend to occur), and *System Maintenance and System Change Dimensions* (which involve the extent to which the environment is orderly, clear in expectations, maintains control, and is responsive to change).
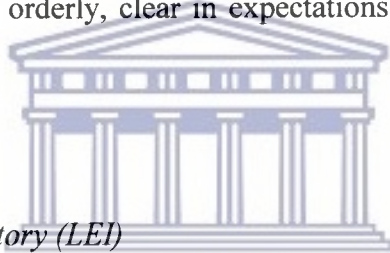
Learning Environment Inventory (LEI)

The initial development and validation of a preliminary version of the LEI began in the late 1960s (Anderson & Walberg, 1974; Fraser, Anderson & Walberg, 1982). The scales included concepts previously identified as good predictors of learning, and considered relevant to social psychological theory and research, concepts similar to those found useful in theory and research in education, or those judged relevant to the social psychology of the classroom. The final version of the LEI contains a total of 105 statements (or seven per scale) descriptive of typical school classes. The respondent expresses degree of agreement or disagreement with each statement on a four-point scale with response alternatives ranging from strongly disagree to strongly agree. A typical item contained in the Cohesiveness Scale: 'All students know each other very well.' An item from the Speed Scale is: 'The pace of the class is rushed' (Fraser & Walberg, 1991).

Classroom Environment Scale (CES)

The CES was developed by Rudolf Moos at Stanford University (Fisher & Fraser, 1983; Moos & Trickett, 1987; Trickett & Moos, 1973) and grew out of a comprehensive program of research involving perceptual measures of a variety of human environments including psychiatric hospitals, prisons, university residences, and work milieus (Moos, 1974). The final published version of the CES contains nine scales with 10 items of True-False response format in each scale. Typical items in the CES are: 'The teacher takes a personal interest in the students' (Teacher Support) and 'There is a clear set of rules for students to follow' (Rule Clarity) (Fraser & Walberg, 1991).

Individualised Classroom Environment Questionnaire (ICEQ)

The ICEQ differs from other classroom environment scales in that it assesses those dimensions (e.g., Personalisation, Participation) which distinguish individualised classrooms from conventional ones. The published version of the ICEQ (Fraser, 1990) contains a total of 50 items, divided equally into five scales. Each item is responded to on a five-point scale with the alternatives ranging from almost never to very often. Typical items are: 'The teacher considers students' feelings' (Personalisation) and 'Different students use different books, equipment, and materials' (Differentiation) (Fraser & Walberg, 1991).

My Class Inventory (MCI)

The LEI has been simplified to form the MCI, which is suitable for children in the 8-to-12 years age range (Fraser, Anderson & Walberg, 1982; Fraser & O'Brien, 1985). Although the MCI was developed originally for use at the elementary school level, it also has been found to be very useful with students in the junior high school, especially those who might experience reading

difficulties with the LEI (Fraser & Walberg, 1991). The final form of the MCI contains a total of 38 items. Typical items are: 'Children are always fighting with each other' (Friction) and 'Children seem to like the class' (Satisfaction) (Fraser & Walberg, 1991).

College and University Classroom Environment Inventory (CUCEI)

This instrument was developed for small higher education classrooms, not lectures or laboratory classes (Fraser & Treagust, 1986; Fraser, Treagust & Dennis, 1986). The CUCEI contains seven seven-item scales. Typical items are: 'Activities in this class are clearly and carefully planned' (Task Orientation) and 'Teaching approaches allow students to proceed at their own pace' (Individualisation) (Fraser & Walberg, 1991).

Science Laboratory Environment Inventory (SLEI)

Because of the critical importance and uniqueness of laboratory settings in science education, a new instrument specifically suited to assessing the environment of science laboratory classes at the senior high school or higher education levels was developed by Fraser, Giddings & McRobbie (1991). The SLEI has five scales that have to be responded to on a five point scale. Typical items include 'Students in this laboratory class get along well as a group' (Student Cohesiveness) and 'We know the results that we are supposed to get before we commence a laboratory activity' (Open-endedness) (Fraser & Walberg, 1991)

Table 2.1 *Overview of scales contained in six classroom environment instruments*
*(**LEI, CES, ICEQ, MCI, CUCEI, and SLEI**)*

Instrument	School Level	Items per scale	Scales classified according to Moos's scheme		
			Relationship dimensions	Personal development dimensions	System maintenance & change dimensions
Learning Environment Inventory (LEI)	Secondary	7	Cohesiveness 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 Competition	Order & Organisation Rule Clarity Teacher Control
Individualised Classroom Environment Questionnaire (ICEQ)	Secondary	10	Personalisation Participation	Independence Investigation	Differentiation
My Class Inventory (MCI)	Elementary	6-9	Cohesiveness Friction Satisfaction	Difficulty Competitiveness	
College and University Classroom Environment Inventory (CUCEI)	Higher Education	7	Personalisation Involvement Student Cohesiveness Satisfaction	Task Orientation	Innovation Individuation
Science Laboratory Environment Inventory (SLEI)	Upper Secondary Higher Education	7	Student Cohesiveness	Open-Endedness Integration	Rule Clarity Material Environment

(Fraser & Walberg, 1991, p.7)

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Extensive validation research, (Fraser, Anderson & Walberg, 1982; Fisher & Fraser, 1983; Fraser & Treagust, 1986; Fraser, Giddings & McRobbie, 1991), on the scales shown in Table 2.1 suggests that the actual form of each scale of each instrument has adequate internal consistency reliability and discriminant validity (although each instrument appears to assess somewhat overlapping aspects). Further analysis also confirmed that each scale in each instrument had the ability to differentiate between classrooms (Fraser & Walberg, 1991).

Some of the above classroom environment instruments namely the ICEQ, MCI and CES have been reduced to shorter forms (Fraser, 1982; Fraser & Fisher, 1983). Usually this has been at the request of teachers using these scales who expressed a desire for instruments that take less time to administer and score (Fraser & Walberg, 1991).

2.2.9 Validation of scales

A summary of a limited amount of statistical information for the six instruments considered previously can be found in Table 2.2. Information is provided about each scale's internal consistency reliability (alpha coefficient) and discriminant validity (using the mean correlation of a scale with the other scales in the same instrument as a convenient index). Generally the data reported in Table 2.2 suggest that the actual form of each scale of each instrument has adequate internal consistency reliability and discriminant validity, although each instrument appears to assess somewhat overlapping aspects (Fraser & Walberg, 1991).

Table 2.2 *Internal consistency (alpha reliability) and discriminant validity (mean correlation of a scale with other scales) for student actual form of six instruments using individual as a unit of analysis*

Scale	Alpha rel.	Mean correl. with other scales	Scale	Alpha rel.	Mean correl. with other scales
Learning Environment Inventory (N = 1048 students)		(N = 149 classes)	**My Class Inventory** (N = 2305 students)		
			Cohesiveness	0.67	0.20
Cohesiveness	0.69	0.14	Friction	0.67	0.26
Diversity	0.54	0.16	Difficulty	0.62	0.14
Formality	0.76	0.18	Satisfaction	0.78	0.23
Speed	0.70	0.17	Competitiveness	0.71	0.10
Material Environment	0.56	0.24			
Friction	0.72	0.36			
Goal Direction	0.85	0.37	**College and University Classroom Environment Inventory** (N = 372 students)		
Favouritism	0.78	0.32			
Difficulty	0.64	0.16			
Apathy	0.82	0.39			
Democracy	0.67	0.34			
Cliqueness	0.65	0.33	Personalisation	0.75	0.46
Satisfaction	0.79	0.39	Involvement	0.70	0.47
Disorganisation	0.82	0.40	Student Cohesiveness	0.90	0.45
Competitiveness	0.78	0.08	Satisfaction	0.88	0.45
			Task Orientation	0.75	0.38
			Innovation	0.81	0.46
			Individualisation	0.78	0.34
Classroom Environment Scale (N = 1083 students)					
Involvement	0.70	0.40	**Science Laboratory Environment Questionnaire** (N = 3727 students)		
Affiliation	0.60	0.24			
Teacher Support	0.72	0.29			
Task Orientation	0.58	0.23			
Competition	0.51	0.09	Student Cohesiveness	0.77	0.34
Order & Organisation	0.75	0.29	Open-Endedness	0.70	0.07
Rule Clarity	0.63	0.29	Integration	0.83	0.37
Teacher Control	0.60	0.16	Rule Clarity	0.75	0.33
Innovation	0.52	0.19	Material Environment	0.75	0.37
Individualised Classroom Environment Questionnaire (N = 1849 students)					
Personalisation					
Participation	0.70	0.28			
Independence	0.70	0.27			
Investigation	0.68	0.07			
Differentiation	0.71	0.21			
	0.76	0.10			

(Fraser & Walberg, 1991, p.12)

The Questionnaire on Teacher Interaction (QTI) used in this study differs from the above instruments in that it aims to investigate perceptions on only one aspect of the educational environment, namely teacher interpersonal behaviour, whereas the other scales tend to focus simultaneously on a number of different dimensions. Teacher interpersonal behaviour constitutes a critical component of the relationship dimension, namely the relationship between teacher and learner within the learning environment. Subsequent research has confirmed the importance of this aspect of the learning environment and has made a valuable contribution to teacher education programmes (Fraser & Walberg, 1991). The QTI, which will be discussed fully in chapter 3, has yielded results indicating similar levels of reliability and validity to those obtained by the instruments listed in Table 2.2 (Wubbels & Levy, 1993).

2.2.10 Practical Applications of Classroom Environment Scales

Classroom environment scales can provide the teacher with valuable feedback information which could inform interventions aimed at improving the learning environment. Thus, for instance, Fraser & Fisher (1986) conducted a study aimed at improving the classroom environment. The study consisted of 22 Grade 9 boys and girls of mixed ability studying science using the short 24-item version of the CES at a government school in Tasmania. They formulated a procedure consisting of five fundamental steps to improve the learning environment viz.:

a) *Assessment.* Questionnaire was administered to all students in the class.

b) *Feedback.* Teacher was provided with feedback information derived from student responses in the form of profiles representing the class means of students' actual and preferred environment scores. These profiles permitted ready identification of the changes needed to reduce major differences between the nature of the

actual environment and the preferred environment as currently perceived by students.

c) *Reflection and discussion.* The teacher engaged in private reflection and informal discussion about the obtained profiles in order to provide a basis for a decision about whether an attempt will be made to change the environment in terms of the identified CES's dimensions. The teacher decided to introduce an intervention aimed at increasing the levels of Teacher Support and Order and Organisation in the class, dimensions which reflected significant discrepancies between actual and preferred environments.

d) *Intervention.* The teacher introduced an intervention of approximately two months' duration in an attempt to change these aspects of the classroom environment. This intervention consisted of a number of strategies, some of which originated during discussions between teachers, and others which were suggested by examining ideas contained in individual CES items. For example, strategies used to enhance Teacher Support involved the teacher moving around the class more to mix with the students, providing assistance to students, and talking to them more than previously. Strategies used to increase Order and Organisation involved taking considerable care with distribution and collection of material during activities and ensuring that students worked more quietly.

e) *Reassessment.* The student actual form of the scales was readministered at the end of the intervention to see whether learners perceived their classroom environments differently than before changes were implemented.

Results indicated appreciable changes in those dimensions (Teacher Support and Task Orientation) in which the teacher had attempted to promote change. Results from the Fraser & Fisher (1986) study employing the above procedure illustrate the potential usefulness of teachers drawing upon classroom environment instruments to provide meaningful feedback information about their classrooms and a tangible basis to guide improvements in classroom environments (Fraser & Walberg, 1991). A study conducted by Fisher & Rickards (1996) using the QTI on science classes also focussed on practical applications of the questionnaire in bringing about change within science classroom environments by applying a similar procedure as the previous study.
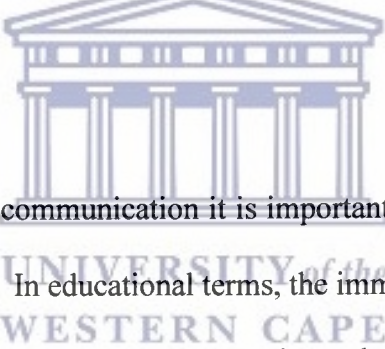
2.2.11 Conclusion

The preceding section gave comprehensive attention to the field of learning environments in education. The phenomena of learning environment was defined and a distinction made between school and classroom levels of this environment. This was followed by an exploration of contemporary research in the area of learning environments especially as they relate to its antecedants and consequences. A focus was also placed on a number of existing paper and pencil measures, which aim to assess the educational environment and have in some way contributed to the development of the QTI forming part of a growing battery of tests of this nature. Data regarding the validation of these scales was also provided, which connects with the core purpose of this particular study, i.e. a validation of the QTI on a South African sample. The section was concluded by some practical applications of classroom environmental scales.

2.3 Approaches to Studying Teacher Behaviour using a Systems Perspective

2.3.1 Introduction

Whereas the previous section concentrated on the various measures and dimensions of the learning environment, the focus from this point on will be the concept of teacher interpersonal behaviour. A theoretical perspective will be given which will help the reader to understand the complex system of human interaction as it occurs within the classroom. This study focusses on teacher interpersonal behaviour, a critical dimension within the classroom learning environment. Teacher interpersonal behaviour essentially involves interpersonal communication occurring between teachers and students inside a classroom. The systems perspective offers us a helpful approach in understanding the dynamics of this relationship and forms the basis of the following discussion (Wubbels & Levy, 1993).

In order to understand interpersonal communication it is important to examine the ecological contextual system in which it occurs. In educational terms, the immediate context for teachers is the classroom. Their natural communication partners are the students. General systems theory can be applied as a basis to analyse classroom communication. Wubbels, Créton and Holvast (1988) demonstrated how systems concepts could be productively used in describing classroom situations as will be discussed in the following sections.

It is important at this stage to introduce two concepts, firstly that of circularity and change, which will help us to understand systems theory and provide a framework for more detailed discussion of classroom communication processes. Circularity and change refer to the interdependent relationship of all aspects in a communication system. This idea leads to the second concept,

which is the focus on teacher behaviour as the most pragmatic point by which to analyse - and change - the learning environment (Wubbels & Levy, 1993).

2.3.2. Circularity and Change

The concepts of circularity and change refer to the interdependent relationship of all aspects in a communication system and are central to an understanding of systems theory, creating a useful basis for describing all other characteristics of teacher-student communication (Wubbels & Levy, 1993). Circularity implies that all aspects of a system are interlinked. Changes in one will not only affect the others, but will in turn be affected by the changes emanating from the other parts of the system (Watzlawick, Beavin & Jackson, 1967). Thus, circular communication processes develop in the classroom which not only *consist* of behaviour but which *determine* behaviour as well. The nature of any system, then, is greatly affected by its response - and in some cases, resistance - to change (Wubbels & Levy, 1993). Thus we find that an enduring pattern of behaviour actions and responses between teacher and learners develops in the classroom which is constantly being reinforced throughout the duration of the communication.

Stability, resistance to change and circular processes characterise all classrooms (Wubbels & Levy, 1993). Teachers seek stability to provide sound instruction, as can be seen in the use of words like "routines" and "rituals" (Au & Kawakami, 1984; Yinger, 1980). These can be quite desirable, in that they help to protect the class from interruption, increase predictability and reduce ambiguity (Shavelson, 1983; Yinger, 1980). They can also be undesirable and not supportive of student achievement. Once stability has been established (whether positive or negative) both teachers and students seem hesitant to change (Blumenfeld & Meece, 1985; Doyle,

1983). The first day of school seems to set the trend for the rest of the year, and once the pattern is set it is difficult to modify (Brooks, 1985).

The presence of circularity can be inferred from Doyle's (1983) analysis of teacher-learner communication as a process of negotiation. He proposes that teacher behaviour in classrooms is probably produced by teacher-learner interaction and is shaped by the demands of securing student cooperation. Since teacher behaviour also *influences* teacher-learner interactions the process is circular. Circularity is a continuous process throughout the communication. People who are communicating continually exchange messages in response to earlier messages, even if there is an interruption of minutes, hours or days. If we haven't seen each other in some time, we simply "pick up where we left off". This makes it impossible to assign a beginning to the communication, unless we consider its entire history. Since communication consists of series of consecutive messages, the teacher's behaviour is therefore, not only *caused* by learners' actions, but also *confirms* them (Wubbels & Levy, 1993).

2.3.3 Focus on Teacher Behaviour

Unique to the systems perspective is its refusal to seek out individual motives to problem situations (Wubbels & Levy, 1993). The notion of circularity and continual communication makes it difficult to identify beginning and endings in teacher-learner interaction. While we may be able to figure out who started what, the information is generally useless for the solution as blaming or pinpointing the "culprit" will not encourage the establishment of an environment conducive to effective problem solving (Wubbels & Levy, 1993). The systems' perspective doesn't attempt to figure out why either, since it doesn't place much importance on the individual motives of participants (Wubbels & Levy, 1993). Teacher-learner relationships are not deduced

from psychosocial backgrounds, but are seen as outcomes of a classroom system in which both teacher and students take part (Wubbels & Levy, 1993). It is my opinion that such an approach is useful in the context of South African classrooms as energy can be diverted away from assigning blame to the teacher or learner, towards creating a more receptive environment in which real problem solving will be possible.

This orientation allows us to deal with problems in the most pragmatic fashion, one which causes the system the least trauma (Wubbels & Levy, 1993). In terms of classroom problems, therefore, it leads to a focus on the teacher's behaviour rather than the learners', since it is easier to change one person instead of forty to fifty, especially when one considers the high teacher-learner ratio's in the current South African context. Campbell (1974) demonstrated the importance of teacher behaviour to class character by analysing classes which stayed together but had different teachers for each subject. The learners were described as varying from "a pack of hungry half-starved wolves with the math and English teachers, to docile lambs with their science teacher" (Wubbels & Levy, 1993:2).

2.3.4 Characteristics of the Classroom Communication System

Closer examination of the classroom communication system is important in developing an understanding of teacher interpersonal behaviour as measured by the QTI. According to Wubbels and Levy (1993), a number of characteristics are revealed in teacher-learner communication. Among these are *punctuation*; *report and command*; *not communicating*; *symmetrical and complementary interaction*; *paradoxical injunctions*; and *meta-communication*. These characteristics will be dealt with in more detail in the following section.

2.3.4.1 Punctuation

Much of the research on undesirable classroom situations views misbehaviour as a learner characteristic and/or as the result of poor management techniques (Doyle, 1986; Wubbels & Levy, 1993). During punctuation, which are the figurative 'full stops or commas' in the communication process, meanings and interpretations are ascribed, which seek to reveal a cause and effect relationship within the communication (Watzlawick, Beavin & Jackson, 1967). People interpret 'punctuations' differently and this naturally leads to differing opinions about which behaviour is cause and which is effect. People in these situations - in our case teachers and learners - may experience 'punctuation problems'. An example would be the teacher whose classroom is noted for its aggressive atmosphere. The teacher feels the learners aren't performing well because of their misbehaviour, and as a result grades them harshly. Learners, on the other hand, feel that their inattention and subsequent low grades come as a result of the teacher's confusing presentations.
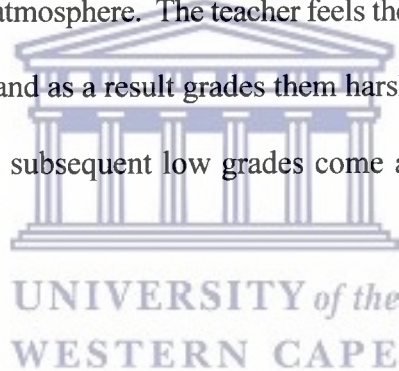
When punctuation problems occur, teachers and learners do not differ as to whether or how certain events took place. They tend to disagree about cause, effect and blame. Most believe it's the other's fault (since he/she/they started it), which is usually an unproductive line of reasoning (Wubbels & Levy, 1993).

2.3.4.2 Report and Command Aspects

Every form of communication also has a '*report* and a *command* aspect' (Watzlawick, Beavin and Jackson, 1967). The 'report' can be understood as the *what*, and the 'command' as the *how* of communication. The report conveys the content, information, or description; the command carries instructions about how to interpret the report (Ruesch & Bateson, 1968 in LaFrance &

Mayo, 1978). In a class, teacher and learners relate in ways which are outside the subject matter (report) and often through non-verbal means (Blumenfeld & Meece, 1985; Stubbs, 1976; Woolfolk & Brooks, 1983). Therefore command-level communication can often be ambiguous and it is important to analyse the nature of these messages. Besides spoken words, the teacher-learner relationship also manifests itself non-verbally through things like bearing, gesture, facial expression, intonation, sound level, articulation and context. When a teacher doesn't consciously think about the 'report and command' aspects of his or her message, learners might react in a way that is different from the teacher's intentions (Wubbels & Levy, 1993). An example of this could be a teacher shouting at a class to keep silent and in the same breath, threatening them with punishment, however in a high pitched voice and his back facing the class. The desired response from the learners was not forthcoming. At the 'report' level the teacher indicated that the learners ought to be afraid of him because of his power to punish them. At the 'command' level, however, learners probably interpreted his high pitched voice as a sign of feebleness or lack of power as well as an inability to face them (Wubbels & Levy, 1993). In analysing problematic communication patterns it is almost always more profitable to concentrate on the 'command' aspects of the interaction rather than the 'report'. 'Command' level aspects of interaction lie chiefly in the non-verbal arena and typically form part of what we communicate unconsciously. Body language has a dominant influence on our interactions and when teachers become more aware of the unconscious messages they are communicating, they are in a better position to solve problematic situations in the classroom.

2.3.4.3 Not Communicating

Less experienced teachers often try to communicate solely on the report level, thereby staying with the subject matter or content areas of the lesson. This may amount to completely ignoring

lack of attention and even misbehaviour on the part of learners in the classroom. Such attempts to avoid command-level interaction is doomed to failure, since it is present in all human communication (Woolfolk & Brooks, 1983). Thus, sending messages at the command level cannot be avoided. Further, every command-level behaviour influences the recipient, even though its meaning isn't explained by the sender. An attempt by the teacher not to communicate may be interpreted by learners as the teacher showing a one-sided interest in his or her subject; a lack of interest in them or as evidence of an inability to talk to learners (Wubbels & Levy, 1993).

2.3.4.4 Symmetrical and Complementary Interaction

Watzlawick, Beavin and Jackson (1967) characterise communication as either symmetrical or complementary. Symmetry implies that the behaviour of one person is followed by the same kind of behaviour in his or her partner. Complementary means that the two are behaving differently, in a more contrary manner. Both are part of the life of a normal classroom (Wubbels & Levy, 1993).

Classrooms are mostly characterised by complementary communication (example: active teacher, passive learners). This is basically due to the different power positions of teacher and learners in the school system. The teacher teaches, assesses and punishes; the learner is taught, is assessed and is punished (Wubbels & Levy, 1993).

Both symmetry and complementary aspects may lead to difficulties. Symmetrical communication may induce escalation especially in conflict situations where both teacher and learners are engaged in oppositional behaviour. Complementary communication can result in intensification

and rigidity, where the more dominant the teacher is, the more passive and less participative the learners become (Wubbels & Levy, 1993).

2.3.4.5 Blindness

Wubbels & Levy (1993), cite the following example to demonstrate a situation in which the teacher seems to be 'blind'.

> Fred often loses himself in the content of the lesson. He lectures most of the time, although his learners also talk a lot. He can often be observed yelling above the din, turned toward the blackboard, oblivious to what is happening behind him. As Fred gets louder, his learners realise they can't hear themselves, and so they speak louder too. This leads to louder and faster teacher talk, less eye contact and greater confusion. It thus becomes more and more difficult for learners who do want to listen, to understand the teacher. Ultimately, only a few learners in front succeed in paying attention and the teacher becomes the only one left interested in the subject (Wubbels & Levy, 1993:9).

In this situation it seems as if the whole class is passing the teacher by. He manages to isolate himself and pretend to be blind and deaf. Such a situation may also occur when learners are working individually. Teachers can also avoid the rest of the class by intensively occupying themselves with one learner. The greater the disorder, the closer they sit to the learner, the louder and longer they talk with him or her and the more they turn their backs to the other learners (Wubbels & Levy, 1993).

Blindness can escalate. The more the teacher turns a blind eye to the disorder, the greater that disorder becomes. In fact, the teacher reacts to the increasing disorder by increasing his or her

blindness. Frequent blindness in a teacher can be dangerous, since the fundamental requirement of instruction is to maintain order (Doyle, 1984; Emmer, Evertson & Anderson, 1980; Evertson & Emmer, 1982; Kounin, 1970; Smith & Geoffrey, 1968;). The primary gain of blindness for the teacher seems to be fear reduction as it allows the teacher to avoid a confrontation with the disorder and with corresponding feelings of helplessness (Wubbels & Levy, 1993). Unfortunately this has negative consequences for the learning environment.

2.3.4.6 Paradoxical Injunction

In a paradoxical injunction, the first party, for instance the teacher, demands behaviour (or makes an injunction), which he or she believes the second (the learner) should do spontaneously. When the second party does not (and cannot) respond spontaneously, the first party reacts negatively. The second party then reacts in a docile, non-spontaneous manner - exactly the opposite of the original intention (Watzlawick, Beavin & Jackson, 1967).
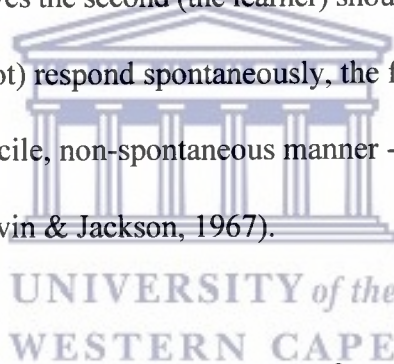
It is not uncommon, for example, for teachers to blame learners for not admiring what the teacher admires: literature, art, etc. The teacher might enforce his or her demands to admire literature, for example, by taking the perceived negative attitudes of the learners' toward literature into account, therefore marking more strictly. The more the teacher demands, the less the learners can respond spontaneously (Wubbels & Levy, 1993).

Learners can also create paradoxical injunctions. For example, they can criticise the teacher for allowing disruptions and urge him or her to be more strict. When the teacher complies it's difficult for him or her to be effective because the learners don't take it seriously, since they were the ones who had set the assignment (Wubbels & Levy, 1993).

2.3.4.7 Metacommunication

An indication of a teacher's flexibility is the ability to engage in metacommunication, which is the practice of critically reflecting, in other words thinking and talking about one's own communication style. Thus, for example, a teacher may realise that the communication patterns are not productive and decide to talk it over with the learners (Wubbels & Levy, 1993). One of the advantages of this approach is a greater clarification of the command aspects of communication as well as strengthening the existing relationship between learners and teacher.

2.3.4.8 Criteria for Healthy Relationships

From the foregoing examples a number of criteria for healthy classroom relationships emerge. Teachers who are communicating in a healthy manner:

1. Send consistent report and command messages.

2. Communicate more in a report than command-based manner.

3. Are flexible; they are open to change their communication patterns.

4. Behave according to what the situation calls for, rather than force a change in the context.

5. Do not exhibit pathological extremes - they seem moderate in their communication style.

6. Agree with their learners about punctuations (beginnings, ends, pauses).

7. Understand how they are being perceived by their learners.

8. Are able to change their communication style through metacommunication - critically reflecting on their own communication.

(Wubbels & Levy, 1993:11)

The systems perspective on communication offers us a language to investigate interpersonal teacher behaviour in more detail. This language enables the researcher to describe the characteristics of the communication processes which take place inside the classroom (Wubbels, Créton & Hooymayers, 1992).

2.4 Conclusion

This chapter attempted to summarise the large body of research in the area of learning environment in its broadest context and gradually narrowing the focus to teacher interpersonal behaviour, which represents one aspect of the learning environment. The issue of terminology was addressed at the beginning of the chapter which then led to a focus on the different instruments used to assess learning environment in the classroom as well as information about their validity. The practical application of these scales was also discussed, which revealed the potential usefulness of these instruments in facilitating a reflective practice amongst teachers. Teacher interpersonal behaviour as revealed in the patterns of interactions taking place in the classroom situation (systems perspective) formed the last part of the discussion in this chapter. The systems perspective forms a very useful framework for understanding the relationship dimension as it is revealed within the classroom from the perspective of teacher interpersonal behaviour.

A foundation has now been laid for a more in depth discussion of the QTI, which is an instrument developed to assess teacher interpersonal behaviour within the classroom. This will be dealt with in chapter three.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter is introduced with a discussion on the aims of the study followed by a comprehensive survey of the Questionnaire on Teacher Interaction (QTI), including its development, theoretical basis, structure and validation studies. The Leary Model of Interpersonal Behaviour (Leary, 1957), which forms the theoretical foundation from which the Questionnaire on Teacher Interaction was developed (Wubbels, Créton & Hooymayers, 1985), will also be discussed. This model also forms the basis for validation of the questionnaire, as statistical analysis will be aimed at measuring to what degree the basic assumptions of the model have been met in the present study. A discussion of the sample and the procedure used for obtaining data during the study will conclude this chapter.
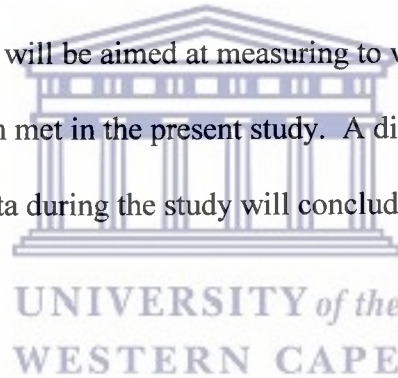
3.2 Aims of the Study

The focus of this research is to validate the elementary version of the Questionnaire on Teacher Interaction (QTI), adapted from the original high school version developed in the Netherlands, on a South African sample. Use of the QTI in overseas contexts has demonstrated its applicability as an effective instrument in determining inset and preset training needs of teachers (Fraser & Walberg, 1991). This study aims to determine the potential usefulness of the QTI as an instrument, in a South African context. Such a validation study can serve as a motivation for the use of this questionnaire in South African schools as well as initiating further research in this field.

3.3 The Questionnaire for Teacher Interaction (QTI)

3.3.1 Introduction

In line with the tradition in learning environment research, interpersonal teacher behaviour is often investigated through the use of learner perceptions (see chapter 2). An instrument to measure secondary learners' and teachers' perceptions of teacher behaviour was developed in The Netherlands in several studies in the early eighties; it is called the *Questionnaire for Teacher Interaction* (QTI) (Wubbels *et al.*, 1985).   After translation from Dutch into English and crossvalidation in the USA (Wubbels & Levy, 1991), the questionnaire was used in various studies in Israel (Kremer-Hayon & Wubbels, 1992) and Australia (Wubbels, 1993). Two earlier versions of the questionnaire for high school learners, namely, the long 64-item version and the short 48-item version, were then adapted to form a short version suitable for use in elementary (primary) schools (Goh & Fraser, 1996). This study focusses on the validation of the latter adapted version of the original questionnaire.
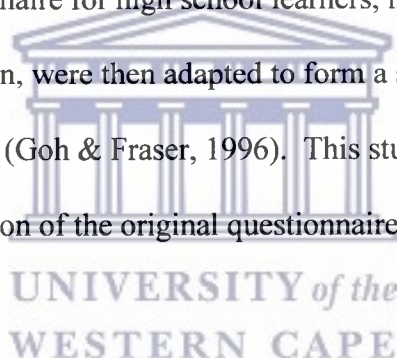
As discussed in chapter 2.3, research on teacher interpersonal behaviour in classrooms is investigated from a systems perspective, following the work done on the conceptualisation of communication processes by Watzlawick, Beavin and Jackson (1967). With the systems perspective in mind, Wubbels, Créton and Hooymayers (1985) developed a framework to map interpersonal teacher behaviour on the basis of a model of Leary (Fraser & Walberg, 1991). This model forms the conceptual and structural basis of the Questionnaire for Teacher Interaction, having been found to fulfil a number of conditions for direct application in educational settings.

Wubbels & Levy (1993:13), formulated a number of criteria which a model mapping teacher interpersonal behaviour had to conform to:

1) Enable educators to observe and analyse interpersonal teacher behaviour.

2) Provide a basis for instrument development to gather data on interpersonal behaviour.

3) Provide a "language" to describe the relationship between learners and teachers.

4) Help educators become aware of the systems communication perspective in the classroom, described in chapter 2. This would enable us to understand the effects which teachers and learners have on each other's behaviour.

5) Facilitate teacher development based on both teaching competencies and personality.

6) Explain the relationship between short-term "molecular" teacher behaviour and long-term communication style.
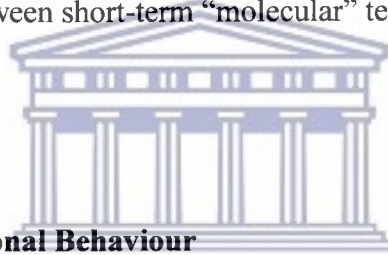
3.3.2 Leary's Model of Interpersonal Behaviour

In 1957 Timothy Leary published his book 'An interpersonal diagnosis of personality' which presented a model for interpersonal behaviour (Leary, 1957). A lot of research throughout the world before and after 1957 corroborated the structure of this model. Since 1980, educational researchers in the United States, The Netherlands and Israel have used this model in educational research and in teacher education (Wubbels, Créton & Hooymayers, 1992).

A product of extended, empirical research in clinical psychology, the Leary model places personality at the heart of interpersonal behaviour (Wubbels & Levy, 1993). Leary believes that the way humans communicate is indicative of their personality. Along with other psychologists, he feels that the most important forces driving human behaviour are the reduction of fear and corresponding maintenance of self-esteem. When people communicate

they therefore consciously or unconsciously choose behaviours which avoid anxiety and allow them to feel good about themselves. These differ for each person and depend upon the personality of the communicating partner. One individual might choose an authoritarian style, whereas another might prefer dependency to achieve the same end. Or, one might act friendly while the other seems unhappy. If successful in avoiding anxiety, people will perform similar behaviours to prolong the effect, thus developing certain patterns of communication (Wubbels & Levy, 1993). Leary, who worked in a psychiatric environment believed that people with the smallest behavioural repertoire - often those who were hospitalised for mental reasons - have the greatest control over their communication. Thus, a man who seems continually angry will cultivate anger in most people he talks with (Wubbels & Levy, 1993).

Leary constructed a model that made it possible to measure both normal and abnormal behaviour on the same scale, and he was therefore able to apply it both inside and outside the clinic. As a result, his instrument has been used not only as a diagnostic tool in psychotherapy but also in the analysis and management of behaviour in other settings (Wubbels & Levy, 1993).

Leary and his co-workers analysed hundreds of patient-therapist dialogues and group discussions in clinical and other situations (Wubbels & Levy, 1993). They then divided the discourse into short statements representing different kinds of interpersonal behaviour. These were then coded and arranged into sixteen categories which, over time, were reduced to eight. These eight can be represented in a two-dimensional plane (Figure 3.1). The two dimensions are labelled Proximity (Cooperation-Opposition) and Influence (Dominance-Submission).

The Proximity dimension designates the degree of cooperation or closeness between those who are communicating. Leary called this continuum the "Affection-Hostility" axis. The Influence dimension indicates who is directing or controlling the communication, and how often. Leary also used the term Dominance-Submission to describe the continuum of behaviours in the Influence dimension (Wubbels & Levy, 1993).

Figure 3.1 *The Coordinate System of the Leary Model*
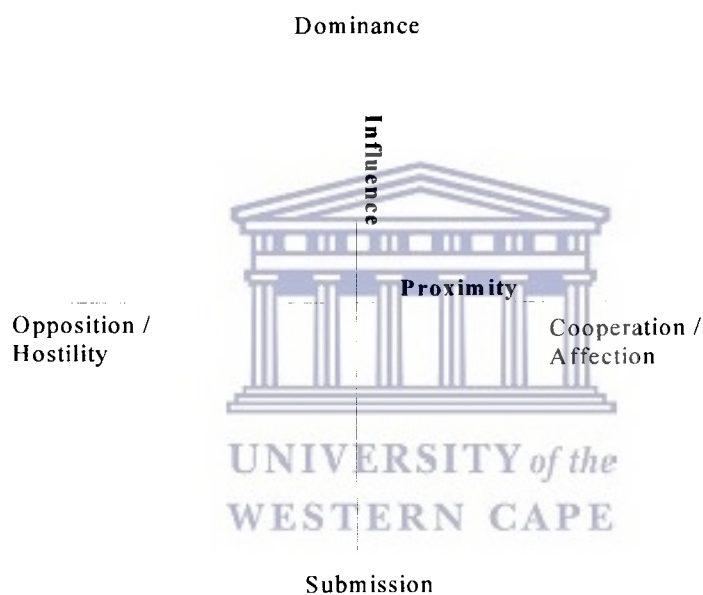
(Wubbels & Levy,1993:15)

The Leary model has held up well under testing in psychological research settings (e.g., Foa, 1961). While the Proximity and Influence dimensions have occasionally been called other names, they have generally been accepted as universal descriptors of human interaction. The two dimensions have also transferred easily to education. Slater (1962) used them to effectively describe pedagogical relationships, and Dunkin and Biddle (1974) demonstrated their importance in teachers' efforts to influence classroom events.

3.3.3 Adaptation of the Leary Model

The Leary model allows for a graphic representation of all human interaction. Thus, for instance, the behaviour of both (or all) parties in a discussion can be recorded on the chart according to how cooperative they are, who is controlling the discussion and to what degree (Wubbels & Levy, 1993).

The following example cited in Wubbels & Levy (1993:16), illustrates the graphing of human interaction. 'The authors of this research are currently communication with you, the reader. They are controlling the communication by presenting information to you. Their behaviour is therefore highly Dominant, since they want you to understand the Leary model, and at the same time they are being highly Cooperative as well. You, on the other hand, must remain silent (for now). Your behaviour can then be termed highly submissive. If you decide that you must speak with the authors and call on the phone, you become more Dominant with each suggestion you provide. If you tell them you love the model you are being Cooperative; if you think they have made a dreadful mistake you become Oppositional.'

In Figure 3.2 we begin to see how the model translates to the classroom. The figure provides examples of the different types of interpersonal behaviours displayed by teachers. The eight equal sectors are labelled DC, CD, etc. according to their position in the coordinate system (much like the directions on a compass). For example, the two sectors DC and CD are both characterised by Dominance and Cooperation. In the DC sector, however the Dominance aspect prevails over the Cooperation aspect. Thus, for example, a teacher displaying DC behaviour might be explaining something to the class, organising groups and making assignments.

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Figure 3.2 *The Model for Interpersonal Teacher Behaviour*
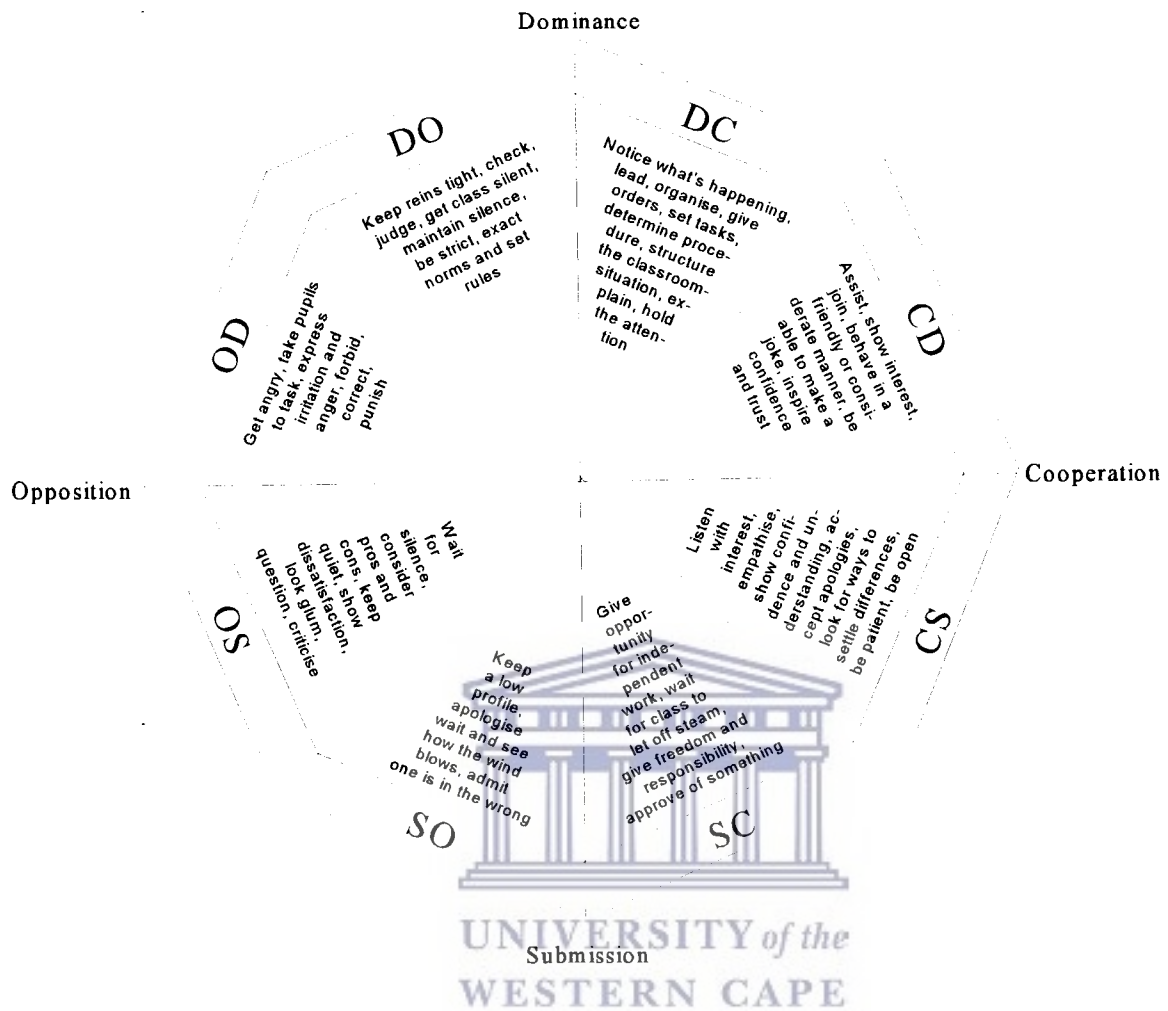
(Wubbels & Levy, 1993:16)

The adjacent CD sector includes behaviours of a more cooperative and less dominant character, and the teacher might be seen assisting learners, or acting friendly or considerate. The sectors of the model describe eight different behaviour aspects: Leadership (DC), Helpful/Friendly (CD), Understanding (CS), Learner Responsibility/Freedom (SC), Uncertain (SO), Dissatisfied (OS), Admonishing (OD) and Strict (DO) (Wubbels & Levy, 1993). These eight criteria form the basis of the QTI, which tries to quantify each of these different aspects

of teacher behaviour in the classroom. The model can also be used to map the behaviour of learners, as can be seen in Figure 3.3.

Figure 3.3 *The Model for Interpersonal Learner Behaviour*
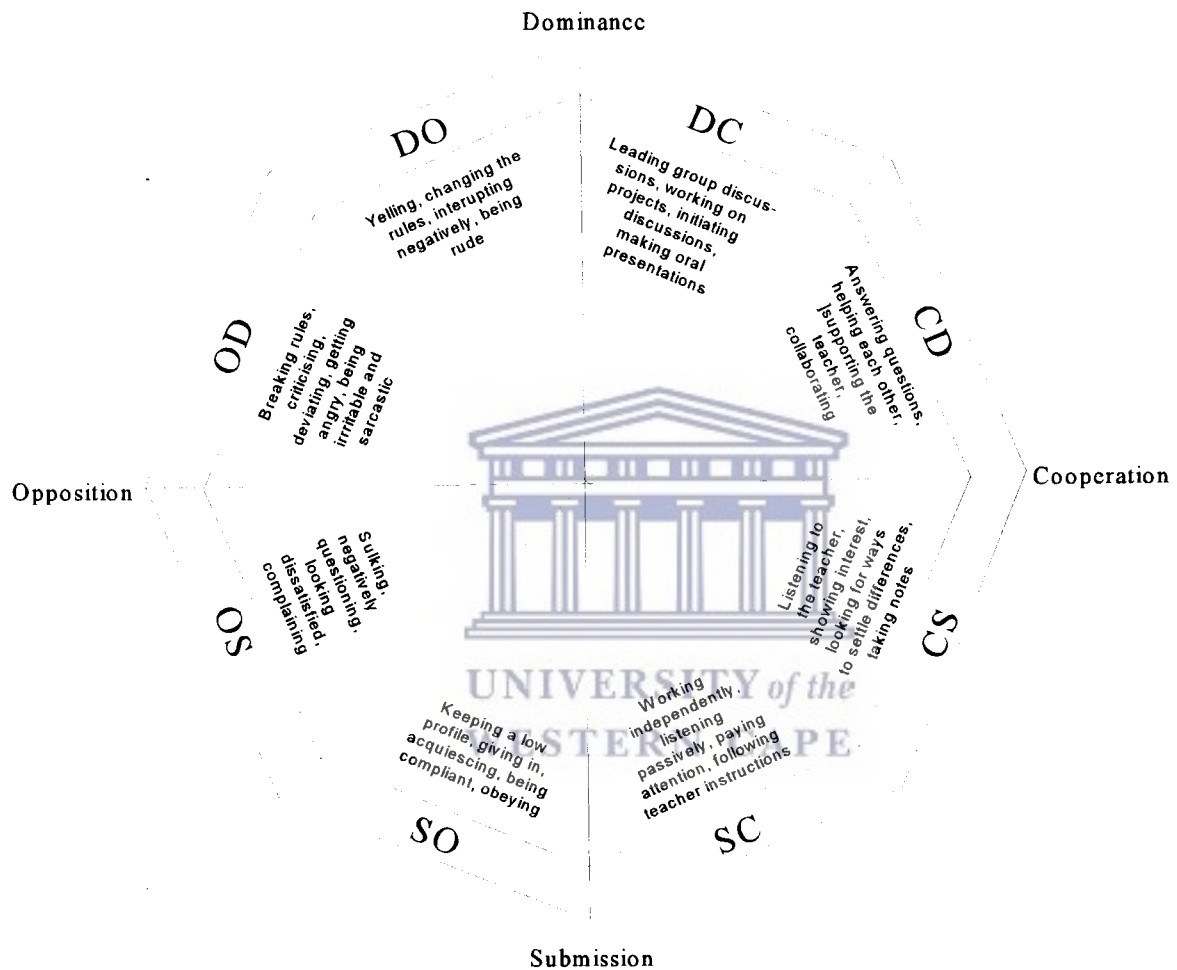
(Wubbels & Levy, 1993:17)

The model can be used as an observational framework to map out classroom behaviour of both teachers and learners during a single lesson. Figure 3.4 describes a lesson in which the teacher was lecturing and in Figure 3.5 the learners were engaged in group work.

One criterion for adopting the Leary model was that it would be able to explain the relationship between short-term 'molecular' teacher behaviour and long-term communication style (Wubbels & Levy, 1993). 'Molecular' behaviours are the descriptive, isolated behaviours

Figure 3.4 *Observational data: Teacher's and Learner's Behaviour for a Lesson in Which the Teacher is Lecturing*

Teacher behaviour   Learner behaviour
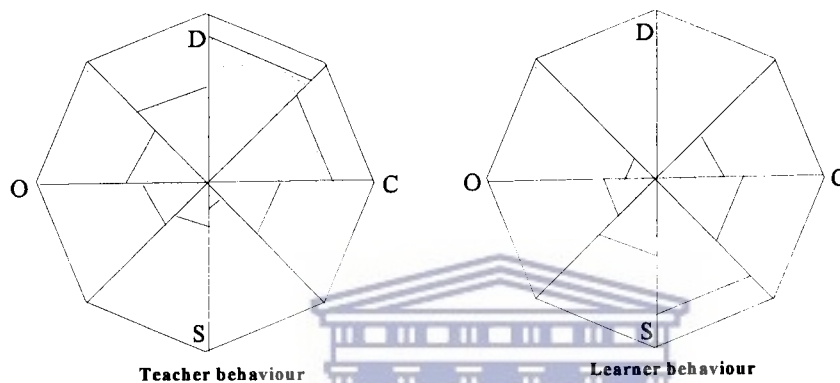
Figure 3.5 *Observational data: Teacher's and Learner's Behaviour for a Lesson in Which Learners are engaged in group work*

Teacher behaviour   Learner behaviour
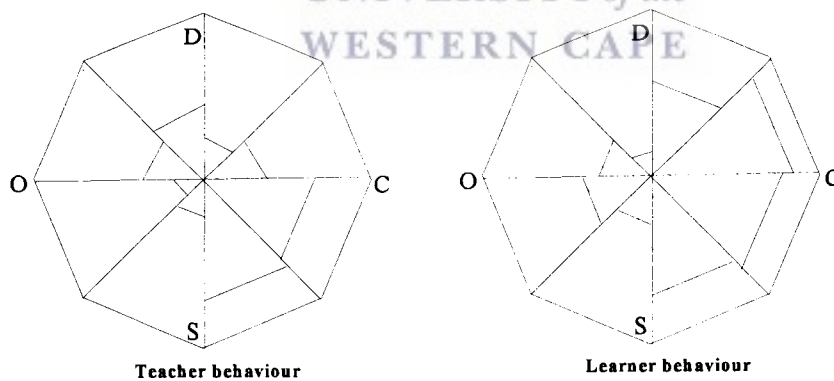
(Wubbels & Levy, 1993:18-19)

which last only a few seconds or minutes, such as explaining a term, calling on a learner to answer, and other similar behaviours (Wubbels & Levy, 1993). As mentioned, people's communication behaviours continually change according to the situation and personalities of those involved. An observation of a lesson using the Leary model would therefore not

describe a teacher's interpersonal style. This could only be established after an observational period which was long enough to discern repetitions, or patterns, of molecular behaviours. Once the observations are repeated frequently over time, the 'molecular' evolves into the 'molar, or extended behaviours which comprise communication style (Wubbels & Levy, 1993:18).

The model by Leary has therefore demonstrated its usefulness for providing an observational framework by which teacher interpersonal behaviour can be mapped in a coherent way. It has formed the basis for the development of several versions of the QTI, initially for use in high schools and then later adapted for primary schools (Brekelmans, 1989: Créton & Wubbels, 1984; Wubbels, Créton & Hooymayers, 1985 and Goh & Fraser, 1996). The next section will focus primarily on the elementary (primary) school version of the questionnaire.

3.3.4 The Elementary School Version of the QTI

Two earlier versions of the questionnaire for high school learners, namely, the long 64-item version and the short 48-item version, were adapted to form a short version suitable for use in primary schools (Goh & Fraser, 1996). This new short form for primary school learners has the same eight scales and contains 48 items, i.e., 6 items per scale, but it differs from the earlier high school version in two main ways. Firstly, some items were modified and reworded into simpler language more suitable for younger learners. For example, 'The teacher takes a personal interest in us' was changed to 'This teacher cares about us,' and 'This teacher realises when we don't understand' was changed to 'This teacher knows when we do not understand.' Secondly, the elementary version has a three-point response format anchored by 'Seldom', 'Sometimes', and 'Most of the Time' in comparison with the five-

point response scale anchored by 'Always' and 'Never' in the high school version (see Appendix 1) (Goh & Fraser, 1996). Appendix 2 gives the reader some descriptive information of the different scales on the QTI. The total score for a particular scale equals the sum of the circled numbers for the six items belonging to that scale. The minimum and maximum scores possible for each scale are 6 and 18, respectively. Appendix 3 shows the eight QTI scales and the items in each scale. Interviews with learners from elementary schools in Singapore generally confirmed learners' understanding of the different response alternatives (Goh & Fraser, 1996).

Once scores for each of the different categories are tallied and averaged for the entire class, the obtained scores can then be transferred to the eight sector model to create a graphical representation or profile of teacher interpersonal behaviour. Appendix 4 outlines the process of scoring and transformation of results into a profile for an individual learner. Each sector is shaded in such a way that the degree of shading is a measure of the height of the scale scores. This produces a visible effect which allows for comparison and easy interpretation of teacher interpersonal behaviour.

3.3.5 Validation of the Questionnaire on Teacher Interaction

Several studies have been conducted on the reliability and validity of the QTI. They have included Dutch (e.g., Créton & Wubbels, 1984; Wubbels, Créton & Hooymayers 1985; Wubbels, Brekelmans & Hermans, 1987; Brekelmans, Wubbels & Créton 1990; Brekelmans, 1989), American (Wubbels & Levy, 1991) and Australian (Fisher, Fraser & Wubbels, 1992) samples. Further studies using the elementary school version of the questionnaire were also conducted on a sample in Singapore (Goh and Fraser, 1996).

Reliability of the questionnaire was gauged by the extent to which each item in a scale measures the same aspect of behaviour for any teacher. For example, do the items on the Leadership (DC) scale refer to a common concept? If so, they can be described as 'homogeneous' or having *internal consistency*. Internal consistency as a statistical measure, will be discussed in more detail in Chapter 4. Table 3.1 presents an overview of the eight QTI-Scales' internal consistencies. At the learner level they mostly greater than 0.70 and at the class level generally above 0.80. While the scores indicate scale homogeneity at both levels, the developers of the instrument recommend limiting usage of the QTI to the class level to ensure credibility (Wubbels & Levy, 1993). Teachers can therefore receive reliable feedback about their interpersonal behaviour on the basis of QTI class means (Wubbels & Levy, 1993).

Table 3.1 *Reliability (Alpha Coefficient) for QTI-Scales on the individual and the class level in American (US), Australian (A), Dutch (D) and Singaporean (S) samples*

	Alpha Reliability Coefficient							
	Learner Level				Class Level			
	US (1606)	A (72)	D (1105)	S (1512)	US (66)	A (46)	D (66)	S (39)
DC Leadership	0.80	0.83	0.83	0.63	0.94	0.94	0.94	0.90
CD Helpful/Friendly	0.88	0.85	0.90	0.78	0.95	0.95	0.95	0.96
CS Understanding	0.88	0.82	0.90	0.65	0.94	0.94	0.96	0.94
SC Learner Responsibility / Freedom	0.76	0.68	0.74	0.58	0.86	0.80	0.85	0.73
SO Uncertain	0.79	0.78	0.79	0.50	0.96	0.92	0.92	0.83
OS Dissatisfied	0.83	0.78	0.86	0.76	0.90	0.93	0.92	0.96
OD Admonishing	0.84	0.80	0.81	0.74	0.92	0.92	0.90	0.93
DO Strict	0.80	0.72	0.78	0.58	0.95	0.90	0.89	0.81

Adapted from Wubbels & Levy, 1993:166 and Goh & Fraser, 1996:519.

The validity of the questionnaire was estimated through structural analysis to establish the levels of convergent and discriminant validity between different sets of scales within the QTI. *Convergent* and *discriminant* validity will be discussed in more detail in chapter 4. This was done by calculating the correlations between scales (Wubbels & Levy, 1993). The Leary model requires the eight scales to be arranged in a circular order in the two-dimensional coordinate system, or graph. In terms of correlations between scales, this means that each scale should correlate highest with the scale next to it (convergent validity). As you move away from a scale the correlations should become lower until they reach the lowest point (highest negative) with the opposite scale (discriminant validity). This is demonstrated by the statistics presented in Table 3.2. Apart from minor irregularities this requirement was met throughout several studies (Créton and Wubbels, 1984).

Factor analysis on class means and confirmatory factor analysis using the LISREL program (Wubbel, Créton, Brekelmans & Hooymayers, 1987; Brekelmans, 1989) determined that the two-factor structure based on the proximity and influence dimensions of the Leary model did indeed support the eight scales of the QTI (Wubbels & Levy, 1993). Brekelmans' (1989) demonstrated that both factors explain 80 percent of the variance on all the scales of the Dutch QTI. Similar results were obtained for the American version (Wubbels and Levy, 1991).

This particular validation study will be limited to determining the internal consistencies of the different scales of the questionnaire and a structural analysis in order to ascertain levels of convergent and discriminant validity between the different scales of the instrument. Chapter 4 will concentrate on results yielded by the present study. These results will be assessed as to

the extent that they demonstrate similarities with research already conducted in this area as revealed in Tables 3.1 and 3.2.

Table 3.2 *QTI Scale Correlations in a Dutch Study using the individual learner as the unit of analysis (Créton and Wubbels, 1984).*

	CD	CS	SC	SO	OS	OD	DO
DC	0.61	0.50	-0.12	-0.72	-0.48	-0.33	0.02
CD		0.86	0.38	-0.34	-0.68	-0.60	-0.42
CS			0.44	-0.23	-0.69	-0.63	-0.49
SC				0.34	-0.24	-0.33	-0.48
SO					0.44	0.29	-0.03
OS						0.76	0.53
OD							0.58

Adapted from Wubbels & Levy, 1993:167.

3.3.6 Learner Achievement and Attitudes

Wubbels and Levy, 1997 analysed the results from three separate studies of 9th grade physics, 5th grade math, and 12th grade biology learners (Brekelmans et al. 1990, Goh 1994, Fisher, Henderson & Fraser, 1995). They found that teacher dominance correlated positively with learner achievement. Strict leadership and helpful/friendly behaviours were positively related to learner achievement (Figure 3.6, p. 53), whereas learner responsibility and freedom and uncertain, dissatisfied behaviours were negatively related. Similarly, the cooperation scales of the model (leadership, helpful/friendly, understanding, and learner responsibility/freedom) were found to be positively related to learner attitudes. The more teachers emphasise these types of behaviours, the more their learners respond positively. In contrast, the opposition

scales (strict, admonishing, dissatisfied, and uncertain) were all found to relate negatively to learner attitudes. Thus, teachers who tend toward the right side and/or below average on the left side of the D-S axis in Figure 3.7 (p.54) are viewed more positively by their learners (Wubbels & Levy, 1997).

These results however, create a dilemma. If teachers want learners to be both high-achieving and supportive, they may find themselves pulling in two directions: strictness correlates well with high achievement, while flexibility relates to positive attitudes. As a result, the dominant teacher who emphasises strictness and leadership gets greater achievement out of a class, whereas his or her learner-orientated counterpart enjoys a better affective atmosphere. It must be remembered however, that an effective teacher's repertoire covers all eight sectors of the model (Wubbels & Levy, 1997). Instructional expertise requires a teacher to employ the most effective communication behaviour called for by the situation. If oppositional behaviour is appropriate at the moment (say a learner is endangering the class), then the effective teacher must behave accordingly. Good teaching requires an interpersonal repertoire that is both broad and flexible (Wubbels & Levy, 1997).

Figure 3.6 *Behaviour profiles of teachers with high and low cognitive outcomes.*

Teacher with low
cognitive outcomes

Teacher with high
cognitive outcomes
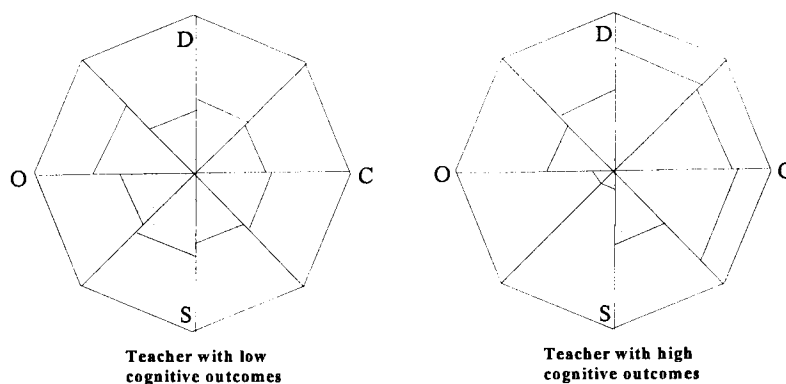
(Fraser & Walberg, 1991, p.155)

Figure 3.7 *Behaviour profiles of teachers with high and low affective outcomes.*

Teacher with low
affective outcomes

Teacher with high
affective outcomes
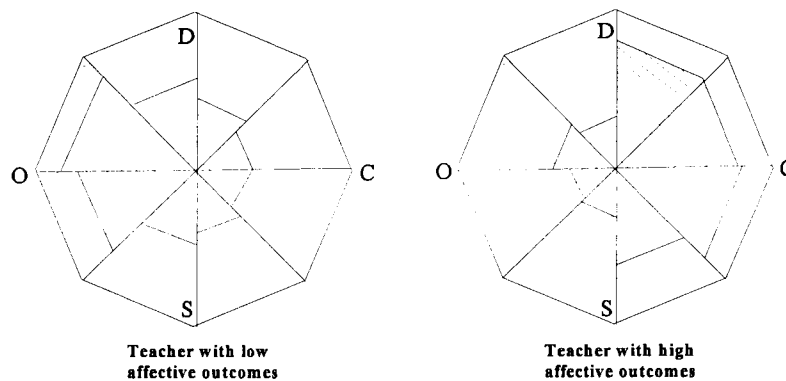
(Fraser & Walberg, 1991:154)

Research has also found that learner perceptions of teacher communication style is a much better predictor of learner achievement than teachers' own perceptions (Brekelmans, 1989). This qualified the assertion of Walberg, (1976) that learners' views mediate the influence of the learning environment on learner achievement. On the basis of these results it was concluded that learners' perceptions of interpersonal teacher behaviour are a better measure of the quality of instruction than teachers' perceptions (Fraser & Walberg, 1991).

These findings clearly have implications for teacher professional development. Teacher education programs, both pre- and inservice, should encourage certain types of teacher behaviours. Research findings show that good teachers are both dominant and cooperative. They should be able to empathise with learners, understand their world, listen to them, while at the same time be able to set standards and maintain control while allowing learners to have responsibility and the freedom to learn (Wubbels & Levy, 1997).

3.4 The Empirical Investigation

This section will concentrate on the sample used in this study as well as the procedure followed while conducting this research.

3.4.1 The Sample

A convenient sample was used in this study consisting of 485 learners from sixteen grade 6 and 7 classes in a random selection of six Mitchells Plain primary schools. The total learner enrolment at the six primary schools was 4936 out of a population of approximately 43000 learners for the entire Mitchells Plain education district. As far as possible grade 6 English classes were used, however, half of the sample were either dual medium or Afrikaans language medium classes (see Table 3.3). Two English medium grade 7 classes were also used to increase the size of the sample. Learners fell in the age range eleven to sixteen years with 81.6% of the sample between 11 and 12 years of age. The sample was more or less evenly split in terms of gender. The medium of instruction was predominantly English and Afrikaans with the majority of learners speaking English and a negligible number of Xhosa first language speakers who represented less than 5% of the sample. About 21 percent of the learners were housed in three dual medium classes with both English and Afrikaans used as the language of instruction. Sixteen teachers were therefore assessed by the instrument (QTI) administered during the study.

Mitchells Plain is a majority working class area forming part of the greater Cape Town metropole. The classes were of mixed ability, but relatively homogenous in that most learners were from the traditionally coloured community. Table 3.3 and 3.4 below gives a comprehensive summary of the sample used in the study.

Table 3.3 *Summary of learner profile used in sample (n=485)*

School	No. of Classes	No. of Learners	Grade		Gender		Language Medium (learner/class numbers)		
			6	7	Male	Female	English	Afrikaans	Dual
1	3	82	3		29	53	53/2		29/1
2	2	73	2		38	35			73/2
3	2	63	2		32	31	34/1	29/1	
4	3	106	2	1	44	62	75/2	31/1	
5	4	125	3	1	60	65	65/2	60/2	
6	2	36	2		20	16	16/1	20/1	
Total	**16**	**485**	**14**	**2**	**223**	**262**	**243/8**	**140/5**	**102/3**

Table 3.4 *Summary of teacher profile used in sample (n=16)*

School	Gender		Grade		Teaching Experience			
	Male	Female	6	7	1-5 yrs	6-10 yrs	11-15 yrs	Over 16yrs
1	1	2	3			1	1	1
2		2	2				1	1
3	1	1	2			1	1	
4	2	1	2	1		2	1	
5	1	3	3	1	1	2		1
6		2	2					2
Total	**5**	**11**	**14**	**2**	**1**	**6**	**4**	**5**

3.4.2 The Procedure

A pilot study was conducted whereby the QTI was administered to nine grade 6 learners from both English and Afrikaans backgrounds. It was intended that the pilot study would provide

valuable information about the extent to which the QTI was understood by the learners in terms of following the instructions for test administration as well as the correct interpretation of the individual items. It was important to ascertain the comprehension levels of especially the learners with English as a second language, as they represented a significant proportion of the ultimate sample. The group interview which followed immediately after the test administration revealed that both English and Afrikaans speaking learners were comfortable with the instructions and reading level of the QTI. It was therefore possible to administer the QTI to the larger sample without having to change any items or instructions.

The Western Cape Education Department was approached to provide authorisation for undertaking the study. Once authorisation was obtained six primary schools out of a total of forty-eight, were selected through an institution called the Mitchells Plain School Clinic, which forms part of the Education Department's Support Services section. These schools formed part of a convenience sample chosen by the researcher who was employed at the school clinic. Contact took place in the form of letters to both the principal and teachers and included a copy of the questionnaire as well as an explanation of the research to be undertaken. Ethical considerations such as guaranteed anonymity for both schools and learners were emphasised in this communication. All the schools approached in this way consented with some teachers expressing a healthy curiosity about the QTI. The questionnaire was administered at the beginning of the third school term, when both learners and teachers had established an enduring relationship. This 'enduring relationship' would consist of the established communication patterns or molar behaviours discussed in the previous chapter. Appointments were made with the schools, and the researcher conducted the administration of the questionnaire with each of the sixteen classes over a period of two

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weeks in order to ensure uniformity. The teachers were not present during the administration of the questionnaire.

The data gathered in this process was computerised and analysed by means of the PC-version of the Statistical Package for the Social Sciences (SPSS) Rel 6.1 Version 8, in order to determine the levels of reliability and validity of the instrument. Statistical analyses and the results obtained will be discussed in greater detail in chapter 4.

3.5 Conclusion

This chapter focussed primarily on the instrument to be evaluated by the research, namely the Questionnaire on Teacher Interaction (QTI). It included a discussion on its development; theoretical basis; structure and validation studies. Of particular importance was the structure of the questionnaire underpinned by the Leary Model. The validation of the instrument to be discussed in chapter 4 will be based upon the extent to which the assumptions underlying this structure are supported by the results obtained in the study. A short discussion on the links between teacher profiles obtained on the QTI and academic achievement should go far in demonstrating the potential benefits that this instrument has in informing preset and inset training of teachers. The chapter was concluded with an account of sampling plan used and the procedure conducted during the study.

The following chapter focuses on the data analyses applied and the results obtained in this study.

CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter outlines the method of data analysis used in this study and discusses issues relating to reliability and validity of instruments. This is followed by a summary and an explanation of the results obtained in the present study. Tables have been used to facilitate ease of reading.

4.2 Validation of Tests

How dependable are tests which purport to measure human traits or behaviours? This question is relevant not only to the QTI, but to all tests in the psychological domain. Certain conditions must be fulfilled before data which we obtain from different types of measuring instruments can by used in practical situations. There are basically two aspects which relate to test validation or 'measurement dependability' (Magnusson, 1967). Firstly, the measuring instrument which is used on a given occasion and for a given purpose does have to measure the trait it is intended to measure (validity). Secondly, the instrument has to give a reliable measurement, so that we will obtain a similar result if we re-administer the test under comparable conditions for the object or individual concerned. Thus, test data should be dependable from two points of view - they should be meaningful and they should be reproducible (Magnusson, 1967). If these conditions are not met, the application of psychometric measures in human settings would be seriously compromised. It is for this reason that we have to investigate empirically the validity and reliability of an instrument. Test validation therefore is a critical aspect of the development of psychometric instruments. A more detailed discussion of reliability and validity will follow, including the type of analysis applied in the present study.

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4.2.1 Reliability Analysis

The concept of reliability refers to the consistency of scores obtained by the same persons when reexamined with the same test on different occasions, or with different sets of equivalent items (Anastasi, 1982). In its most comprehensive sense, test reliability indicates the extent to which individual differences in test scores are attributable to 'true' differences in the characteristics under consideration and the extent to which they are attributable to chance errors. In more precise terms, measures of test reliability make it possible to estimate what proportion of the total variance of test scores is error variance (Anastasi, 1982:102).

The extent of congruence between measurements can be computed by means of correlation methods. The correlation coefficient for the agreement between repeated measurements under similar conditions constitutes the numerical value of the reliability of the data which can be obtained with a given instrument. This correlation coefficient is called the *reliability coefficient* (Magnusson, 1967). It can take values between 0 and 1 but cannot be negative (Magnusson, 1967). For instance, if identical scores are obtained between two successive administrations or on equivalent sets of items for the same instrument, then the correlation coefficient obtained would be 1,0 and one will conclude that the instrument is completely reliable.

A number of different methods are available for estimating reliability. As the intention is not to provide an exhaustive study of this concept, only a few will be mentioned. The most common is probably the *Test-retest method* which involves the administering of the same test twice. Further methods involve the use of *Parallel tests* where two similar tests are constructed and administered within a given time interval. *Split-half methods* comprise the administration of two parallel tests on the same occasion. In all these methods the results are correlated to obtain the

reliability coefficient for the test (Magnusson, 1967). The method of analysis applied in this study is that of estimating the internal consistency of the QTI.

For a test to be internally consistent, the items that cover similar kinds of behaviour or attitudes should get similar answers. When imagining a test which includes questions like 'Do you enjoy going to parties?' and 'Do you dislike social meetings?' People who answer *yes* to the first should reply *no* to the second (Shelley & Cohen, 1986:107). For example, does the questionnaire measure Leadership or Helping/Friendly behaviour in a useful way? Using reliability analysis, one can determine the extent to which the items in the questionnaire are related to each other, and one can get an overall index of the repeatability or internal consistency of the scale as a whole. An important consideration in questionnaire development is that each item in a scale measure the same aspect of behaviour for any teacher. Thus, for example, one would want to establish whether the items on the Helping/Friendly (CD) scale refer to a common concept. If this is the case, then they can be described as being 'homogenous' or having internal consistency (Wubbels & Levy, 1993). The internal consistency of the QTI was gauged by applying the Alpha (Cronbach) model to the raw data (Cronbach, Gleser, Nanda & Rajaratnam, 1972). This is a model of internal consistency, based on the average inter-item correlation for each scale on the questionnaire. In this case, the learners answers within a class can be considered to be repeated measures of the same variable, teacher behaviour. Then the computed Cronbach's alpha reliability coefficient in a class (with the learners treated as items) would represent an index for the degree of agreement between learners about their perceptions of teacher behaviour (Fraser & Walberg, 1991). Coefficients of generally above 0.80 on the class level would confer with the results obtained in overseas studies and signify an acceptable level of internal consistency (Wubbels & Levy, 1993).

What is important is that similar to other published descriptions of certain tests especially in the personality domain (Anastasi, 1982), the QTI is also validated by the method of internal consistency. It is clear that internal consistency correlations are essentially measures of homogeneity. Because it helps to characterise the behaviour domain sampled by the test, the degree of homogeneity of a test has some relevance to its *construct validity*, a concept which will be addressed in more detail in the next section (Anastasi, 1982:146-145).

4.2.2 Validity Analysis

Validity is concerned with *what* the test measures and *how* well it does so (Anastasi, 1982). It is not sufficient for a test to be reliable. So long as we are dealing with reliability, we are not interested in what the test measures, but only in finding whether it gives the same results on repeated measurement. When testing validity, we investigate whether the test whose reliability is known measures what it has been constructed to measure (Magnusson, 1967:123).
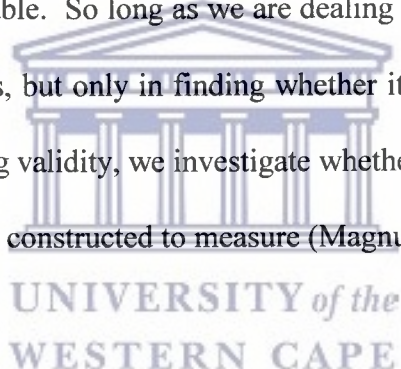
There are generally four different types of validity. *Content validation* refers to a systematic examination of the test content to determine whether it covers a representative sample of the behaviour domain to be measured (Anastasi, 1982:131). *Concurrent validation* is a method applied to assess a test's validity by comparing how subjects do it against their performance on other tests (Shelley & Cohen, 1986). *Predictive validation* is probably the most fundamental in that it is concerned with the degree of the relationship between test performance and other independently observable criterion, i.e., a direct and independent measure of that which the test is designed to predict (Anastasi, 1982). For example, teacher behaviour measured on the QTI against learner academic achievement as the criterion variable.

In this study the primary method applied was that of *construct validation*. The construct validity of a test is the degree to which it can be said to measure a theoretical construct or trait (Anastasi, 1982:144). Intelligence, verbal fluency and anxiety etc. are examples of such constructs. The QTI measures a number of constructs (as represented by the eight scales), which all relate to teacher interpersonal behaviour. These constructs (eg. Strict; Leadership and Helping-Friendly etc.) are arranged systematically to comply with a theoretical model by Leary (1957), which characterises interpersonal behaviour around two axes called influence and proximity (see chapter 3). Theoretically, scales situated at the 'poles' of each axis should share certain characteristic behaviours eg. Leadership and Strict on the Influence dimension. These scales should therefore show positive correlations and hence depict a high level of *convergent validity*. Scales situated at the 'extremes' of each axis should represent opposing sets of behaviours, eg. Understanding and Admonishing on the proximity axis. Thus, when computing the correlations between such scales the resultant coefficients should be negative, therefore depicting a high level of *discriminant validity*. Given the above explanation, one is therefore able to determine the construct validity of the instrument by estimating the levels of convergent and discriminant validity attained by all the scales of the QTI.

The QTI's validity was therefore estimated through structural analysis as explained in the previous paragraph conducted on correlations between scales. The Leary model requires the eight scales to be arranged in a circular order in the two-dimensional coordinate system, or graph (see chapter 3). According to the circumplex model described in Fig. 3.2, scores on adjacent scales such as Helping-Friendly and Understanding, should correlate highest and positively with each other and the magnitude of the correlation should diminish as the scales become increasingly different until they are diametrically opposite to each other. Diametrically opposite

scales, such as Helping-Friendly and Dissatisfied, should have the highest negative correlation (Goh & Fraser, 1996). Given the theory, adjacent scales should have shared behaviour characteristics, however as one moves away this similarity should diminish, as they represent increasingly opposing sets of behaviours.

Scale intercorrelations were computed by using a general correlation coefficient for nonparametric data, namely Spearman's rho (SPSS). Spearman's rho is a nonparametric version of the Pearson's correlation coefficient, based on the ranks of data rather than the actual values. It is appropriate for ordinal data, or for interval data that do not satisfy the assumption of a normal distribution. Values of the coefficient range from -1 to +1. The sign of the coefficient indicates the direction of the relationship, and its absolute value indicates the strength, with larger absolute values indicating stronger relationships (SPSS).

The magnitude and direction of the scale intercorrelations therefore give the researcher an impression of the extent to which these underlying assumptions have been met in the study. As the QTI's structure is based on a model by Leary which conceptualises human interaction on a two-dimensional coordinate system, statistical analysis in this instance would be to estimate the degree of structural validity that could be conferred on the instrument by the present study. For the purposes of this mini-thesis a focus will only be placed on scale intercorrelations as a measure of the instrument's construct validity. In more extensive studies researchers have applied intra-class correlations using Horst's coefficient as well as LISREL analysis to test for the underlying two factor structure supporting the eight scales on the instrument (Fraser & Walberg, 1991). This is, however, beyond the scope of this thesis.

4.3 Reporting of Results in the Present Study

The following results were yielded by subjecting the raw data obtained to the Statistical Package for the Social Sciences (SPSS) in order to determine the levels of reliability and validity of the instrument. The sub-programmes *reliability analysis* (Alpha coefficient), and *bivariate correlation* (Spearman's rho), were used to compute the internal consistency and scale inter-correlation for the QTI. Results have been summarised in tabular form.

4.3.1 Reliability

Cronbach alpha's were computed for each of the subscales separately for individuals (*n=485*) and for classes (*n=16*). The measures are arranged in tabular form with the alpha values indicated next to each of the subscales (see Table 4.1). Thus for leadership, alpha equals 0.56 for individual and 0.84 for the class level of analysis etc.

Table 4.1 reports the Cronbach alpha values obtained for each scale for the primary school sample and shows that reliability is quite good for the class mean score (*n=16*) as the unit of analysis when comparing the results with those obtained in the Singaporean sample (see Table 3.1). Generally overseas studies have reported significant coefficients in excess of 0.70, obtained when using the class means as the unit of analysis. In this study six out of the eight scales, namely Leadership, Helping-Friendly, Understanding, Dissatisfied, Admonishing and Strict, have reliability values of 0.84 and above, with four scales reporting over 0.90 for class means. As can be seen, reliability estimates are higher when the class mean was used as the unit of analysis, which conforms with similar studies reported in Chapter 2 and 3.

Table 4.1 *Internal Consistency Reliability (Cronbach Coefficient Alpha) of different scales for both learner and class level of analysis*

Scale	Cronbach Alpha	
	Individual	Class Means
	n = 485	n = 16
Leadership	.56	.84
Helping / Friendly	.70	.92
Understanding	.64	.91
Learner Resp. / Freedom	.57	.73
Uncertain	.54	.74
Dissatisfied	.70	.93
Admonishing	.73	.95
Strict	.65	.87

4.3.2 Validity

Tables 4.2 and 4.3 report the scale intercorrelations for the QTI firstly using the individual learner and then the class means as unit of analysis. Both tables have scales arranged along a vertical and horizontal axis for easy reading. To facilitate interpretation, correlation coefficients for adjacent scales are shaded in darker grey, while correlations for diametrically opposite scales are shaded in lighter grey. Scales should be read horizontally for Leadership (DC), Helping/Friendly (CD), Understanding (CS), Learner Responsibility/Freedom (SC) and vertically for Uncertain (SO), Dissatisfied (OS), Admonishing (OD) and Strict (DO). The levels of significance are indicated by an asterix.

Table 4.2 *QTI Scale Intercorrelations using the individual learner as the unit of analysis (n=485).*

	DC	CD	CS	SC	SO	OS	OD	DO
Leadership (DC)	1.00	.53**	.51	.23	-.25**	-.37	-.31	-.23**
Helping/Friendly (CD)	.53**	1.00	.54**	.31	-.22	-.52**	-.54	-.37
Understanding (CS)		.54**	1.00	.26**	-.27	-.49	-.48**	-.40
Learner Resp./ Freedom (SC)			.26**	1.00	.11*	-.18	-.18	-.09
Uncertain (SO)				.11*	1.00	.51**	.36	.36
Dissatisfied (OS)					.51**	1.00	.68**	.61
Admonishing (OD)						.68**	1.00	.57**
Strict (DO)							.57**	1.00

*** Correlation is significant at the .01 level**
*** Correlation is significant at the .05 level**

What is clearly noticeable in both tables are the significant positive correlations each scale tends to have with adjacent scales in contrast to the significant negative correlations shared with diametrically opposite scales. In Table 4.3 we have fairly strong positive correlations (ranging from 0.52 to 0.89) between seven out of the eight scales and generally high negative correlations for all of the diametrically opposed scales. However there are two exceptions to the above trend, namely the correlations of 0.11 and -0.16 respectively between the SO and SC scales and especially the negative correlations of -0.23 and -0.78 respectively, between DO and DC. Perhaps the most important aspect is the direction of the correlation, which is the opposite of what should be expected theoretically.

Table 4.3 *QTI Scale Intercorrelations using class means as the unit of analysis (n=16).*

	DC	CD	CS	SC	SO	OS	OD	DO
Leadership (DC)	1.00	.89**	.81	.75	-.33**	-.87	-.89	-.78**
Helping/Friendly (CD)	.89**	1.00	.83**	.78	-.15	-.79**	-.92	-.70
Understanding (CS)		.83**	1.00	.78**	-.16	-.82	-.87**	-.81
Learner Resp./ Freedom (SC)			.78**	1.00	-.16*	-.73	-.85	-.76**
Uncertain (SO)				-.16*	1.00	.52**	.30	.46
Dissatisfied (OS)					.52**	1.00	.83**	.93
Admonishing (OD)						.83**	1.00	.80**
Strict (DO)							.80**	1.00

*** Correlation is significant at the .01 level*
** Correlation is significant at the .05 level*

When viewing the results reported in the Dutch study (see Table 3.2), it appears that this 'irregular' tendency is repeated when specifically looking at the above mentioned scales, albeit not to the same extent as in the present study. In this study the lowest correlations, namely 0.34 (between SC and SO) and statistically insignificant 0.02 (between DC and DO) were recorded for these scales. More discussion relating to these issues will take place in Chapter 5.

Another interesting finding, which ties in with previous research as discussed in Chapter 3, is the affect that the level of analysis, namely the individual learner and the class mean has on the results. Similar to the results on reliability obtained in the present study, the inter-scale correlations were significantly increased when using the class mean as unit of analysis. The

strong values obtained in most of the correlations largely support the findings of similar research conducted on the QTI. Thus there is sufficient evidence of convergent and discriminant validity, which would support the theoretical constructs underpinning the instrument.

4.4 Conclusion

This chapter has focussed primarily on the data obtained in the present study as well as the methodology associated with this data. As such, the concepts of reliability and validity were discussed in more detail. The two measures of validation applied to the QTI were briefly expanded upon, namely internal consistency and convergent/discriminant validity. The results obtained were presented and followed by a brief explanation. Chapter 5 will focus on a discussion of the results obtained. The next chapter will also attempt to show how these results relate to existing theory and research as well as the original objectives of the study.
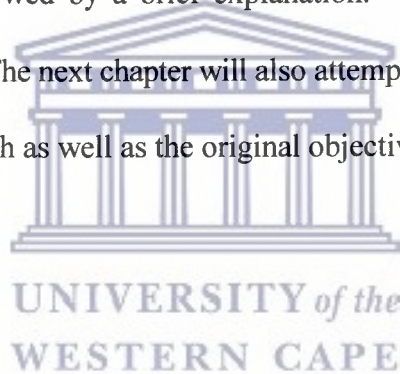
CHAPTER FIVE

DISCUSSION

5.1 Introduction

In this chapter research results obtained from the present study will be discussed in detail. There will also be an elaboration of the links between the present study and previous validation studies as well as theory relating to the QTI. Shortcomings encountered in the present study will also be discussed and the chapter will be concluded with suggestions for future research and practical utilisation of the QTI in the educational setting. Several references will be made to the literature survey as well as figures and tables contained in earlier chapters.

5.2 Discussion of Results

As the intention of the present study is solely to validate the QTI, this discussion will primarily focus on the levels of reliability and validity achieved by means of the statistical analysis applied to the raw data. The statistical concepts of reliability and validity will be dealt with separately and in each instance, the links with theory and previous validation studies will be demonstrated. Where results tend to diverge from previous studies an attempt will be made to explore the possible reasons for these discrepancies.

5.2.1 Reliability

Reliability refers to the degree of consistency of the instrument or the extent to which results obtained are repeatable in subsequent administrations. In the case of the QTI, reliability was ascertained by the degree to which items in each of the subscales correlated with each other. Each of the eight scales on the questionnaire consist of six items. Chapter 4 contained a

discussion about the extent to which each item in a scale measures the same aspect of behaviour for any teacher. This concept which is termed internal consistency (Anastasi, 1982), would ultimately determine the levels of reliability for each of the eight QTI scales. The learners' answers within a class can be considered to be repeated measures of the same variable, teacher behaviour if all the QTI scales are viewed as representing one construct. Cronbach's alpha reliability coefficient in a class (with the learners treated as items) is a measure for the degree of agreement between learners about their perception of the teacher's behaviour. Several studies of the reliability of this questionnaire have been carried out with Dutch, American, Australian and Singaporean samples with results being captured in table 3.1 of this thesis. As indicated, internal consistencies are good. In all the studies, values were well above 0.70 at the learner level and usually above 0.90 at the class level (Fraser & Walberg, 1991).

The present study yielded similar results, especially when compared with the Singaporean sample. This is noteworthy because similar to the the present study, the latter sample was used to validate the elementary version of the QTI. On the learner level of analysis, results of this study were somewhat lower when compared to the Dutch, American and Australian samples. Thus, for example, Cronbach alphas obtained on the Singaporean study ranged from 0.50 to 0.78, whereas the other studies produced much larger values ranging from 0.72 to 0.90. However, when using the class means, a significant improvement is noted with six scales above 0.84 and with four of these scales in excess of 0.90. The present study shares a similar tendency with specifically the Singaporean sample and generally with the other studies. On the individual learner level of analysis, values ranging between 0.54 and 0.73 were obtained as compared to 0.73 and 0.95 when applying the class means. Given the high level of concordance for internal consistency reliability between the present and previous studies, one is in a position to safely

conclude that the QTI can be used to give teachers feedback about their interpersonal behaviour on the basis of class means in the specified South African context.

5.2.2 Validity

Validity refers to the extent to which an instrument actually measures what it intends to. It is the accuracy with which meaningful and relevant measurements can be made with it (Magnusson, (1967). The validity of the questionnaire can to some extent be claimed on the basis of structural analysis, which aims to determine the instruments construct validity. As mentioned in the preceding chapters, structural analysis involves the correlations between the scales of the questionnaire in order to determine the levels of convergent and discriminant validity of the QTI. Convergent and discriminant validity are concepts which relate closely to construct validation. According to the Leary model on which the QTI was structured, the eight scales are arranged circularly in a two dimensional coordinate system. In terms of correlations between scales, this means that, if the Leary model holds, a scale should correlate highest with the scale next to it in the model (see chapter 3). Moving away from the scale around the model, the correlations should become lower, with the highest negative correlation occurring with the scale opposite in the model. In several studies (Créton & Wubbels, 1984; Wubbels, Créton, Brekelmans & Hooymayers, 1987 and Goh & Fraser, 1996), this appears true for every scale, apart from a few minor irregularities.. Table 3.2 in chapter 3 demonstrates this feature of the QTI on a Dutch sample using the individual learner as the unit of analysis.

The tendency illustrated in the above paragraph appears to be reproduced when viewing the results of the present study in tables 4.2 and 4.3, using the shaded blocks as a point of reference. When looking at adjacent scales, six out of the possible eight scales have returned significantly

high positive correlations with generally high negative correlations for all of the diametrically opposite scales. These findings comply very well with similar research on this instrument as articulated in the literature (Goh & Fraser, 1996:519), and would therefore be sufficient to conclude that it has construct validity on the basis of scale intercorrelations. The findings therefore largely support the underlying assumptions as proposed by the Leary model. This would serve to confirm the potential usefulness of the QTI when applied within the present educational setting.

Out of the sixteen possible correlations generated in this way, only two exceptions, namely the low negative correlation (-0.16) between the SO (Uncertain) and SC (Learner Responsibility/Freedom) scales and especially the high negative correlation (-0.78) between DO (Strict) and DC (Leadership) were noted. According to the model, one would expect high positive correlations in both instances. When observing results obtained using the learner as the level of analysis (table 4.2), these discrepancies are less pronounced but generally the correlations are less significant. These 'irregularities' have been reported by several researchers in the field, namely, Créton & Wubbels (1984), as well as Goh & Fraser (1996). In the Dutch study, these tendencies apply to the same subscales, although not to the same extent, as can be seen in table 3.2. As such, the notion is upheld that these discrepancies are insufficient to negate the general tendency of previous as well as present research results in showing acceptable levels of significance for construct validity of the instrument.

Closer examination of the results in the Dutch study as seen in table 3.2 reveal the lowest correlations shared between the same two sets of scales, notable 0.34 between the SO and SC scales and 0.02 between DO and DC, with the exception that they are not negatively correlated

as is the case with the present sample. Although the Dutch study only reflects results on the learner level of analysis, it does seem to suggest a similar pattern being experienced between the two sets of results. It is interesting to note that these diverging tendencies occur exclusively along the proximity axis of the model on the boundary between cooperative and oppositional behaviour (see figure 3.1). This presents a challenge for further research as a number of interesting questions emerge. Is the transition between cooperative and oppositional behaviour adequately captured by the individual items in the respective scales of Strict and Leadership as well as Uncertain and Learner Responsibility / Freedom? Or are these discrepancies perhaps a result of different interpretations of the items by learners as a function of language and culture given the nature and setting of the present sample? These questions are beyond the scope of the present study and can be investigated in future studies..
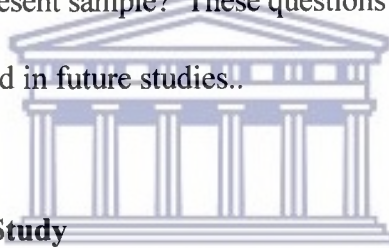
5.3 Shortcomings of the Present Study

A number of limitations can be identified with respect to the present study.

5.3.1 Language

The QTI was administered in English although a significant proportion of the sample (more than thirty percent) were Afrikaans first language speakers. One cannot exclude the possibility that this may have impacted on the results obtained, although Afrikaans speaking learners had demonstrated good comprehension of the test items and instructions in the pilot study .

5.3.2 Representivity of the Present Sample

The sample consisted of a fairly homogenous group located in the Mitchells Plain community. It is by no means representative in terms of race, class, language and culture of the greater Cape Town or the Western Cape for that matter. The question therefore remains whether one can generalise the results obtained in this study to all school communities in the South African context. Further validation studies of a more inclusive nature will be needed in order to generalise the findings to all communities in South Africa.

5.3.3 Use of other forms of Statistical Analysis for Validation

Although beyond the scope of the present study, other forms of analysis could also be applied to the data such as class intra-correlations and confirmatory factor analysis using the LISREL package. Unfortunately the LISREL package was not available to the researcher at the time of undertaking this research. In particular, the LISREL analysis may have delivered results which could provide invaluable support for the arguments raised in favour of the instrument's construct validity.

5.4 Recommendations

These have been categorised with respect to further research in this field as well as practical applications of the QTI in South African educational contexts, based on the results which flow out of the current research.

5.4.1 Further Research

The present study cannot be seen as a complete validation of the QTI, but rather an exploratory one. Despite the promising results obtained for internal consistency as well as convergent and

discriminant validity of the subscales, it is clear that further validation studies are needed. Issues already dealt with in previous sections of this chapter need to be focussed upon, such as the 'irregularities' coming out of the structural analysis, language and the representivity of the sample. However, more extensive studies in this field need to apply confirmatory factor analysis (LISREL), in order to conclusively support the validation of the instrument.

Further studies need to establish the relationship between teacher interpersonal behaviour and learner academic achievement, in order to establish the instrument's criterion or predictive validity, as is the case with overseas research. We need to discover the kind of teacher profiles which correlate well with high learner achievement in the South African context. As such, the ability of the questionnaire to predict learner outcomes will greatly enhance the potential usefulness of the QTI.

5.4.2 Practical Applications of the QTI

The possibility of translating the QTI into Afrikaans and Xhosa should be investigated with respect to its use in the Western Cape. The existing high school version of the questionnaire could be adapted for use in high schools.

Increased use of the QTI in our schools will help to place teacher communication firmly on the agenda in terms of classroom practice. For too long didactic methodology has been held as the only criterion for effective teaching to take place. The introduction of Curriculum 2005 (Cockburn, 1997) has firmly emphasised the shift in classroom practice that needs to take place from being teacher-centred to learner-centred. In the new approach teachers have to play the role of facilitators of learning within the classroom (Cockburn, 1997). The importance of establishing

healthy learning environments can therefore not be over-emphasised in the context of our changing educational landscape. The relationship dimension in the classroom plays an increasingly crucial part of these desired learning environments. Against this background, the QTI can play an invaluable role in the professional development of teachers to enable them to become reflective practitioners. The literature reveals a number of examples for the practical application of the QTI as discussed in previous chapters.

5.5 Conclusion

This chapter initially focussed on a detailed discussion of the results obtained in the present study. It was argued that the results confirmed those obtained in other studies and that the criteria for validation of the instrument were sufficiently met in the present study. This was followed by a discussion on the limitations experienced in the present study. The chapter was concluded by a list of recommendations for further research as well as practical applications of the QTI in the local school system. Chapter 6 will provide a brief summary of the entire thesis and will conclude the findings which have come out of the present study.

CHAPTER SIX

CONCLUSION

It would be appropriate to introduce this concluding chapter by quoting Wubbels and Levy writing in an article titled 'Paying attention to relationships' in Educational Leadership, (1997:85). 'We've tried to describe a different side of effective teachers. In addition to mastering the methodology necessary to design lessons and implement the curriculum, teachers must develop the communicative techniques that establish favourable relationships with learners. Essentially, effective teachers have to be excellent communicators as well as fine technicians. Both sets of skills are therefore equally important. In fact, relationship-building is a prerequisite to a positive classroom climate. Without this piece of the repertoire, teachers cannot fully develop in their practice. The Questionnaire for Teacher Interaction - developed in the Netherlands, the U.S. and Australia - provides a roadmap for professional improvement' (Wubbels & Levy, 1997:84).
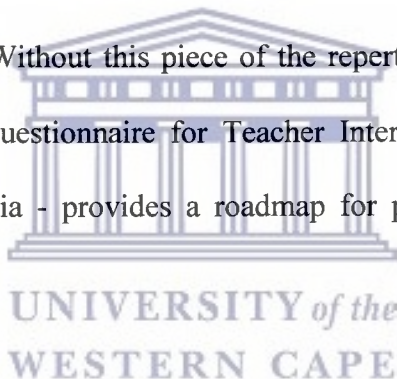
The above paragraph provides a lucid summary of the intentions of the present study. The field of learning environment research has been relatively unexplored in the South African context. This thesis focusses on an important aspect influencing the quality of the learning environment, namely teacher interpersonal behaviour. Given the current transformation of education in South Africa, this research can contribute to supporting initiatives for increasing capacity where it matters most - at the classroom level. The field of learning environment research goes contrary to the current paradigm, which focusses on the technical or methodological aspects of teaching in this country (a teacher-centred approach). Though teaching methodology is important, it is not the ultimate criterion for effective teaching. Research on teacher interpersonal behaviour

enjoys a rich theoretical basis when applying a systems perspective to classroom communication. This has been supplemented by the Leary model of human interaction, which has been successfully applied to educational settings through the development of the QTI. It is argued that learner perceptions inform the nature and quality of the learning environment inside the classroom, a construct which has applied to all environment inventories including the QTI. The QTI can therefore be applied to determine teacher interpersonal effectiveness and provide the necessary insights towards improving classroom practice, essentially furnishing the teacher with a 'roadmap' for professional development.

The findings of the current research generally support and reflect the results obtained in similar studies conducted abroad. One can conclude therefore that these findings provide a sufficient basis for demonstrating the reliability and validity of the instrument in a particular South African context, namely the Mitchells Plain district in Cape Town. It is recommended however that more extensive validation studies on the QTI need to be conducted to provide further support for the current results. This research should make use of other forms of statistical analysis such as intra-class correlations and confirmatory factor analysis using the LISREL package. It may be argued that the instruments convergent and discriminant validity is insufficient for concluding the requirement of having construct validity. Further research should also concentrate on establishing links between teacher interpersonal profiles and student achievement or outcomes (predictive validity) within the S.A. context.

The findings also support the practical application of the QTI in the local educational context. Such an objective measure can be successfully applied by individual teachers or more likely, introduced to schools by education support services personnel of the provincial education

department. Application of the questionnaire can help to encourage a reflective practice by teachers using the results as feedback. It is hoped that this will ultimately facilitate the development of positive learning environments within classrooms as well as contributing to enhanced educational outcomes.

It is hoped that this thesis will make a positive contribution to research on learning environments with specific reference to teacher interpersonal behaviour or classroom communication in South Africa.

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Appendix 1. *Questionnaire on Teacher Interaction (Primary)*

QUESTIONNAIRE ON TEACHER INTERACTION (PRIMARY)
(QTI/Primary)

Directions

This questionnaire is not a test.
We want to know your opinion about how your teacher works with you.
We want you to answer honestly.
Read each sentence carefully.
Show your opinion by circling the number 1, 2 or 3.

SELDOM	SOMETIMES	MOST OF THE TIME
1	2	3

FOR EXAMPLE

	SELDOM	SOMETIMES	MOST OF THE TIME
This teacher has a happy smile.	1	2	3

If you think that your teacher SELDOM has a happy smile, you should <u>circle</u> the number 1.
If you think that your teacher SOMETIMES has a happy smile, you should <u>circle</u> number 2.
If you think that your teacher MOST OF THE TIME has a happy smile, you should <u>circle</u> number 3.

Please answer <u>all</u> the questions. If you want to change your answer, just erase it and shade another bubble.

REMEMBER YOU ARE DESCRIBING YOUR .... TEACHER. CLASS ....

		SELDOM	SOMETIMES	MOST OF THE TIME
1.	We all listen to this teacher.	1	2	3
2.	This teacher is friendly.	1	2	3
3.	This teacher trusts us.	1	2	3
4.	This teacher allows us to work on things that we like.	1	2	3
5.	This teacher doesn't seem sure.	1	2	3
6.	This teacher is unhappy.	1	2	3
7.	This teacher gets angry quickly.	1	2	3
8.	This teacher makes us work hard.	1	2	3
9.	We learn a lot from this teacher.	1	2	3
10.	This teacher likes to laugh.	1	2	3
11.	This teacher knows when we do not understand.	1	2	3
12.	We can decided some things in this teacher's class.	1	2	3
13.	This teacher is not sure of himself/herself.	1	2	3
14.	This teacher is bad-tempered.	1	2	3
15.	This teacher looks down on us.	1	2	3
16.	We have to be quiet in this teacher's class.	1	2	3
17.	This teacher gets our attention.	1	2	3
18.	This teacher's class is pleasant.	1	2	3
19.	This teacher is willing to explain things again if we don't understand.	1	2	3
20.	This teacher gives us a lot of free time in class.	1	2	3
21.	This teacher is shy.	1	2	3
22.	This teacher thinks that we can't do things well.	1	2	3
23.	This teacher makes fun of us.	1	2	3
24.	This teacher's tests are hard.	1	2	3
25.	This teacher knows everything that goes on in this classroom.	1	2	3
26.	We like this teacher.	1	2	3
27.	This teacher takes notice of what we say.	1	2	3
28.	This teacher allows us to choose who we work with.	1	2	3
29.	This teacher is not sure what to do when we fool around.	1	2	3
30.	This teacher thinks we cheat.	1	2	3
31.	This teacher shouts at us.	1	2	3
32.	This teacher is strict when marking our work.	1	2	3
33.	This teacher explains things clearly.	1	2	3
34.	This teacher helps us with our work.	1	2	3
35.	This teacher knows how we feel.	1	2	3
36.	This teacher allows us to fool around in class.	1	2	3
37.	This teacher allows us to tell him/her what to do	1	2	3
38.	This teacher thinks that we know nothing.	1	2	3
39.	It is easy to make this teacher angry.	1	2	3

Appendix 1 *(Continued)*

		SELDOM	SOMETIMES	MOST OF THE TIME
40.	We are afraid of this teacher.	1	2	3
41.	This teacher is sure about what he/she wants to take place in the classroom.	1	2	3
42.	This teacher cares about us.	1	2	3
43.	This teacher listens to us.	1	2	3
44.	This teacher allows us to choose what we want to work on.	1	2	3
45.	This teacher acts as if he/she does not know what to do.	1	2	3
46.	This teacher says that he/she will punish us.	1	2	3
47.	This teacher has a bad temper.	1	2	3
48.	This teacher is strict.	1	2	3

FOR TEACHER'S USE ONLY

Lea............... Hfr............... Und............... Sre............... Unc............... Dis............... Adm............... Str...............

(Goh & Fraser, 1996, page no. unknown)

Appendix 2. *Descriptive Information For Scales of the Questionnaire on Teacher Interaction*

Scale	Description	Sample Item
Leadership	...the teacher provides leadership to the class and holds students' attention	We all listen to this teacher.
Helping / Friendly	...the teacher is friendly and helpful towards students	This teacher is friendly.
Understanding	...the teacher shows understanding/concern/care for students	This teacher trusts us.
Student Responsibility / Freedom	...students are given opportunities to assume responsibility for their own activities	This teacher gives us a lot of free time in class.
Uncertain	...the teacher exhibits his/her uncertainty	This teacher doesn't seem sure.
Dissatisfied	...the teacher shows unhappiness/dissatisfaction with students	This teacher is unhappy.
Admonishing	...the teacher shows anger/temper/impatience in class	This teacher gets angry quickly.
Strict	...the teacher is strict with and demanding of students	This teacher is strict.

(Goh & Fraser, 1996, p. 517)

**Appendix 3.** *The Eight QTI Scales and Items in each scale*

LEADERSHIP

1. We all listen to this teacher.
9. We learn a lot from this teacher.
17. This teacher gets our attention.
25. This teacher knows everything that goes on in this classroom.
33. This teacher explains things clearly.
41. This teacher is sure what he/she wants to take place in the classroom.

HELPING / FRIENDLY

2. This teacher is friendly.
10. This teacher likes to laugh.
18. This teacher's class is pleasant.
26. We like this teacher.
34. This teacher helps us with our work.
42. This teacher cares about us.

UNDERSTANDING

3. This teacher trust us.
11. This teacher knows when we do not understand.
19. This teacher is willing to explain things again if we don't understand.
27. This teacher takes notice of what we say.
35. This teacher knows how we feel.
43. This teacher listens to us.
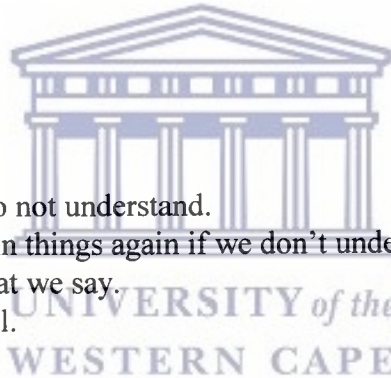
STUDENT RESPONSIBILITY / FREEDOM

4. This teacher allows us to work on things that we like.
12. We can decide some things in this teacher's class.
20. This teacher gives us a lot of free time in class.
28. This teacher allows us to choose who we work with.
36. This teacher allows us to fool around in class.
44. This teacher allows us to choose what we want to work on.

UNCERTAIN

5. This teacher doesn't seem sure.
13. This teacher is not sure of himself/herself.
21. This teacher is shy.
29. This teacher is not sure what to do when we fool around.
37. This teacher allows us to tell him/her what to do.
45. This teacher acts as if he/she does not know what to do.

DISSATISFIED

6. This teacher is unhappy.
14. This teacher is bad-tempered.
22. This teacher thinks that we can't do things well.
30. This teacher thinks we cheat.
38. This teacher thinks that we know nothing.
46. This teacher says that he/she will punish us.

ADMONISHING

7. This teacher gets angry quickly.
15. This teacher looks down on us.
23. This teacher makes fun of us.
31. This teacher shouts at us.
39. It is easy to make this teacher angry.
47. This teacher has a bad temper.

STRICT

8. This teacher makes us work hard in the classroom.
16. We have to be quiet in this teacher's class.
24. This teacher's test are hard.
32. This teacher is strict when marking our work.
40. We are afraid of this teacher.
48. This teacher is strict.

Appendix 4. *Example of Transformation of Results from Appendix 1 into a Profile.*