

SILENCE SPEAKS VOLUMES

by

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ATTESTATION OF AUTHORSHIP

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the qualification of any other degree or diploma of a university or other institution of higher learning, except where due acknowledgement is made in the acknowledgements.

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ABSTRACT

The continuing failure of our education system to meet the needs of minority group students who continue to walk through classroom doors in increasing numbers, provided the initial impetus for this research project. Researchers, academics, and school practitioners need to examine carefully ‘taken for granted’ patterns of talk and behaviour that occur in schools everyday, because for many children, these are not effective.

This study is situated in a mainstream primary school classroom where children from diverse language and cultural backgrounds work and learn together. The importance of the interaction that occurs between teachers and children is discussed and numerous studies which focus on the role of discourse in students’ language learning are critiqued. The fact that students in mainstream primary schools must learn language while using language for content learning, is considered to be of paramount importance, and so discourse that occurred during small group mathematics lessons provided the major source of data for the project.

An aspect of this discourse, language functions of student initiated interactions, was examined in depth. A combination of quantitative and qualitative methods was used to look beyond the surface level of classroom discourse in an attempt to better understand why children interact as they do, or why they remain silent, appearing to be on the periphery of the learning opportunities which are designed to help them to succeed. Classroom observations, and individual interviews provided insights into the complex and competing forces which shape the talk that occurs between students and their teachers.

It was revealed that successful students have effective relationships with teachers, regardless of whether or not they share the same cultural background. These successful students are able to deploy a range of thinking and learning strategies. The importance of making the ‘culture of the classroom’ explicit is highlighted, along with the fact that teachers feel constrained by the demands of an overcrowded curriculum and the need to

address individual learning needs of all of their students. Implications for classroom practice along with teacher training and professional development are proposed.

CHAPTER 1

INTRODUCTION

1.1 Background

Students in mainstream primary school classrooms in New Zealand comprise a very diverse group in terms of the cultural and language backgrounds they represent. Census figures show that between 1991 and 2001 the number of Europeans in New Zealand decreased from 83.2% to 80% of the total population whilst Maori increased from 13% to 14.1%, Pacific Island from 5% to 6.5%, and Asian from 3% to 6% of the total population (Statistics NZ, 2001). Current projections indicate that by 2040, Maori and Pacific Island students will be the largest ethnic groups in New Zealand primary schools (Alton-Lee, 2003).

Much has been written about the achievement gaps in language learning between minority and dominant groups of students (McNaughton, 2002; Te Puni Kokiri, 2004). It is now well documented that Maori and Pacific Island children make “relatively low levels of progress in developing literacy” (McNaughton, 2002:15). Such gaps are not unique to children going to school in New Zealand. Indeed, Cazden (2001) states that the New Zealand pattern is typical of many children from minority ethnic groups in mainstream classrooms in the United States and elsewhere. One indication that our education system is not meeting the needs of each of the four largest ethnic groups mentioned, is the results of the third international mathematics and science study [TIMSS] carried out in 1994. The study, which assessed a total of 4,728 students in years four and five and 3,082 students in years seven and eight, found that the achievement scores of Maori and Pacific Island students were below those of their Asian and European counterparts (Statistics NZ, 2001).

My own observations of some students in classrooms confirmed what these statistics illustrate, in terms of the low achievement of Maori and Pacific Island students. As a teacher working with groups of ESOL [English speakers of other languages] students for short periods of the day in small withdrawal groups, I had the opportunity to work

closely with Pacific Island and Maori students who needed extra support with mathematics – some of the students struggled with the mathematics concepts themselves, some with the language involved, and some with both of these aspects. It was whilst working with these small groups that I became aware of certain behaviours the students were exhibiting to warrant concern. When working in small group instructional situations the students appeared to understand concepts and would seldom ask questions, or request help. Furthermore, when the students were doing independent tasks to practise a skill or concept which had just been taught, they would attempt to complete the work without asking for assistance even if they could clearly not understand what they were supposed to do. The students used a range of strategies to ‘fill in the blanks’ on their worksheet or complete the task set. These strategies included copying someone else, guessing, or applying a pattern of answers unrelated to the actual task. Sometimes the students employed avoidance techniques which many teachers will be familiar with such as sharpening pencils, looking for books, going to the toilet, or talking with friends. The one thing that the students did not do was to request help from the teacher.

When I talked to the teachers from their mainstream classes, they agreed that these students seldom, if ever, requested help. Whilst the majority of the students I was concerned about came from Maori and Pacific Island backgrounds, the teachers of these students were mainly of New Zealand European descent. In 2001 1.7% of teachers identified themselves as Pacific compared with 7.8% of students (Education Review Office, 2002). I began to wonder whether or not cultural differences with teachers could be a factor in levels engagement and subsequent achievement levels for students. It has been suggested that the largely mono-cultural teacher workforce does not have the skill and knowledge to cope with an increasingly diverse student population (Rata, O’Brien, Murray, Mara, Gray, & Rawlinson, 2001). Bishop and Glynn (1999) argue that patterns of domination and subordination between majority and minority cultures in the wider society are reflected in classroom pedagogy in a way that perpetuates the non-participation of Maori students. In 1973 Ranginui Walker claimed that the teaching and learning that was going on in classrooms reflected the Pakeha and mono-cultural frame of reference that was the domain of the large majority of the teachers in schools (Bishop & Glynn, 1999).

1.2 Rationale

Increasingly, relationships between students and their teachers are becoming the focus of research and scrutiny amongst educators (Berryman, Walker, Rewiti, O'Brien, & Weiss, 2000; Hawk, Tumama Cowley, Hill, & Sutherland, 2002). A 'relationship' is defined as "a state of affairs existing between those having relations or dealings" (Allen, 2000). Defined thus, a 'relationship' is not an easy thing to investigate. Many of the things which determine the nature of a relationship are intangible, that is, they are not easy to see or determine. That is because the things that make a relationship good or bad are often feelings between people. As it is sometimes difficult for people to define and describe what makes their *own relationships* good or bad, it would be even more problematic for a researcher to investigate the phenomenon. In order to make it possible to investigate relationships between students and teachers, in particular Maori and Pacific Island students and New Zealand European teachers, it is necessary to focus on a specific feature of those relationships – a feature that can be observed, quantified, analysed and discussed. One such feature, which is readily observable is classroom talk or discourse. As the motivation for this research project was realized during the teaching of mathematics lessons, these provided the context for the discourse for the current project. Further justifications for the choice of mathematics lessons will be revealed in the literature review chapter in due course.

It is probably true to say that talk in classrooms is going on most of the time, and yet it is typically afforded less attention than reading and writing by teachers and researchers (Gibbons, 2002). As already mentioned, anecdotal observations of Maori and Pacific Island students have given rise to a concern that many of these children are not involved in productive classroom talk with teachers, in particular seeking clarification, in order to complete tasks, when they clearly do not know what to do. As already mentioned, this was observed specifically in mathematics lessons, but it is reasonable to suggest that such behaviours are likely to transfer to other areas of the curriculum. Learners' levels of participation in their specific communities of practice [in this case, classrooms] is becoming increasingly recognized as an important factor in their linguistic development (van Dam, 2002). If students are not participating in classroom discourse then it could be that they are not being afforded the opportunities they need to achieve. As stated eloquently by McDermott (cited in Norton & Toohey,

2001:307) “the question of who is learning what and how much is essentially a question of what conversations they are part of.” It is important then, that research focus on the actual classroom discourse, to determine whether or not particular practices facilitate or constrain students’ access to the linguistic resources of their communities (Norton & Toohey, 2001).

1.3 Aims

As all teachers will appreciate, the analysis of the talk that occurs in classrooms, has been and will continue to be a very complex process. One of the reasons such analysis is so complex is because the talk that can be observed is really only the ‘tip of the iceberg’ in terms of what is actually happening in classroom discourse. However, “education’s new emphasis on the ability to communicate [which] requires that classroom interaction change dramatically to foster such ability” (Cazden & Beck, 2003:165) signals the importance of continuing to investigate this area. In order to examine interactions between students and teachers it was necessary to look not only at the actual utterances but also the social and ideological forces with which they are interwoven. For these reasons, a combination of quantitative and qualitative research methods, which will be detailed in the methodology chapter, were used in the study. Classroom observations, combined with individual interviews with teachers and students provided the ‘thick’ description required to provide insights into, and possible explanations for, the discourse patterns which emerged. As Denzin and Lincoln (cited in Richards, 2003:11) established, “qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter.” Richards (2003) reminds us though that we must also use quantitative approaches when they can make valuable contributions to our work.

Alton-Lee (2003:37) asserts that “students need the culture of the classroom explained to them” because the classroom itself is a community with its own unique characteristics. My own anecdotal observations, would suggest that Maori and Pasifika students are among those minority groups who are not capitalizing on learning opportunities, because they are not familiar with the cultural practices of the classroom. The aim of this research project then, was to investigate an aspect of classroom discourse, in order to trace socio-political influences that may facilitate or

constrain certain kinds of teacher and learner participation (Breen, 2001a) particularly when those teachers and learners do not share the same cultural background. It was important to ascertain the extent to which students did understand the 'culture of the classroom' Alton-Lee (2003) talks about and the effect their understandings and beliefs had on the ways in which they participated in classroom discourse.

1.4 Organisation

The literature review follows in chapter two and highlights research and theory which has implications for the current study, from the following areas: minority group achievement in mainstream education; sociocultural theory and classroom discourse analysis; classroom discourse and mathematics; language functions. The specific research questions are presented at the conclusion of the literature review.

In chapter three research methods are outlined and justified in detail. Here it will be revealed that a 'qualitative inquiry approach' (Richards, 2003) was selected as the most appropriate methodology. As will be explained, the 'qualitative inquiry' approach does not preclude the use of quantitative measures, which also contributed to the study.

The findings will be presented in chapter four and these are analysed and discussed in chapter five. Results, some anticipated and others not, will be exposed. These foreground conclusions, implications, and recommendations, presented in chapter six which will not call for radical changes to classroom practice, but should encourage the reader to reflect carefully about their 'taken for granted' beliefs about what is 'best practice'. If education policy makers, teacher educators, school principals, teachers, and researchers can at least allow their thinking to be challenged, and continue to reflect about the decisions they make concerned with teaching and learning, then I believe this study will have served its purpose.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Classroom talk in primary schools enjoys considerably less attention than reading and writing, from both teachers and researchers, and yet it is probably true to say that it is going on most of the time (Gibbons, 2002). It has already been mentioned in the introduction, that the achievement gaps between minority and dominant groups of children in New Zealand mainstream classrooms are glaringly evident, and rather than these disparities being reduced, they continue to widen. As these children come to school every day to participate in classrooms, it is important that teachers and researchers examine critically what is happening with the talk they are engaged in. As Hatch (1978 cited in Breen, 2001b:112) succinctly states: “Language learning evolves out of learning how to carry on conversations.” We need to ask ourselves whether or not the discourse practices which occur in our classrooms maintain and perpetuate the inequality being experienced by students who continue to be over represented in education’s failing statistics. In this country, many of these students are from Pacific Island backgrounds (Education Review Office, 2002).

A major focus of this research project was to determine whether or not the cultural background of teachers and students was a factor in determining the functions of student initiated interactions in small group maths lessons. Therefore, it is appropriate to survey literature concerned with education for minority group children in mainstream classrooms. Both New Zealand and international research will be referred to and within these contexts a discussion of ‘cultural capital’ will provide insights into the language learning opportunities for minority group students.

Classroom discourse analysis based on sociocultural theories of language learning provided the theoretical base for the project. Literature and research from each of these fields will be examined. Studies which have investigated discourse in the context of mathematics teaching and learning will be also be referred to.

Whilst classroom discourse analysis and sociocultural theory provide a ‘wide-angled lens’ through which to view classroom talk, investigating language functions allows a ‘close up’ view of what is going on, and the latter is also afforded consideration in this literature review.

In conclusion, gaps in the literature and research will be reiterated and the specific research questions identified.

2.2 Minority group achievement in mainstream schools

Whilst New Zealand is ranked amongst the top five OECD developed nations in reading for students aged 14 years, we have one of the widest gaps between those who are achieving and those who are not (UNICEF, 2000 cited in Si'ilata, 2004). In a recent paper Hattie lamented the fact that “we have an extreme degree of inequality in our education system” (Hattie, 2003:4). Many of the students in the bottom 20% are Maori and Pacific Island students (Hattie, 2003). This information sadly, comes as no surprise to most people involved in education in New Zealand.

A key piece of local research developed by academics, educators, and researchers from the Woolf Fisher Research Centre, University of Auckland (Phillips, McNaughton, and MacDonald 2002, cited in Keith 2002) which endeavoured to address the achievement gaps referred to is ‘Picking up the Pace’. The research, carried out in South Auckland, included 37 early childhood teachers, 73 primary school teachers, and over 100 children and focused on improving the literacy standards of students transitioning from pre-school to primary school education (Phillips, McNaughton, & MacDonald, 2002). Teachers undertook professional development aimed at improving the literacy standards of their students and the researchers provided evidence which indicated the success of the project. Specifically, children involved in the interventions experienced greater gains in measurable literacy outcomes, than those who were not (Phillips, Mc Naughton, and Mac Donald cited in Keith, 2002). The significance of these gains, the authors claim, is that the work of teachers is more important than home background of the students, in determining progress in literacy (Education Policy Group, 2003). The outcomes have been

afforded significant attention and applauded by the Ministry of Education as ‘ground breaking’. A summary of findings can be found on the Ministry of Education’s website and includes the following:

You can raise levels of literacy achievement in low decile schools. Home and language factors aren’t necessarily associated with children’s low achievement. By the time they were six, the new entrants targeted in this study were reading and writing close to the expected levels achieved by six-year-olds across the country. (Ministry of Education 2003, cited in Harker, 2003:245)

Such claims have nevertheless been subject to scrutiny and some criticism. The Education Policy Group at Massey University (2003) has argued that the findings are unconvincing and misleading because of the way the statistics have been interpreted and reported, and that the gains made by the students were not as marked as the researchers claimed. They assert,

Despite the claims that children in the intervention group score at or close to the ‘average’ level, all the children remained well below the national average on all seven scales used to assess their reading (Education Policy Group 2003:2).

The differing interpretations of the research statistics do not diminish the importance of investigating the performance of Pacific Island students in our classrooms, but represent the complexity of answering questions about how these children learn, and how to best teach them. The rigour with which educators critique one another’s research signals the genuine concern they share for striving to find solutions to complex issues, which for too long have remained unresolved.

Another significant longitudinal study motivated by the researchers’ determination to find solutions to the “now familiar and often reported low academic achievements of Pacific Students in New Zealand schools” (McCaffery et al., 2003:95) was that carried out at Finlayson Park school in Manukau City, just south of Auckland. The study followed the progress of students over a ten year period who were in New Zealand’s first ‘dual medium, dual literacy’ bilingual unit in which both English and Samoan were the mediums of instruction. The unit ‘O le Taiala’, included students from years one to eight, and significant findings included the fact that 100% of the foundation students were reading above their chronological age by the time they had

concluded eight years in the programme. Of the children in year six in the bilingual programme, 71% were reading above their chronological age in English, whilst in the mainstream classes 27% were achieving at a similar level (McCaffery et al., 2003). The authors conclude that the quickest and most effective way for language minority students to gain conceptual and academic knowledge is through using first language based on empowerment models (Baker, 2001; Baker & Prys-Jones, 1998; Corson, 2001; Cummins, 1996, 2000; cited in McCaffery, Tuafuti et al. 2003). Cummins explains that the central tenet of empowerment models is that “students from ‘dominated’ societal groups are ‘empowered’ or ‘disabled’ as a direct result of their interactions with educators in the schools” (Baker & Hornberger, 2001:178). He elaborates saying that empowerment or disempowerment is dependent on the extent to which students’ language and culture is incorporated into programmes, minority community participation is encouraged, pedagogy promotes intrinsic motivation, and professionals involved with assessment advocate for minority students (cited in Baker & Hornberger, 2001). The researchers took a critical approach to classroom discourse, believing that empowerment and disempowerment “...lie at the heart of minority language underachievement” (McCaffery, Tuafuti et al. 2003:83). This critical view of classroom discourse underpinned by Cummins’ empowerment model, was adopted for the current research project in order to better understand the complex nature of student-teacher interactions and their impact on achievement.

The achievement gaps between minority and majority group children which have been described are not unique to children going to school in New Zealand. Cazden (2001) signals that the New Zealand pattern is typical of many children in mainstream classrooms in the United States and elsewhere. Neither is the problem of minority group children being disadvantaged in mainstream education a new one, despite the fact that Norton (2001) indicates resistance and non-participation in second and foreign language classrooms has only *begun* to receive attention in the language education literature. In fact, Vera John, as far back as 1972, talked about the Navajo Indian children in America being “doubly disadvantaged when neither the language of conceptual learning, nor the norm of language use is their own” (Cazden, John, & Hymes, 1972:lii). John observed different learning situations involving Navajo children and concluded that the typical ‘TESL’ [teaching English as a second language] style of teaching of the time which stressed overt verbal performance in

English, was totally foreign and inappropriate for children who approach their learning in a visual manner, with quiet and persistent exploration. Although some of the descriptions of the typical ‘TESL’ teaching may seem rather extreme by today’s standards, for example the “zeal in English instruction resembles that of a missionary bringing the true God to the heathens” (John, 1972:337), the essence of the issues surrounding the failure of minority group students remains the same today, as it was then – “a clash of cultures” (John 1972:332).

A more recent piece of research concerned with the marginalization of minority groups in education, was that of Toohey (2000). A three year study of six children from a Canadian school in a low socio economic area with an ethnically diverse population was carried out with a view to explaining how children’s identities were structured through school and classroom practices. Toohey’s main aim was to “... find ways to take learners’ ‘interactional circumstances’ into account in constructing descriptions and explanations of how they learn second languages” (Toohey 2000:16). A rich and detailed account is provided of how the minority group students’ identities were structured. Among other things, the author believes that “the specific practices of their classrooms ‘produced’ the focal children as specific kinds of students, with the identity ‘ESL learners’ as a more or less important marker” (Toohey 2000:125). Toohey urges researchers to investigate how to teach children to resist the subordination and exclusion from conversations in which they need to be involved.

The research which has been cited thus far, is a ‘drop in the ocean’ of literature available which seeks to address minority group failure in mainstream education, in colonised nations of the developed world. Whilst each researcher, or group of researchers, has sought to explicate specific aspects of language learning, a recurring belief has pervaded the literature:

poor performance in school was a result of the lack of fit between attitudes and behaviour patterns of the children and those required by the school
(Boggs, 1972:303).

It is a sobering thought that the above observations were made as a result of research carried out between 1966 and 1968, almost forty years ago, in two Hawaiian classrooms where the teachers were ‘Caucasian’ and the majority of students Hawaiian. In the research carried out by John (1972) already mentioned above, the

'lack of fit' Boggs talks about is described as 'a clash of cultures'. In 1983, Heath (cited in Lampert, Rittenhouse, & Crumbaugh, 1996:731) proposed that "certain cultural norms privilege some students and disenfranchise others in the performance of traditional school tasks." More recently in New Zealand, Bishop and Glynn have devoted a book to addressing what they describe as 'epistemological racism', "racism that is embedded in fundamental principles of the dominant culture" (Bishop & Glynn, 1999:7). 'Cultural capital', they say, is "where the culture of school matches that of the child" (Bishop & Glynn 1999:139). Nash illuminates the term, cultural capital, as "... the storehouse of experiences, knowledge, and attitudes a child can capitalise on when going to school" (Nash 1993, cited in McNaughton, 2002:21). Researchers to the present day, continue to explore the notion of 'cultural capital'. Si'ilata(2004) explains that children who are familiar with the literacy practices of the school are automatically advantaged over others. She includes specific examples such as "opinion sharing during shared reading: a common 'Pakeha/palagi literacy strategy as opposed to rote memorisation of text: a common Pasifika literacy strategy" (Si'ilata 2004:9).

Clearly, research from at least as far back as the 1960s has revealed that children who come to school with 'cultural capital' which is different to the culture of the classroom perform poorly by academic standards. Despite this, there have been no significant advancements in addressing cultural diversity in mainstream education. Ladson-Billings (1995, cited in Bishop & Glynn 1999) suggests that a 'culturally responsive' approach is required between home and school cultures. A 'culturally responsive' approach is also promoted by Wlodkowski and Ginsberg (1995). They offer a model of culturally responsive teaching which is a "... pedagogy which crosses disciplines and cultures to engage learners while respecting their cultural integrity" (Wlodkowski and Ginsberg 1995:17). One of the aims of this current project was to investigate an aspect of classroom discourse, with a view to offering suggestions for more culturally responsive pedagogy to teachers. Classroom discourse is focus of the next section of the literature review.

2.3 Sociocultural Theory and Classroom Discourse Analysis

Wertsch (1991) pays particular tribute to both Vygotsky [1896-1934] and Bakhtin [1895-1975] when he proposes his approach to endeavouring to understand the human mind. He posits that a sociocultural approach assumes that action is mediated and situated in cultural, historical, and institutional settings (Wertsch 1991). Whilst Wertsch discusses sociocultural theory in terms of how it can contribute to research in the discipline of psychology, he believes that researchers from a range of disciplines can and should work within this theoretical framework. Indeed, researchers in the fields of both Second Language Acquisition and Education frequently use sociocultural theory as a framework for their investigations. For example (Gibbons, 2003:248) positioned her investigation of student-teacher interactions within sociocultural theory because it provided “a means of studying social process involved in situated language learning and use.” It is important to study these social processes because as Auerbach contends, the dynamics of power and domination may be invisible but they permeate the fabric of classroom life (cited in Tollefson, 1995). In other words, Douglas Barnes suggests we must ask: how do we unite the cognitive and the social (cited in Cazden 2001:60)? Others argue the importance of adopting a sociocultural view of language learning, for example Lantolf states,

second language learners advance to higher levels of linguistic knowledge when they collaborate and interact with speakers of the second language, who are more knowledgeable than they are

(cited in Lightbown & Spada, 1999:44).

The collaboration and interaction that Lantolf mentions above can only happen if the second language learner is an active participant in the interaction. Accordingly Miller (2000:70) states,

Linguistic minority students must achieve self-representation in the dominant language if they are to participate in mainstream social and academic contexts.

Donato and McCormick (1994:78) also hold a sociocultural view of language learning describing the language classroom as “a culture with distinctive forms of practice, mediation, and social relations.” Furthermore, they argue, this sociocultural

perspective can provide direction for research on language learning strategies and for the creation of strategic language classrooms. Wertsch (1991:4) also urges researchers to take direction from sociocultural perspectives, suggesting that concrete empirical problems should be investigated in a way that “remains anchored in some more general picture.”

Conducting language learning research from a sociocultural perspective will ensure as Wertsch (1991) suggests, that ‘the bigger picture’ of the classroom, the school, and ultimately society remains clearly ‘in focus’. A way of observing and analyzing what occurs in classrooms, which is underpinned by sociocultural views of language learning is Discourse Analysis. This is described as the study of language in use (Brown & Yule, 1983; Kumaravadivelu, 1999; McCarthy, 1991). McCarthy (1991:7) elaborates by saying:

Discourse analysis has grown into a wide-ranging and heterogeneous discipline which finds its unity in the description of language above the sentence and an interest in the contexts and cultural influences which affect language in use.

When applied to the classroom, discourse analysis can contribute to researchers’ and teachers’ understandings about how children from diverse cultural and ethnic backgrounds learn, because the classroom is the site where the culture and language of the child ‘meets’ the culture and language of the school.

Classroom discourse has become an essential social process by which children need to accomplish both learning and communication goals, and for those born into language communities outside the mainstream, the task of taking on new interactional roles and identities which will enable them to do so, is not an easy one (Cazden & Beck, 2003). When we look at classroom discourse from a sociocultural perspective then, we must look beyond the surface level of communicative performance and examine the “complex and competing world of discourses that exist in the classroom” (Kumaravadivelu, 1999:181). Donato and McCormick (1994) maintain that sociocultural theory perceives social interaction and cultural institutions such as classrooms to have important roles to play in contributing to an individual’s cognitive growth and development. They urge researchers and teachers to view the classroom as “a social arena in which learning is constructed as gradually increasing

participation in the values, beliefs, and behaviours of a ‘community of practice’” (Donato and McCormick 1994:453).

Early studies of classroom discourse carried out by Sinclair and Coulthard (1975, cited in McCarthy 1991) revealed that the most common discourse pattern in classrooms was the IRF [initiation, response, feedback] pattern. What became known as The Birmingham Model, has been very influential in the analysis of discourse (McCarthy 1991). Van Lier (2001), whilst acknowledging that the IRF sequence can be useful for accomplishing some essential aims in the classroom such as checking for understanding, or challenging learners to think, also cautions that the format discourages interruption or disruption so that students’ opportunities to exercise initiative are extremely limited. If teachers consider seriously the fact that pedagogical practices which support students taking control of their own learning effect sustained higher achievement (Walberg 1999, cited in Alton-Lee, 2003), then we must examine whether or not discourse practices are indeed providing the spaces for this to occur. Some studies which illuminate the effects of classroom discourse practices on learner participation will now be described.

In 1985, Marie Clay investigated how five year old new entrant children engaged with school learning tasks, and how the teachers provided for their cultural differences (cited in Cazden, 1990). In six classrooms, all taught by European teachers, two European, two Pacific Island, and two Maori children were observed. Clay and her assistant observed and wrote down the interactions that occurred between the children and their teachers. The study was replicated in 1986 by Kerin for a masters’ thesis (cited in Cazden 1990) and included two Maori and four European teachers. When combining the two studies Cazden (1990) noted that Maori teachers were more likely to ask their children to ‘talk more’ than European teachers, and that European teachers asked their Maori children to ‘talk more’ less often than their European and Pacific Island students. In short, students were experiencing ‘differential treatment’ and it appeared that this was linked to their ethnic background. Obviously, this research highlighted some significant concerns for teachers and researchers. Cazden (1990:300) explains

In any society where groups have differential power, if teachers from the dominant group ‘do what comes naturally,’ the result is apt to advantage children from their own group and disadvantage others.

When she concluded her study, Clay called for “further research that considers cultural differences in communicative styles” (cited in Cazden 1990:297).

Toohy’s (2000) study of young children entering school has already been described, but it is important here to draw parallels with Clay’s findings (cited in Cazden 1990). Toohy examined specific classroom community practices just as Clay did [albeit using different research methods] and also found that students experienced ‘differential treatment’. Although she does not use this specific terminology, the essence of meaning is essentially the same. Rather, Toohy (1998:61) says,

In a stratified community... some students become defined as deficient and are thus systematically excluded from just those practices in which they might otherwise appropriate identities and practices of growing competence and expertise.

In another recent piece of research illuminating the needs of linguistic minority children, Gibbons (1998) looked closely at interactions between nine and ten year old ESL [English second language] students and their teachers, from a mainstream inner city classroom in Sydney, Australia. She concluded that teacher-student interactions played a significant role in facilitating the acquisition of English associated with the curriculum content the students were dealing with. Furthermore, she asserted that the sequence of tasks and the degree of student initiated interactions were important. Gibbons cites other studies as well as her own (for example Ellis, 1984, 1994; Van Lier, 1988, 1996; Hatch, 1992; cited in Gibbons 1998) which highlight the importance of learner as well as teacher contributions to discourse. A further implication from these studies is that classroom programmes must create opportunities for extended opportunities for student talk, and time for these interactions to occur (Gibbons 1998).

Whilst Gibbons (1998) is adamant about the importance of allowing space for talk in the curriculum, it is important to keep in mind how individual learners approach learning tasks. Some studies have found no relationship between overt learner participation and later test attainment (Ely, 1986). Slimani (1989 and 1992 cited in

Slimani 2001) found that low participating and even non-participating students performed well in tests and concluded that they were learning from their high participating colleagues. This study was duplicated by Dobinson (1996, cited in Breen, 2001c) with similar outcomes.

The small sample of discourse studies provided here, signals to both teachers and researchers the importance of examining closely the interaction patterns occurring in classrooms if we are to ensure students are able to be involved in meaningful and relevant dialogues in which they have some autonomy. Cazden and Beck (2003:167) state:

If we want to know whether a classroom situation is encouraging democratic participation by members from a range of social classes or ethnic groups, we must document their participation according to such membership.

2.4 Classroom discourse and mathematics lessons

Second language learners in mainstream New Zealand primary school classrooms do not have the time or the opportunity to concentrate on learning the language of English, before they are immersed in classrooms where they also have to cope with learning curriculum content. These students then, must learn the language at the same time as they are learning through the language. All content areas in the curriculum such as mathematics, art, and science, provide rich contexts for language as well as content learning and so it is vital that teachers maximise opportunities for learning English as well as actual concepts.

Mathematics is one curriculum area where teachers work intensively with small groups of students on a daily basis, talking while introducing new concepts, or revising previously taught material. It is important that students understand what is taught in each lesson because concepts ‘build’ on one another. Cazden and Beck (2003) lament the paucity of discourse analysis research in mathematics lessons and believe that this requires attention because new directions in teaching methods encourage non-traditional structures [ie alternatives to the IRF pattern described earlier]. Discourse in mathematics lessons should require students to “listen to,

respond to, and question the teacher and one another and try to convince themselves and one another of the validity of particular representations, solutions, conjectures, and answers” (National Council of Teachers of Mathematics 1991, cited in Cazden and Beck 2003:174). Applied linguists, Constant Leung and Bill Street, joined forces with mathematics educators at a 2001 mathematics education conference in England because they recognized the importance of the link between mathematics and language (Barwell, Leung, Morgan, & Street, 2002). From their discussions it emerged that the mathematicians frequently viewed language rather simplistically as ‘vocabulary’, whilst the applied linguists predictably held a broader view encompassing things such as the social role of language and language processes (Barwell et al., 2002). They concluded that it was important for maths teachers to reflect on how the social aspect of language impacts on maths teaching and learning and on the provision of opportunities offered to students so that mathematical learning becomes meaningful for them.

The importance of talk in mathematics is also discussed in the New Zealand context:

The introduction of National Certificate of Educational Achievement (NCEA) in New Zealand has reinforced the need for students to be able to explain and justify their results in mathematics... opportunities should be made available for them to talk about their mathematics (Meaney, 2002:1).

The following studies are indicative of some of the research which has examined mathematics learning from a discourse perspective.

In 1994, Black and Huerta (1994) introduced mathematics board games to second grade bilingual students and recorded and classified talk that occurred according to language functions. The researchers found that the use of board games afforded the students many language learning opportunities that they would not have had in the ‘traditional’ teacher fronted maths lessons where the children were required to listen and complete worksheets. They concluded that the use of games in mathematics allowed for “an over-all richness and complexity in children’s talk” (Black & Huerta, 1994).

Lampert, Rittenhouse, and Crumbaugh (1996) use observations from mathematics lessons to discuss what happens when individual students’ beliefs about how learning

should occur, come into conflict with teachers' beliefs about what will foster learning. This research was conducted in a classroom the researchers describe as 'reformed'. Although no actual definition is provided, it can be implied that this was a classroom which was not traditional in the sense that a teacher was not always the person with all the power and knowledge, and that conscious attempts were made to deviate from the traditional IRF pattern of discourse. Disagreements during maths lessons were common place in this classroom and the teacher in fact engineered problems that would lead to discrepancies and then guided students through the discourse required to argue appropriately. The examples of discourse provided for discussion "provide an image of the kind of teaching and learning practices that scholars and reformers currently advocate" (Lampert, Rittenhouse et al. 1996:732). From detailed analyses of maths lesson transcripts, the authors concluded that for the students in this grade five classroom, it was at least as important to maintain social relationships as it was to argue maths. The students did not find it easy to disagree with their peers or their teachers (Lampert, Rittenhouse et al., 1996). The students and the teacher were engaged not only in figuring out the solutions to maths problems, but also in the 'social construction of knowledge' (Lampert, Rittenhouse, et al., 1996). Erickson (1982) explains that teachers and students draw on knowledge of academic task structure and knowledge of social participation structure simultaneously. More recently Breen (2001c:134), describes this 'juggling' of two aspects of discourse eloquently saying that learners "navigate the discourse in two constantly inter-weaving ways; for learning purposes and for social purposes."

Meaney (2002) studied her 13 year old students' oral language use in the mathematics learning context at a Dunedin high school and found that although many students could express their ideas in written form, they were not able to do so through talk. Expecting students to reflect on their problem solving orally seemed to actually restrict the amount of reflection. She concludes that for students in this age group, who are quite comfortable with writing, a combination of speaking and writing could be useful in working through an activity. Meaney cautions that spoken language should not be abandoned in the mathematics classroom but that further research needs to consider the place of both talking and writing during maths lessons. For younger children who are the participants in the current research project, talking may be more important than writing, as their writing skills are not so well developed.

In another piece of research based in New Zealand, this time in two primary schools, Nicky Knight examined teacher feedback to students during mathematics lessons. Teachers, she found, gave very little descriptive feedback – “much of the feedback reflected less on the cognitive aspects of the mathematics learning, and more on the effort and attitude of the learner” (Knight, 2003:43). Teachers said that they felt a lack of time hindered their ability to have quality interactions with students, but Knight also suggested that teachers were not giving descriptive feedback because they were not making the actual learning outcomes of the lessons explicit. She admitted that this research looked at feedback from the teacher to the student, but calls for continued research focussing on encouraging learning dialogue between teachers and students and students.

Black (2004) employed an ethnographic approach to investigate teacher-pupil interactions in a primary school mathematics classroom in a large town in the north-west of England to investigate how wider institutional aspects of context impact the shape and form of the interactions pupils experience. Over a five month period she carried out participant observation and was involved in maths lessons two mornings per week. Data was collected using a video camera and radio microphones attached to randomly selected pupils. The teacher was also interviewed. Black concluded that classroom learning was not so much about acquiring ‘knowledge bytes’ as it is about learning how to behave appropriately, ‘read’ the lesson, and use the right kind of language (Black 2004). Classroom talk, she asserted, was part of a complex process of structural positioning.

The studies which have been described above in this section have all investigated different aspects of discourse during mathematics lessons. Each of the authors acknowledges the significance of discourse practices on the effectiveness of teaching and learning. With the exception of Black and Huerta (1994), none of these studies has examined mathematics discourse from a second language learning perspective. Lampert and Rittenhouse et al. (1996) have taken a sociocultural perspective of language use in their study but there appears to be a paucity of similar studies. Cazden and Beck (2003) suggest that recent research in mathematics education has been done by people with an interest in maths itself, rather than by sociologists with

an interest in the communicative process. They highlight additional gaps in this area admitting that they have been unable to find examples of research in non-traditional mathematics lessons where alternative patterns of discourse have been coded and quantified (Cazden and Beck 2003). A focus on language functions is one way that such discourse patterns can be coded and quantified. A brief look at how language functions have been used to illuminate understandings about second language acquisition will comprise the final section of the literature review.

2.5 Language Functions

Whilst sociocultural theory provides a useful framework for studying classroom discourse as a ‘whole’ or from a macro-perspective, a functional approach is useful in analysing language from a micro-perspective. Brumfit and Finocchiaro (1983) argue that all speech acts are functionally organized because each fulfils a particular communicative purpose. They believe that the ability to use real, appropriate language to communicate and interact with others should be the primary goal of foreign language teaching. Studies in second language acquisition have drawn on classroom functions of language since Sinclair and Coulthard’s (1975, cited in McCarthy, 1991) influential research, which has already been mentioned.

One such study was carried out by Politzer, Ramirez and Lewis (1981) with the purpose of identifying the distribution of classroom discourse functions and examining the use of Vernacular Black English of third grade children in Stanford, USA. They found that the function of replying made up over 90% of the children’s utterances. This finding confirmed those of previous studies such as Bellack et al. (1966, cited in Politzer, Ramirez et al. 1981) who found that 65.4% of student utterances fell into the category of replying. Bellack also reported that students actually structuring their own utterances comprised a mere 1.8% of utterances. It would be useful to investigate whether or not, almost 40 years on, students are spending most of their time replying and reacting to teachers’ talk. Politzer and Ramirez et al. (1981) also measured teacher effectiveness by use of pre and post tests given to the pupils [the content of the lessons was the teaching of standard English negation]. Whilst they concede that this provides a ‘short range’ definition of teacher effectiveness, some interesting patterns emerged from this aspect of the analyses. The

most effective teachers tended to talk less than their students. Another, more definitive conclusion drawn by the researchers was that the most effective teachers tended to elicit information from students more often than inform. The latter finding suggests that students retain information more readily when they are somehow involved in structuring the discourse themselves. More recent research (Hattie 1999, Higgins 2001, Anthony and Knight 1999, Torney-Purta, Hahn, and Amadeo 2001 cited in Alton-Lee 2003) indicates that sustained higher achievement occurs when students are able to “define their own learning goals, ask questions, anticipate the structure of curriculum experiences, use metacognitive strategies... and self monitor” (Alton-Lee, 2003:85). Politzer and Ramirez et al. (1981) focused more on the language functions of the teachers rather than those of the students. Alton-Lee (2003) maintains that students who take control of their own learning are more successful than those who do not. Therefore it is important to examine more closely what language functions they are in fact using, in teaching and learning situations.

Donato and McCormick (1994) maintain that whilst teachers want students to gain communicative competence, they seldom use the strategies associated with its development. They argue that this is because “classrooms often do not provide opportunities for functional language practice” and “often examinations and grading procedures do not reflect a communicative orientation” (Donato and McCormick, 1994:45). Bearing this in mind, it is worthwhile to continue to investigate what language functions students are using in classroom discourse.

The current study is concerned with language functions, in the context of mathematics lessons. Cazden and Beck (2003) suggest that one of the reasons little research has been carried out in non traditional mathematics lessons, is because of the complexity involved in analysing the discourse. A few minutes observing small groups of children involved in learning new maths concepts with a teacher would confirm to even a novice researcher, that the interactions which occur are indeed fast paced, varied, and multi-directional, making them complex and difficult to analyse. However, by selecting one type of interaction to focus on, and using language functions as the unit of analysis, it may be possible to reveal something beyond the surface level of observable discourse.

2.6 Summary

The literature review has sought to justify the current research project by highlighting the continuing failure of mainstream education institutions in meeting the needs of groups of students who make up cultural and linguistic minorities, with specific reference to Pacific Island and Maori students in New Zealand. Further, sociocultural theory has provided the theoretical framework for the study, and combined with the ‘tools’ of classroom discourse analysis will position this research to increase our “understanding, both holistically and in the smallest details, of the social setting as a complex adaptive system” (Van Lier, 2001:90). Examples of research in the areas of minority group language education, classroom discourse, mathematics and discourse, and language functions, have been discussed to highlight areas which have already been investigated and to signal where further contributions would be useful.

The literature reviewed highlights several areas which require future research. Gibbons (2003:248) reminds us of the “considerable linguistic and conceptual distance” between teachers and students, particularly evident when they do not share the same language and cultural background and argues for more qualitative and interpretive approaches to L2 research. Cazden (2001) reiterates the importance of analyzing the problems of distribution in student participation, for teacher researchers. She urges both teachers and researchers to monitor who participates and how, and who doesn’t and why. Bishop and Glynn (1999) provoke us to address the unequal power relationships in classrooms by creating sociocultural contexts where learners can bring their discursive practices to the classroom so that they may successfully participate. Clay (cited in Cazden, 1990) calls for more research investigating cultural differences in communication and identifying classroom situations that maximize opportunities for more extended interactions between students and teachers. Miller (2000) states convincingly that if we do not find ways to ensure active participation of all students in our classroom discourse communities, the effective marginalization of linguistic minority students will put all members of the school community [and I would add the wider community] at risk. Breen (2001c) asserts that there are few studies of learner input in the classroom and reminds us that the research on learner participation which has been conducted has found students positioned in the

responsive role. Swain (1985, cited in Breen 2001c) suggests that one reason students fail is due to the lack of opportunity they have to participate in discourse through their own speech production.

Some researchers have asserted that interactive communication where weight is given to learner as well as teacher contributions is important (Ellis 1984, Van Lier 1988, 1996, Hatch 1992, cited in Gibbons 1998; Black 2004) yet others suggest that overt learner participation does not always lead to better learning (Slimani 1989, 1992 cited in Slimani 2001; Dobinson 1996 cited in Breen 2001c). Clearly then it is important to continue to investigate student participation in classrooms. Indeed, the importance of seeing each learner as an individual with his or her own learning style and set of beliefs about how to go about completing a task whilst at the same time navigating the complex social and cultural context of the classroom, cannot be underestimated. Breen (2001c:313) explains

Different learners will navigate through the discourse of lessons in different ways depending upon their own definitions of the situation, their previous experiences of classrooms, and their particular understanding of the dynamic social practices or culture of the classroom group.

When anticipating a research opportunity then, where one can observe how students are using language and why they are so doing, it is important to keep an open mind about the discourse practices and learning contexts which will be most advantageous for each individual. Furthermore, an examination of the discourse from a range of perspectives is desirable so that both the readily observable as well as the more covert forces at play, can contribute to our understanding of what works best for our students.

2.7 Research questions

The literature reviewed, has revealed several areas which would benefit from further investigation. The aim of this research project is to investigate student initiated interactions of Pacific Island and New Zealand European children with teachers of the same and different cultural backgrounds, in mainstream primary school classrooms.

The two research questions are:

1. To what extent is cultural background of teachers and students a factor in determining the number of student initiated interactions that occur during focus group mathematics lessons?
2. To what extent is cultural background of teachers and students a factor in determining the function of the student initiated interactions?

CHAPTER 3

METHODOLOGY

3.1 General Method

Classrooms are busy places where many interactions, both verbal and non-verbal, occur rapidly and often simultaneously. The classroom communication system is “a problematic medium that cannot be ignored or viewed as transparent by anyone interested in teaching and learning” (Cazden, 2001:3). Analysing discourse in such situations is therefore both important but also unavoidably complex. As already stated, the purpose of this research study was to analyse an aspect of classroom discourse, student initiated interactions with teachers. Having specified a specific language feature, it may at the outset seem that the process of observation and analysis of this would be relatively straightforward and simple. However, it is important to realise that by looking at the interactions in isolation from other forces at play in the classroom, a real understanding of what is happening is unlikely to be achieved. Indeed Nunan (1992) argues that the extraction and analysis of any one classroom action would complicate rather than facilitate description. Therefore, a ‘qualitative inquiry’ approach was adopted for this research project. Richards defines the aim of ‘qualitative inquiry’ as the desire to “understand better some aspect(s) of the lived world” (Richards, 2003:10). The term ‘inquiry’ is chosen rather than ‘research’ as the former focuses more on thinking and questioning, which is the essence of good research (Richards, 2003).

The use of a ‘qualitative inquiry’ approach enabled the researcher to gain a complete picture of not only what was happening in classroom situations when students initiated interaction [or did not initiate interaction] with the teacher, but also why things were occurring as they were. In order for this level of understanding to be reached, it was necessary for several methods of data collection and analysis to occur.

Qualitative research is multi-method in focus, involving an interpretive, naturalistic approach to its subject matter..... Qualitative researchers employ a

wide range of unconnected methods, hoping always to get a better fix on the subject matter at hand.

(Denzin and Lincoln, 1994b, cited in Richards, 2003:11)

The three methods which were employed in this study were structured observation, individual interviews with teachers, and individual interviews with students. Each method will be explained in detail later in the chapter. Nunan explains that studies which employ a number of data collection methods “enable the researcher to obtain a more complete picture of the phenomena under investigation” (1992:103). Whilst the researcher endeavoured to increase her own understanding of students’ initiating behaviour, it is important to note here that this was an exploratory study and the present data is limited in terms of quantity. Findings therefore, are only indicative of patterns that may be worth investigating in more depth, in future studies.

The use of three different data collection methods meant that the research questions would be ‘looked at’ through more than one pair of lenses. In this way, triangulation was achieved. This provided a means of bringing reliability to the research process by “getting a fix on a particular point by viewing it from different perspectives” (Richards, 2003:251). The different perspectives contributed to the researcher’s understanding of the classroom observations.

The classroom observations [which will be described in detail later] provided the initial data set. Students were observed working in small maths groups with their teacher. The interactions which the students initiated, were transcribed, as were the teacher’s subsequent response(s), and the utterances which occurred immediately before the initiation. The purpose of these observations was to quantify student initiated interactions, and then to analyse them according to their language function. In this way, some quantitative data was obtained. Richards justifies the inclusion of quantitative data in qualitative inquiry:

If occasionally more precise quantification has a contribution to make, it would be foolish to deny ourselves this resource on ideological grounds (Richards 2003:11).

The researcher observed the lessons which were also tape-recorded, so that the transcribed episodes would not be viewed in isolation. In this way, non-verbal behaviours, could be recorded, and contribute to ‘thick’ description. ‘Thick’

description means that the 'hard' or quantifiable data will be seen in context – the observable events surrounding [both in time and location] the episodes transcribed would contribute to understanding and analysis. Understanding would be deepened, through subsequent interviews with teachers and students. It was anticipated that some of the unobservable forces contributing to what goes on in classrooms [e.g. individual beliefs and attitudes, prior knowledge of subject matter, prior knowledge of student ability] would be revealed.

The analyses of the observations were shared with teachers in the individual interviews, so that they were able to comment on the findings. These comments would either confirm the researcher's interpretations of the data, or provide alternative insights. If the findings and recommendations are to be taken seriously by teachers, and acted upon, it is vital that teachers see themselves as partners in the research process. Stenhouse asserts:

It is difficult to see how teaching can be improved ... without self monitoring on the part of teachers. A research tradition which is accessible to teachers and which feeds teaching must be created if education is to be significantly improved (Stenhouse 1975, cited in Loughran, Mitchell, & Mitchell, 2002:4).

Individual interviews with some students enabled the researcher to gain insights into their understandings and beliefs about their own cultural backgrounds and those of their teachers. Since one of the aims of the research was to determine whether or not teachers' cultural background had an impact on the amount and nature of student initiated interactions, it made sense to try to understand the children's perspectives surrounding this phenomenon.

3.2 Participants and site

3.2.1 The school

A multicultural central Auckland school provided the context for the research project. The school was chosen because it is large, and includes children from the ethnic groups which are the focus of this study. The following table provides statistics for the major ethnic groups in the school (Vivien, 2004).

Table 1: Percentage of ethnicity of students in school March 2004

Ethnic group	% of total school enrolments
European	23.3
Maori	6.2
Pacific Island	22.3
Asian groups	10
Indian groups	30.7
Other groups	7.5
Total roll	560

As well as having children from the ethnic groups to be focused on, the teachers represent many of these groups, including Maori, Pacific Island, and NZ European. The researcher has had a close affiliation with the school for seven years, having taught there in a part-time capacity from 1998-2002, and having children currently attending the school. This relationship provided ease of access for the researcher and meant the participants were less likely to feel intimidated or uncomfortable whilst participating in the project. As Cohen, Manion, and Morrison (2000:54) state,

Since the researcher's potential for intrusion and perhaps disruption is considerable, amicable relations with the class teacher in particular should be fostered as expeditiously as possible.

Knowing the teachers, however, was not a sufficient basis or justification for gaining access. It was important to clearly state reasons for the research, the benefits and costs involved, and to guarantee the privacy of the participants. All of these things were included as part of the process of gaining ethics approval which will be

described in detail later in this chapter. In addition, the researcher had to prove that she was able to conduct the project in a professional and rigorous manner. For these reasons, informal conversations were with some of the intended teacher participants prior to beginning the project, about the topic and the possibility of being involved. Members of the senior management team had also been talked with about the research topic. Small-scale investigations had already been carried out by the researcher at the school, and teachers had been provided with feedback about the findings and read the subsequent reports. In light of these factors, both teachers and senior management had indicated an interest in and a willingness to be involved in the project as they could see the potential for the work to enhance understanding and possibly even inform practice with students from diverse ethnic backgrounds. The chosen school was appropriate then, because it had the necessary participants, it was 'typical' of the sorts of schools for whom the research outcomes may be of interest, and access for the researcher was relatively straightforward.

3.2.2 Participants

Much of the literature that has been referred to in the previous chapter, has discussed the underachievement minority group students with particular reference to both Maori and Pacific Island students in our classrooms. It was always the intention of this research project to focus on both of these groups, and to compare their initiations with New Zealand European students. Whilst Nunan (1992) emphasizes the need for more research to be conducted in 'genuine' classrooms [ie those specifically constituted for the purposes of teaching and learning rather than those artificially created for the sole purposes of research], one of the disadvantages in so doing, is that one cannot ensure that participants fitting the necessary criteria will be present in the classrooms with the chosen teachers. This proved to be the situation in the current study. The first task was to select and gain consent from the teachers. This was successfully carried out with one Tongan, one Maori, and three New Zealand European teachers, all of whom were part of the same teaching 'team' working with year three students. With the exception of the Tongan teacher who is teaching a 'Tongan Emphasis' class with all Tongan students, it was the intention to then select Maori, Pacific Island, and New Zealand European students in each of the teachers' classes selected. However, as can be seen from *Table 1*, Maori students make up only 6.2% of the school population. It

was unfortunate that there were insufficient numbers of Maori students in the classrooms of the selected teacher participants, to be able to include this group in the study. For the purposes of this research project then, it was only possible to investigate student initiated interactions between students and teachers with New Zealand European, and Pacific Island cultural backgrounds. The study could be replicated in the future to include Maori students.

It was important to limit the number of variables that may affect the data, and this was kept in mind when selecting the participants. For this reason, and also to help with management of the research process, it was decided to work within one 'team' at the school. Most primary schools work with teams of teachers who teach the same year level(s) and usually share similar space in terms of location. Teams usually consist of anywhere between three and six classrooms with one teacher being designated the 'team leader'. By working with participants all from the same team, it meant that the students would fall within the same age group, between eight and nine years, and would be working within the same general topic area for maths [teams usually plan their topics for the term together]. Also, it was easier for the researcher to give information and get feedback by attending the weekly team meetings when necessary. Fortunately, the team chosen to work with consisted of teachers meeting the research criteria in terms of ethnic background and all teachers approached agreed to participate. The following table shows the teacher participants, and in accordance with ethics guidelines, pseudonyms have been used and will continue to be used throughout this report.

Table 2: Teacher participants by gender, ethnicity and year levels taught

Teacher	Gender	Ethnic group	Year level(s) in class
Jose	Female	NZ European	2/3
Karen	Female	NZ European	3
Bill	Male	NZ European	3/4
Mele	Female	Tongan	2/3/4

When the teachers had consented to take part in the project, they were asked to give the researcher a list showing their maths groups, the children in each group, and the ethnicities of the students [all teachers put children in groups of four to eight according to ability for the purpose of small focused maths teaching sessions]. The researcher was hoping to find maths groups which had an equal number of New Zealand European, and Pacific Island students in them. As Nunan (1992) states, unless formal experimental classrooms are set up with the specific purpose of carrying out research, it is very difficult to control the variables. Because the classrooms being studied were ‘genuine classrooms’, that is, real classrooms with real students and teachers, and the researcher wanted to cause as little disruption as possible to normal teaching and learning, it was necessary to choose maths groups which had students in them that came as close as possible to meeting the criteria. This meant that there were not even numbers of New Zealand European and Pacific Island students. In some cases, the maths groups chosen included students from other ethnic groups, and these students’ responses were ignored for the purpose of the this project unless their behaviour directly impacted on the students in the study when they initiated interaction. The following table shows the student participants in the study. Pseudonyms have been used, to protect the identity of the participants.

Table 3: Student participants by gender, ethnicity, age and teacher

Student	Gender	Ethnic group	Age and year level	Teacher
Evan	M	Samoan	7.11 Y3	Jose
Daniel	M	Cook Island Maori	7.8 Y3	Jose
Gina	F	NZ Euro	6.11 Y2	Jose
Olly	M	Niue	8.3 Y3	Karen
Andy	M	Cook Island	8.1 Y3	Karen
Luke	M	NZ Euro	8.0 Y3	Karen
Abby	F	NZ Euro	8.2 Y3	Karen
Jenny	F	NZ Euro	7.10 Y3	Karen
Essie	F	Pacific Island	7.8 Y3	Bill

Kim	F	NZ Euro	7.10	Y3	Bill
Erica	F	NZ Euro	7.9	Y3	Bill
Patsy	F	NZ Euro	7.8	Y3	Bill
Maxwell	M	Tongan	7.10	Y3	Mele
Dan	M	Tongan	8.3	Y3	Mele
Rita	F	Tongan	7.2	Y3	Mele
Joseph	M	Tongan	8.0	Y4	Mele
Sammuel	M	Tongan	7.5	Y3	Mele
Celia	F	Tongan	9.2	Y4	Mele
Totals	M=9 F=9	PI = 11 NZ Euro = 7			

KEY

M Male
 F Female
 NZ Euro New Zealand European
 PI Pacific Island

The sampling for this research project then, was purposive rather than random. Ellis and Barkhuizen state that sampling decisions are crucial in qualitative research and that it is appropriate to *choose* participants who possess the characteristics of the group[s] under investigation (Barkhuizen & Ellis, in press).

3.3 Data Collection and Analysis

3.3.1 Pilot study

Before beginning the actual observation lessons, a pilot lesson was carried out with a group which would not be part of the study. The observation schedule was trialed and minor adjustments made. The amended observation schedule [Appendix A] was used in the actual observations.

3.3.2 Structured observations

The major source of data was transcripts of small focus group maths lessons. As already mentioned, the researcher's initial interest in the topic arose as a result of teaching ESOL students mathematics. In the introduction, statistics illustrating the poor performance of Maori and Pacific Island students in relation to their Asian and European counterparts in the maths curriculum area were provided (Statistics, 2001). In the literature review research which focused on language aspects or mathematics teaching was discussed and it was clear that further investigation is warranted in this area. Lampert et al. (1996) assert that classroom discourse has a significant influence on what students learn about mathematics. The decision to observe maths lessons was further influenced as the researcher's experience had shown that lessons where new material was being taught in this particular curriculum area were likely to require students to initiate interaction. For example, if a new concept has been introduced or a particular method for problem solving demonstrated, students should find themselves in situations where they may need to ask for clarification, request help, or demonstrate prior knowledge or mastery of a skill. As the researcher would be looking for student initiated interactions in particular, choosing the type of lesson where these would be most likely to occur, was a sensible option. In addition to the researcher's own beliefs about the amount of talk that could occur in these lessons, current mathematics pedagogy emphasizes the importance of talk. Recently introduced numeracy projects in primary schools and the National Certificate of Educational Achievement [NCEA] in secondary schools have reinforced the need for students to be able to explain and justify their results verbally, in mathematics (Meaney, 2002). Teachers then, generally agree that oral communication is important and desirable in the mathematics lesson. Tamsin Meaney, a New Zealand secondary school teacher who carried out research in her own mathematics classroom, explains why oral communication is important:

By using language appropriately, students are expected to develop their mathematical understanding through giving meaning to new experiences and in reflecting and relating them to already held ideas, forging new connections. (Meaney, 2002:2).

It was hoped therefore, that the participants would be observed in learning contexts where oral communication was expected and encouraged, and that some of this communication would be initiated by the students themselves.

As the researcher was looking for specific language episodes, a structured observation schedule was designed [Appendix A]. The schedule was designed to provide the simplest and most accurate means of recording these. Quite simply, there is a column for each participant, including the teacher, and each time a student initiated an interaction the researcher wrote the utterance in the appropriate column. The teacher's subsequent response was also recorded. As the lessons were moving at a fast pace, the researcher was aware that she would not be able to write everything accurately and could miss some things. Therefore the audio tape provided supporting data. However, particular note was made of non-verbal behaviours such as nodding and pointing, as these would not be evident on the recording. This type of observation is described by Richards (2003) as 'closed observation' which allows researchers to focus on specific areas that they wish to know more about. The student-initiated interactions and the subsequent teacher responses were transcribed for the purpose of in depth analysis. Richards' (2003:173) transcription conventions were used with some minor adaptations. For example the quotation marks, “ ” were used to indicate speech in Tongan [see Appendix B for a full list of transcription conventions].

The observation schedule [Appendix A] provided the tool for recording observations as they happened. The first step in analyzing the data was to categorise the transcribed initiations at a later stage. Over the last 20 – 30 years, researchers have created categories to help them better understand aspects of classroom interaction they have been trying to understand. Chaudron identified twenty-four different schemes that have been developed (Chaudron 1988, cited in Nunan, 1992). Many of the observation instruments are adaptations, extensions, or simplifications of Flanders' Interaction Analysis Categories [FIAC] which were established in 1970 to look at classroom verbal behaviour, in order to see what could be revealed about teaching and learning processes (Malamah-Thomas, 1987). The studies which have used or adapted the FIAC scheme have had much broader aims than those of this research project. The categories however, provided a starting point for designing an

instrument which would be relevant to the researcher's topic. Nunan's questions for evaluating and selecting a scheme have provided additional guidelines for the selection of appropriate categories (Nunan, 1992:97). The instrument was used when analyzing the audio recordings, rather than in 'real time'. This is because the categories are described by Nunan (1992) as 'high inference', which means the researcher is required to interpret the language heard. It was not possible to make the inferences during the actual lessons, because of the naturally fast pace of the discourse and activity.

The student initiated interactions were categorised according to their language function. Mary Finocchiaro's functional categories (Brumfit & Finocchiaro, 1983) provided the initial guidelines for creating a taxonomy which would be appropriate and useful for analyzing the data. The complete list of functions with definitions and examples from the data is shown below in table four.

Table 4: Functional categories for analysis of student initiated interactions

Function code	Function explanation	An example from the data
Personal		
EF	Expressing frustration	<i>Oh please!</i>
SA	Seeking approval	<i>I've finished Miss T.</i>
EE	Expressing excitement	<i>Oooh cool!</i>
Interpersonal		
GA	Getting teacher's attention / attempting to get teacher's attention	<i>I know, I know, I know!</i>
EG	Expressing gratitude	<i>Thank you Mele.</i>
EU	Expressing understanding	<i>I think I got it now.</i>
IA	Indicating agreement	<i>I thought it was.</i>
MJ	Making a joke	<i>Shall we turn them (ears) on?</i>
Directive		
AGC	Asking for guidance with mathematical content	<i>Miss B, I don't know what to do.</i>
AGP	Asking for guidance with procedures	<i>Can I have a piece of paper?</i>
RC	Requesting clarification	<i>Is that right Karen?</i>
D	disagreeing	<i>Oh no, they're supposed to be on the ten's column.</i>
GI	Giving instructions	<i>Wait wait wait, he needs more.</i>
Referential		
PA	Providing an answer / displaying knowledge	<i>It's a hundred and ten.</i>
EXP E	Explaining an event	<i>Miss B, I'm going to "tongan word for homework centre sounds like foako" where you do different things.</i>
II	Identifying items	<i>I got all red.</i>

While this type of observation was useful for answering specific questions, it is important to be aware of its limitations. The use of a specific observation schedule

with pre-determined categories can prevent the researcher from noticing other events which may also be of importance. For this reason field notes were made at the end of the teacher-led focus group lesson, during the period when students worked independently on a task. This enabled the researcher to determine how well the students understood the concepts taught. The note-taking was based on a *salience hierarchy*, meaning those things that were most relevant and interesting were recorded (Woolfingher 2002, cited in Richards, 2003). In addition to these notes made during the observation, notes were made before the ‘lesson proper’ in order to ‘set the scene’ for the actual lesson. Further, as soon as possible after the observation, notes were made about behaviours and events that seemed salient and that would not be obvious on the tape recording.

3.3.3 Individual interviews with teachers

The limitations of observing and analysing aspects of classroom discourse in isolation have already been mentioned. In order to gain a more comprehensive understanding of what was happening in classrooms and why, the views of those other than the researchers’ were sought. Individual interviews with the teacher participants were conducted. As Cohen et al state:

Interviews enable participants – be they interviewers or interviewees – to discuss their interpretations of the world in which they live, and to express how they regard situations from their own point of view (Cohen et al, 2000:267).

The interviews, which took about 20 minutes each, were conducted after the initial set of data, classroom observations, had been transcribed and analysed. The findings from these provided the basis for the interview discussions. The primary purpose of the interview was to ask the participants to respond to the findings which emerged from the classroom observations. In a sense, the interviews provided a ‘participant confirmation check’. Nunan (1992) describes different types of interviews as being on a continuum from unstructured, through semi-structured, to structured. For this research project semi-structured interviews were carried out. The researcher had a general idea of what should be covered, with some pre-determined topics for discussion. These topics along with some questions provided an ‘interview guide’ [see

Appendix C]. An 'interview guide' is a resource that can be drawn on whenever and however the interviewer deems appropriate (Richards 2003). The interview guide was given to the interviewees a few days prior to the interview. This would enable the interviewee to think about their responses. Some of the questions required the participants to think quite deeply about their own beliefs about culture and how children learn. For example: *Do you think any of your own cultural practices and beliefs impact on the way you teach and interact with students in your classroom? Explain.* By giving the teachers the questions before the interview, it was hoped that their answers would be more considered, providing a more accurate insight into their beliefs. In this type of interview the interviewee has a degree of power and control whilst the interviewer has some flexibility (Nunan 1992).

The primary source of data for this research project was the detailed analysis of the classroom observations and one of the main purposes of the individual interviews was for the teachers to comment on the findings and give their perspectives on these. Therefore, detailed transcriptions of the complete interview were not made. Cohen et al (2000:281) warn us that

the interview is a social encounter, not merely a data collection exercise; the problem with much transcription is that it becomes solely a record of data rather than a record of a social encounter.

Whilst the authors do go on to discuss the value of transcription, such in depth analysis was not necessary for this research project. It is worth noting that,

As with all research traditions, there is no one way of doing qualitative research. The methods chosen to analyse and interpret data should be those that will most appropriately answer the research questions (Barkhuizen and Ellis, in press:3).

Accordingly, each recorded interview was listened to several times, in order to gain a sense of 'whole'. A summary of each interview was written and specific comments from interviewees which were salient, included. Each teacher was provided with his/her summary for comment and necessary adjustments made. The summaries from the four interviews were compared and common themes as well as differences are discussed in the analysis section of this report. The researcher acknowledges the high degree of inference involved in such analysis however, qualitative inquiry is by its

very nature interpretive. Allowing the teachers the opportunity to comment on their summary added depth and credibility to the findings.

3.3.4 Individual interviews with students

Individual interviews with selected student participants were conducted to provide yet another perspective on the research questions. The observations revealed what was happening in classrooms but on their own these could not shed light on why particular things were happening. Talking to the students as well as the teachers was an attempt to provide some of the answers. Students were selected on the basis of the findings from the observation lessons. Different ‘types’ of students were interviewed, for example Pacific Island students who didn’t initiate, and those who did. This selection will be discussed in more detail in the following chapters. By interviewing a range of students, it was hoped that differences in attitudes and beliefs about appropriate classroom behaviour would be revealed. Further, it was thought that some insight may be provided as to why some students initiated often, and others seldom. The first research question asks whether or not children initiate interaction with teachers if they share the same cultural background. In the interviews the children’s understandings about their own cultural backgrounds and those of their teachers were also investigated. As with the individual teacher interviews, these interviews were semi-structured, with some pre-determined questions and topics [see Appendix D].

The individual student interviews were analysed in a similar way to the teacher interviews. Each interview was listened to several times to gain a sense of the ‘whole’. A summary of each interview was written with salient comments or questions included. Further to this recurring relevant themes were identified.

3.4 Ethical approval

Full ethical approval was provided for this research project by Auckland University of Technology Ethics Committee on the 8th of March 2004.

3.4.1 Informed consent from Principal, Board of trustees, and Teachers

The principal was approached first for her approval and given the opportunity to ask questions about the project. Approval was gained and shortly after the chairperson of the Board of Trustees also gave consent. Both of these parties and the teachers were provided with information sheets [see Appendix E].

The researcher spoke to the team leader and arranged to come to a regular team meeting to explain the research project and invite teachers to participate. The teachers asked a number of questions about the study and appeared genuinely interested in the topic. All five of the teachers agreed to participate, but only four were required as it transpired that Maori were not to be part of the project, so the Maori teacher was not included. However, this teacher and a group of students from her class agreed to participate in the pilot lesson, which was most valuable.

3.4.2 Informed consent from students

The process of selecting the participants has been described above in the 'Participants' section. All students selected to be in the study were spoken to as a group by the researcher about the purpose of the project. They were given and made use of the opportunity to ask questions. At this time they were provided with an information sheet and a consent form to be signed by themselves and their parents/guardians [see Appendix H]. All of the students and their parents agreed to take part in the study.

Securing the permission as well as the confidence of research participants are important preliminary steps of 'gaining entry to the field' (Allwright & Bailey, 1991).

3.5 Summary

The purpose of this research project was to provide 'thick description' of an aspect of classroom discourse: the functions of student initiated interactions. One of the aims was to ascertain whether or not there are differences in the number and type of interactions when students are working with teachers of the same or different cultural backgrounds to themselves.

A combination of both quantitative and qualitative analyses was carried out, and the participants' perspectives included. It was vital that the voices of the *researched* were heard if outcomes from the research are to be taken seriously by them.

By choosing three methods of data collection the researcher attempted to make connections “between language learners and a wide range of the components which constitute their contexts” (Barkhuizen and Ellis, in press:6).

CHAPTER 4 FINDINGS

4.1 Introduction

Three types of data were collected and analysed and the findings from each will be presented in this chapter. The results from the classroom observations, the semi-structured teacher interviews, and the semi-structured student interviews will be presented independently of each other here, and in the next chapter they will be critically discussed together, in order to answer the research questions.

4.2 Classroom Observations

A transcription of each lesson was made from the audio recording, along with the notes which the researcher took using the observation schedule [Appendix A]. The talk immediately prior to and after each student initiated utterance was included in the transcription. Notes were taken at the end of each lesson, which indicated how students were managing the maths tasks which had been set as a follow up from the small group lesson, and these were included at the end of each transcription. An example of a transcribed lesson and the accompanying notes is provided in Appendix I.

4.3 Research Question 1: To what extent is cultural background of teachers and students a factor in determining the number of student initiated interactions that occur during focus group mathematics lessons?

4.3.1 Student initiated interactions

The first research question, concerned with the relationship between cultural background and frequency of student initiated interactions with teachers, was addressed with the initial method of data analysis which was to count the number of initiations made by each student. One of the unanticipated findings which emerged

was that some initiations were acknowledged by the teachers and others were not. It was decided to include this information in the data analysis and discuss it later with the teachers to ascertain whether or not it was meaningful, in terms of answering the research questions. Table five indicates the number of initiations made by students during two lessons as well as whether or not they were acknowledged.

Table 5: Student initiated interactions and acknowledgements

Student	Ethnicity	Lesson 1 Initiations acknowledged out of initiations.	Lesson 2 Initiations acknowledged out of initiations	Total initiations	% of initiations acknowledged
Bill's class	NZE				
Erica	NZE	1/1	0/0	3	100%
Patsy	NZE	1/2	absent	2	50%
Kim	NZE	5/9	1/1	10	60%
Essie	Samoan	0/4	0/1	5	0%
Karen's class	NZE				
Jenny	NZE	1/2	0/0	2	50%
Abby	NZE	3/11	1/1	12	30%
Luke	NZE	6/17	4/7	24	41%
Olly	Niuean	0/17	3/12	29	10%
Andy	Cook Island Maori	4/8	1/3	11	45%
Jose's class	NZE				
Gina	NZE	7/8	2/5	13	69%
Daniel	Cook Island Maori	1/6	2/7	13	23%
Evan	Samoan	0/1	1/1	2	50%
Mele's class	Tongan				
Joseph	Tongan	19/24	1/2	26	77%
Dan	Tongan	3/5	absent	5	60%
Maxwell	Tongan	5/9	2/3	12	58%
Sammuel	Tongan	0/0	0/1	1	0%
Rita	Tongan	2/5	1/1	6	50%
Celia	Tongan	absent	0/2	2	0%

KEY

NZE New Zealand European

Two students were absent for the second lesson and one for the first. This was disappointing, but unavoidable due to many other factors, that had to be considered in trying to schedule the observations, for example teachers being released or sick, class trips, and school events.

Clearly, there was considerable variation in the number of initiations made by students. Total number of initiations for a student ranged from 1 to 29. It is also clear that students who had a teacher from the same cultural background as themselves did not initiate more often than those who did not. Olly who is Niuean for example, had the highest total number of initiations, yet worked with Karen, a New Zealand European teacher. The child with the lowest number of initiations over two lessons was a Tongan student - Samuel who worked with Mele, also Tongan. Similarly, New Zealand European students did not necessarily initiate more with New Zealand European teachers as can be seen when looking at Jenny and Erica's results.

4.3.2 Teachers' acknowledgements of student-initiated interactions

Teachers' acknowledgements of student initiated interactions included any response from him/her that the child's utterance had been heard. This may have been positive, for example *well done* or negative, for example *don't call out*. The acknowledgement may also have been verbal or non-verbal. The latter was not able to be recorded on audio tape and so the recording of non-verbal acknowledgements was reliant on the researcher's observations during the actual lesson. It is acknowledged that this method of data collection was not completely reliable as it was not always possible to see and record all non-verbal actions made by the teacher. However, some interesting results emerged from this analysis. Some students were acknowledged often or most of the time, while others were barely acknowledged at all. Olly, who had the highest number of initiations, was only acknowledged ten percent of the time by his New Zealand European teacher. Joseph, who also initiated comparatively frequently, was acknowledged 77% of the time by his Tongan teacher. This data also shows that both Bill and Jose who are New Zealand European teachers acknowledge their Pacific Island students, less than their New Zealand European students. It is important to note when interpreting the information from Bill and Jose's groups, that

the numbers of initiations are low [between 2 and 13], and so percentages can be misleading. Data from the teacher interviews, which will be outlined later in the chapter, shed some light on the reasons for some of the differences in levels of acknowledgement, as well as differences in overall levels of initiation.

4.3.3 Observations of the independent follow up tasks

The observations and notes made when the students were working independently on the maths tasks at the end of each small group focus lesson were invaluable as these enabled the researcher to ascertain whether or not the students had understood what had been taught. In some instances it was necessary for the researcher to talk with the children to be sure she had made an accurate assessment of their understanding of the task. For example, Abby in Karen's class completed the first half of a worksheet accurately, but the second half was incorrect. When questioned, it became evident that she did know what to do, but wrote the incorrect answers quickly when the other children finished before her, so she could join them to play a game. During the same lesson Andy appeared to be copying a child and therefore all of his answers were correct on his worksheet. When questioned, it was clear that he did not know how to complete the problems by himself. Table six shows the degree to which students were able to manage their maths tasks.

Table 6: Students' total number of initiations, ethnicity, and ability to complete set tasks

Student	Ethnicity	Initiations over two lessons	Ability to complete maths follow up tasks
Erica	NZE	3	H
Patsy	NZE	2	H
Kim	NZE	10	H
Essie	NZE	5	H
Jenny	NZE	2	H
Abby	NZE	12	M
Luke	NZE	24	H
Olly	Niuean	29	M

Andy	Cook Island Maori	11	L
Gina	NZE	13	M
Daniel	Cook Island Maori	13	H
Evan	Samoan	2	M
Joseph	Tongan	26	M
Dan	Tongan	5	L
Maxwell	Tongan	12	M
Sammuel	Tongan	1	H
Rita	Tongan	6	L
Celia	Tongan	2	M

KEY

- H high ability, able to complete tasks with a high degree of accuracy
M medium ability, able to complete tasks but still some errors
L low ability, not able to complete task

This data revealed that frequency of initiating interactions was not a factor in whether or not students were able to understand and complete the maths tasks. Some students with very low levels of initiations completed the maths tasks confidently and easily, for example Jenny, and Erica. Other students with high levels of initiation were not able to complete their tasks accurately for example Joseph. The three students who were least able to complete their maths tasks, Andy, Rita, and Dan, had relatively low levels of initiation 13, 6, and 5 respectively. The children who displayed medium levels of ability varied in their levels of initiation. Sammuel for example was an infrequent initiator, whilst Olly was the most frequent of all the student participants.

As well as observing what the children did during their follow up task, the researcher observed the teachers. Most of the time the teachers were involved with teaching another group, however in four of the eight lessons observed in total, the teacher returned to the group working independently to check on what they were doing. On two of these occasions the teachers made ‘on task’ observations which were checks to see if the students were engaged and carrying out the task procedures. For example they asked things like *Have you put the date at the top of your page?* Bill was the

only teacher to return in both lessons observed to see what his students were doing, and when he did so, he checked their actual understanding of the task.

4.3.4 Teacher variation and student initiated interactions

As well as examining numbers of initiations made by individual students, it was decided to calculate initiations made in total with each teacher, in order to see more clearly whether or not there were noticeable differences between them. Table seven illustrates the number of initiations made by students in each teacher's room. It also shows the total amount of lesson time observed and the frequency of acknowledgements made by the teachers. It was important to consider the amount of time each teacher was observed, because if some were observed for longer periods than others, then this would affect the number of initiations which could occur.

Table 7: Initiations made with each teacher, rate of acknowledging, and length of time observed

Teacher	Initiations made by chn over 2 lessons	Acknowledgements in 2 lessons	Chn participating in 2 lessons	Average initiations per child over 2 lessons	% of initiations acknowledged	Total length of 2 lessons in minutes
Karen	76	23	10	7.6	30.2%	42
Bill	19	8	7	2.7	42%	43
Jose	28	13	6	4.6	46.4%	41
Mele	52	33	10	5.2	63.4%	44

Overall, each teacher was observed for a total of between 41 and 44 minutes so this was not considered a factor in the number of initiations which occurred.

It was important to include the average number of initiations with each teacher, rather than just give a total because there were different numbers of students observed in each room, and occasionally students were absent. The average was calculated by dividing the total number of initiations made with each teacher, by the total number of students who were present for two lessons.

There was considerable variation between the teachers in terms of the amount of initiating happening during their lessons, as well as the level of acknowledgement each gave. Karen had the highest amount of initiating happening in her lessons, and yet she acknowledged her students least often. Mele had the next highest number of initiations, and acknowledged her students most often. Jose and Bill had lower levels of initiations than the other two teachers. Whilst these findings will be discussed in depth in the next chapter, it is interesting to note here, that both Jose and Bill are in their second year of teaching, whilst Karen has been teaching for 13 years, and Mele, seven and a half years.

4.4 Research Question 2: To what extent is cultural background of teachers and students a factor in determining the function of the student initiated interactions?

4.4.1 Language functions of the student initiated interactions

The second research question was concerned with the extent to which cultural background was a factor in the language functions of the student initiated interactions. Each initiation was given a code corresponding with a specific function [outlined in the Methodology section, page 45]. Tables 8 - 11 show the functions of initiations made by students in each class. The students' ethnicity is also indicated under each of their names.

Table 8: Students, ethnic group, initiation function – Bill's group

Function	Patsy NZE	Erica NZE	Kim NZE	Essie S
EF				
SA				1
EE	2	1	1	3
GA				
EG				
EU			2	1
IA			1	1
MJ				
AGC				
AGP			4	
RC	1		1	
D				
GI				
PA			1	
EXE			1	
II		1		
Totals	3	2	11	6

KEY

FUNCTIONS

EF	expressing frustration
SA	seeking approval
EE	expressing excitement
GA	getting teacher's attention
EG	expressing gratitude
EU	expressing understanding
IA	indicating agreement
MJ	making a joke
AGC	asking for guidance with mathematical content
ACP	asking for guidance with procedures
RC	requesting clarification
D	disagreeing
GI	giving instructions
PA	providing answers/ displaying knowledge
EXPE	explaining an event
II	identifying items

ETHNICITY

NZE	New Zealand European
S	Samoan
N	Niuean
CIM	Cook Island Maori
T	Tongan

Table 9: Students, ethnic group, initiation function – Jose’s group

Function	Gina NZE	Daniel CIM	Evan S
EF		2	
SA	3		
EE		1	
GA			
EG			
EU		3	
IA	2	1	
MJ	1		
AGC			
AGP	2		
RC	1	2	1
D			
GI		1	
PA	1	1	1
EXE	1	2	
II	1		
Totals	12	13	2

KEY

FUNCTIONS

EF	expressing frustration
SA	seeking approval
EE	expressing excitement
GA	getting teacher’s attention
EG	expressing gratitude
EU	expressing understanding
IA	indicating agreement
MJ	making a joke
AGC	asking for guidance with mathematical content
ACP	asking for guidance with procedures
RC	requesting clarification
D	disagreeing
GI	giving instructions
PA	providing answers/ displaying knowledge
EXPE	explaining an event
II	identifying items

ETHNICITY

NZE	New Zealand European
S	Samoan
N	Niuean
CIM	Cook Island Maori
T	Tongan

Table 10: Students, ethnic group, initiation function - Karen's group

Function	Jenny NZE	Abby NZE	Luke NZE	Olly N	Andy CIM
EF					
SA			2	2	2
EE		2	1	3	
GA		1		1	
EG					
EU		1	2	1	2
IA	1	2	6	1	
MJ		1			
AGC				1	1
AGP		1	4	6	2
RC	1	1	1		2
D			1	2	
GI			1	2	
PA		1	6	7	2
EXE		1			
II		1		3	
Totals	2	12	23	29	11

KEY

FUNCTIONS

EF	expressing frustration
SA	seeking approval
EE	expressing excitement
GA	getting teacher's attention
EG	expressing gratitude
EU	expressing understanding
IA	indicating agreement
MJ	making a joke
AGC	asking for guidance with mathematical content
ACP	asking for guidance with procedures
RC	requesting clarification
D	disagreeing
GI	giving instructions
PA	providing answers/ displaying knowledge
EXPE	explaining an event
II	identifying items

ETHNICITY

NZE	New Zealand European
S	Samoan
N	Niuean
CIM	Cook Island Maori
T	Tongan

Table 11: Students, ethnic group, initiation function –Mele’s group

Function	Joseph T	Dan T	Maxwell T	Sammuel T	Rita T	Celia T
EF	1					
SA						
EE						
GA	3		3			
EG	1		1			1
EU	1					
IA						
MJ						
AGC	1	3				
AGP			2		2	
RC			2			
D						
GI						
PA	17		3	3	4	1
EXE	3					
II						
Totals	27	3	11	3	6	2

KEY

FUNCTIONS

EF	expressing frustration
SA	seeking approval
EE	expressing excitement
GA	getting teacher’s attention
EG	expressing gratitude
EU	expressing understanding
IA	indicating agreement
MJ	making a joke
AGC	asking for guidance with mathematical content
ACP	asking for guidance with procedures
RC	requesting clarification
D	disagreeing
GI	giving instructions
PA	providing answers/ displaying knowledge
EXPE	explaining an event
II	identifying items

ETHNICITY

NZE	New Zealand European
S	Samoan
N	Niuean
CIM	Cook Island Maori
T	Tongan

As there were 16 functional categories, and the numbers of initiations made by students ranged from 2 to 29, it is not surprising that few clear patterns emerged from this data. What can be seen is that those students who initiated most often – Luke, Olly, and Joseph, - tended to do so in order to provide an answer or display knowledge. A clearer picture of what occurred with the initiations can be seen from Table 12 which outlines how often each function was used with individual teachers.

Table 12: Frequency of language functions for each teacher, and percentage of total number of initiations

Teacher	Karen	Bill	Jose	Mele	Total	% of total initiations
Function						
Personal						
EF			2	1	3	1.7
SA	6	1	3		10	5.9
EE	6	4	1		11	6.5
Interpersonal						
GA	2			7	9	5.3
EG				4	4	2.3
EU	6	3	3	1	13	7.7
IA	9	2	3		14	8.3
MJ	1		1		2	1.1
Directive						
AGC	2			4	6	3.5
AGP	13	4	2	2	21	12.5
RC	5	2	4	2	13	7.7
D	2				2	1.1
GI	3		1		4	2.3
Referential						
PA	16	1	3	25	45	26.7
EXP E		1	3	3	7	4.1
II	4	1	1		6	3.5
Totals					170	100

KEY

FUNCTIONS

EF	expressing frustration
	Procedures
RC	requesting clarification
D	disagreeing
GI	giving instructions
PA	providing answers/ displaying knowledge
EXP E	explaining an event
II	identifying items
SA	seeking approval
EE	expressing excitement

ETHNICITY

ACP	asking for guidance with
EU	expressing understanding
IA	indicating agreement
MJ	making a joke
AGC	asking for guidance with mathematical content
GA	getting teacher's attention
EG	expressing gratitude

Table 12 shows that by far the most frequent language function was to provide an answer or display knowledge. These made up 26.7% of the total number of initiations. The following lesson extract is typical of this type of initiation. For this lesson in Karen's class the students were learning about place value of 3 digit numerals, using an abacus and different coloured beads. In all the extracts which follow the actual initiation is indicated with the * sign while T will be substituted for Teacher, and S1 or S2 for individual students.

T: That's right, it's showing hundreds, tens, and ones ((responding to S1))

**S2: These are thousands*

T: Do you know what it's called? ((holding up abacus to show students))

In this example, S2 initiated an interaction by attempting to interrupt and display his knowledge about the value of a part of the abacus when it was not his turn. In this particular instance, the teacher did not appear to acknowledge the initiation but carried on with her next question to the group.

The next most frequent language function was to ask for guidance with procedures, which made up 12.5% of the total number of initiations. Following is a typical example of this type of initiation and occurred in Mele's class when the children were working on simple addition problems using counters and small white boards with pens to write their equations.

S1: Finished Miss B

T: Yeah

**S2: Miss B I don't have a pen*

T: You have to use =

Here, the student, S2 didn't directly ask for a pen, but the function of the statement was in fact to find out what to do as she could not find one. The teacher began to explain, but was interrupted by another student.

The function 'asking for guidance with mathematical content' made up only 3.5% of the total number of initiations while 'requesting clarification' comprised 7.7% of the total number of initiations. Results such as these were shared with the teacher

participants during their individual interviews, in an attempt to gain insight into why they occurred. Findings from these interviews will be presented in the following section.

4.5 Semi-structured teacher interviews

Each teacher was interviewed for about one hour and the interview questions [Appendix C] were used to guide the discussions. The teachers were interested in the results of the classroom observations and their willingness to give their opinions on the issues raised was evidenced by their often lengthy and consistently thoughtful responses.

Results from the classroom observations indicated that cultural background did not seem to be a factor in the amount or type of student initiated interactions which occurred during maths lessons. However, some students initiated far more frequently than others, and there were differences in the number of initiations made with each teacher and the rate at which they acknowledged their students. The purpose of the interviews then, was to investigate reasons for some of these differences. Furthermore, as has already been stated in previous chapters, observing the surface features of classroom discourse can reveal only a fraction of that which contributes to students' learning opportunities. As Breen tells us "the discourse of the classroom does not itself reveal what the teachers and learners experience from that discourse" (Breen, 2001a:126). It was anticipated that the interviews would reveal what Breen (2001a) describes as teachers' personal purposes, attitudes, and preferred ways of doing things.

To begin with a brief 'description' based on the summarized responses of each teacher will be provided. [An example of a summarized interview is provided in Appendix J.]. This is important because both research questions are concerned with the cultural background of the teachers as well as the students. By investigating teachers' beliefs about cultural background and its significance in terms of learning opportunities in their classrooms, possible reasons for students' differential experiences may begin to emerge. Following these descriptions, the recurring themes from the interviews, which contribute to answering the research questions, will be

presented. Extracts from the interviews will be included to illuminate some points. In these instances ‘R’ refers to the researcher, and the other letters correspond to the pseudonyms for each teacher participant.

4.5.1 Bill

Bill does not believe that there is a New Zealand European culture that pervades our mainstream classrooms. He does not think that he has a ‘culture’ that impacts on his teaching. The following interview extract illustrates Bill’s beliefs about culture.

R: Do you think any of your own cultural practices and beliefs, or your ideologies, your values, impact on the way YOU teach and interact with your – with students in your classroom?

B: Mmmm my cultural practices, what ARE my cultural practices?((chuckling))

R: Yeah

B: I mean, I guess (xxx) a strong cultural, you know what I mean?

R: Mmm, that’s interesting

B: Because I mean, you see Samoan children, you see Tongan children, you’ve got Maori (xxx) you know there’s a – they have something, whether it’s with their art, dance, or music, but

R: That’s interesting -

B: Yeah, we just sorta yeah (...) there’s nothing really, yeah, I mean when you think about it, when people think about New Zealand, yeah, the stuff that you know, quite often the art and the music, quite often it’s from the Maori culture, whereas I don’t think we (...) we don’t really have a (xxx)

Whilst this shows that Bill does not believe that New Zealand Europeans have a culture, he does acknowledge that he has particular *beliefs* that impact on the way he interacts with children – his teaching philosophy. His beliefs include building trust with children by working on relationships, and showing an interest in children by *getting down to their level* and joking and *mucking around* with them. Bill explains that he does not make rules surrounding talk during maths lessons explicit to his students, but expects that they ‘know’ what they are and are not allowed to do. Bill’s teaching is clearly guided by the lesson plan. He is very aware of what he has to ‘get

through' in a lesson, a day, and beyond. Bill would like to have more opportunities for children to talk and share in his classroom and would like to provide more verbal feedback to the students, but feels very constrained by the amount of content he has to 'cover'. The following statement illustrates his frustration.

B: The way the curriculum is at the moment, if they understand you just move on.

When looking at the classroom observation data from his own lessons, Bill explained that the reason he didn't give much acknowledgement was because he wasn't *into that airy fairy stuff of saying 'well done' all the time.*

Bill is aware of some cultural differences Pacific Island students have which may impact on the way they behave and learn in the classroom but feels that by utilizing group work strategies that involve all children, he will overcome these differences. He believes that once second language learners have mastered playground language, they are 'fine'.

4.5.2 Jose

When talking about her own cultural beliefs and how these might impact on her classroom teaching, Jose found it difficult to differentiate between a 'cultural' belief and personality or 'teaching style'. During the interview, however, she came to the realization that there is a New Zealand European culture, which she is part of, which may impact on the way her classroom operates. It was clear that the actual interview process itself helped Jose to begin to formulate these thoughts.

R: Alright, so do you think any of your OWN cultural practices and beliefs -

J: Oh definitely

R: Impact on the way you teach and interact? So that was a pretty quick answer, so could you explain?

J: I think if you didn't then there'd be something wrong with you. Mainly it's not really cultural for me, it would be beliefs and how I felt at school, my own school experiences.

R: Oh ok

J: It's not really a cultural thing although, my parents would come into that quite a bit, but um (3) yeah

Jose went on to describe some of her own school experiences and teachers, as well as her parents, and then referred back to culture.

J: See I had a lot of white teachers, pretty much all my lecturers at university from my post grad were white...

R: Mmmm

J: So they're in a way imparting on, they're giving me knowledge from their European Western kind of (...) background as well.

R: Mmmm, so do you think that perpetuates, continues in your classroom or?

J: Yeah

Jose is aware that Pacific Island families have particular cultural practices which do impact on the way some children behave and learn, and cited different attitudes toward discipline as an example. She also believes that many Pasifika students and their families do not conform to commonly held beliefs about their cultural ways of being and doing. She believes that family background is more significant than culture in influencing whether or not children will initiate interaction in the classroom.

Jose is in her second year of teaching and explained that children's behaviour had been an issue for her the previous year, and so is very focused on management and control and acknowledges that her 'rules' may inhibit student initiated interactions. When asked what she would like children to do when they are having difficulty with maths she replied,

Ideally I'd like them to ask me but I know a lot of them, I just think a lot of them think, I think a lot of them feel scared to ask...

Jose was extremely reflective about her teaching and said that the interview questions had really made her think about how interaction occurred in her classroom. She was dissatisfied with the level of student initiated talk but was not sure how to change things. The following example illustrates this dissatisfaction and uncertainty.

R: Do you think students initiate interaction very often in your small maths groups?

J: No, not really.

R: Why do you think that is? What do you put that down to?

J: Well, maybe cos I'm just so chatty and vocal, I don't give them a chance. I don't know like, cos I'm wanting them to think all the time, like I'm asking them all the questions?

R: Yes, so you're directing...

J: Yeah, and I'd love it to be more THEM and take a step back so they can start questioning, but I think I just take over...

4.5.3 Karen

Karen is the most experienced teacher in the group, having taught for 13 years. She believes that New Zealand European children have an advantage over other students when they first begin school because their culture 'matches' that of the classroom. Although she didn't use the actual words 'cultural capital' she referred to her belief that New Zealand European children are more used to exploring their environment than Pacific Island students and therefore *they're like sponges* when they first arrive at school. She believes that children and teachers who share the same culture can relate more easily to one another because they are likely to share similar experiences, although admits that this is not easy to explain, as can be seen in the following interview extract.

R: So do you think that any of your own cultural beliefs impact on the way you teach and interact in the classroom?

K: Um I do, but I would find it very difficult to explain

R: Yeah

K: Um... I think that because I hear my culture echoed in some of the children, that's why I think that and sometimes when I'm talking with the class, I SEE, I can see the children who are understanding what I'm talking about, cos it is a cultural, same culture stuff –

R: Yeah yeah

K: You know, when you're talking about baches and holidays and talking about festivals or Easter things...

Karen thinks that culture could play a part in whether or not some children initiate interaction with a teacher, but also says this is not the case with all children, because

personality is an important factor. Her uncertainty concerning this issue is highlighted when talking about two Pacific Island students who were in her class the previous year.

I definitely felt they would have benefited from a same culture teacher, and yet they responded well to me, but I still felt there was something missing.

Karen likes to allow ‘uncontrolled’ talk to occur during her maths lessons because she believes that as a teacher you can learn a lot about children when you listen to them trying to work things out for themselves. She does have specific rules, for example *When you know the answer, smile and fold your arms.* When looking at the data from the classroom observations, Karen explained that her low level of acknowledging could be because she often gives non-verbal feedback, such as nods and smiles.

4.5.4 Mele

Mele strongly believes that New Zealand European values, beliefs and cultural practices pervade the mainstream education system, and this is based to a considerable degree on her own experiences as a young Tongan person, entering school in the seventh form in Dunedin. She talked passionately about such experiences as the following extract shows.

M: I know what it's like being a PI – only Pacific Island student in the seventh form in Dunedin. I know what it's like... sometimes you walked in the door, you left all your Tongan things outside... then you come and try to live in the Pakeha world, but if you try to stay true to your culture you can still succeed.

While the above extract shows that Mele holds strong beliefs about the culture New Zealand classrooms, she seems to hold two beliefs about culture of the teacher and its impact on students’ learning. She believes that children will respond well to a teacher from any culture who demonstrates a genuine interest in them, makes an effort to find out about their background, and resists stereotyping them. However, she also talks frequently about how well she relates to her students and they to her, because of their common culture. On several occasions she cited examples of parents who had told her that their children are happier and achieving more in her class now than they had done in previous years with New Zealand European teachers. She attributes

understanding the same language as one of the reasons her students relate well to her, as in the following example.

Children do ask me the questions in Tongan, because I always allow it. "You don't understand it in English, you can ask me, ask me that in Tongan."

She continued a little further on, talking more generally about culture.

M: The kids in my class they could relate more to me. They talk MORE with me, I guess because of the background, that I understand their culture.

R: More with you than...

M: Than with European teachers.

Mele talked a lot about giving her students 'the big picture' of education. For example she talked often to her class about the low achievement of Pacific Island students and how hard parents worked so their children could receive a good education. Many of Mele's comments indicated she was aware of caring for the 'whole child' e.g. she talked to parents about healthy eating, she talked to the children about the special bond she had with them. It was clear that Mele viewed her students as her responsibility on a very deep level, as the following comment indicates.

I feel at home working with my own people and at the same time I still have to monitor and be firm with them because I want them to know that no one in the school loves them more than I love them.

Mele understands that Pacific Island students do have particular cultural traits that impact on the ways they interact in the classroom. The following examples illustrate this.

A lot of Pacific kids who are not confident, they rather tell their buddy, their friend...but I guess because a lot of Pacific kids are quite shy...

And later on,

Cos um, some children were brought up by their parents, "You go to school, just listen to the teacher, DON'T question the teacher" I guess they got that from home.

Although she gives these examples, Mele also stresses the importance of not stereotyping Pacific Island students. She talked about home background being an important factor in whether or not students were confident to talk in class. When she looked at the data from the classroom observations and saw that she acknowledged her students more often than the other teachers, she said that she made a conscious effort to give positive feedback to her students because she felt this was important

because she believed that pakeha teachers did not often acknowledge Pacific Island students. She was very focused on building the self esteem of her students.

The brief descriptions above in this section have attempted to provide an overall 'picture' of each teacher. Having analysed the data from their individual interviews, some common themes emerged which will now be presented.

4.6 Recurring themes from the semi-structured teacher interviews

4.6.1 Strategies for 'what to do when you don't know what to do'.

All teachers said they observed students' body language during small group teaching lessons, to ascertain whether or not a student had grasped a concept and provided extra support when it was needed. It was common for teachers to keep children who they felt were 'struggling' on the mat for extra help, once other children had begun their independent tasks. Teachers felt that students were carefully guided through a lesson sequence which should ensure they were able to understand mathematical content. All said they would like students to be able to ask them if they were having difficulty, but admitted that some students would not be comfortable to do this.

When students were working on independent follow-up tasks, teachers expected them to ask for help from a peer in the first instance. Seeking help from the teacher was discouraged as he/she would be working with another group. One exception to this was Mele, who was observed tolerating quite frequent interruptions from other children when working with a small group and dealt with questions quickly in such instances.

Further analysis of responses to the interview question: *What guidelines / rules / procedures (if any) do you have surrounding talk and discussion during maths lessons?* yielded some interesting data. The explicit rules the teachers talked about were all rules for what the children should do when they did know the answer. These included putting your hand up, putting your finger on your nose, folding your arms and smiling when you have the answer. So, although the teachers talked about strategies they used when they could see children could not understand something, the

rules they made explicit to the children, were concerned with what to do when they did know the answer.

4.6.2 The cultural background of students and the cultural background of teachers

All the teachers believed that students' personalities and home backgrounds were more likely to influence whether or not they would initiate interaction with a teacher, than cultural background. However, they also cited examples of students for whom this may not be the case, indicating a degree of uncertainty about this issue. Each teacher talked about the importance of establishing positive relationships with children in order to foster their self esteem and willingness to take risks.

Whilst all were aware of cultural practices Pacific Island students may bring to school which could influence the way they interact, they were reluctant to stereotype children. To a lesser degree, teachers were able to talk about cultural practices of NZ European children and there was some indication that teachers understood that these 'matched' cultural practices of the classroom.

4.6.3 Levels of student initiated interactions

In general, teachers were not surprised at the levels of initiation which occurred during the lessons observed. They were aware that they did most of the talking and directing of the lessons but said that this was necessary to meet the objectives of the lesson. All would like to provide more opportunities for students to initiate talk, not only in maths lessons, but in other curriculum areas as well. Bill and Jose in particular, felt constrained by time, the demands of the curriculum, and the number of children in their classrooms (31 and 27 respectively).

4.6.4 Awareness of issues of 'cultural capital'

Teachers differed considerably in their beliefs about whether or not there was a New Zealand European culture which pervades mainstream classrooms, and thereby impacts on students' learning opportunities. Their opinions about this concept have been outlined above in each teacher's 'description'. The diagram below gives an

indication of how the teachers can be compared in their understandings of ‘cultural capital’.



Bill’s comments in the interview revealed that he did not think that New Zealand European culture influenced what went on in New Zealand classrooms, while Mele, at the opposite end of the continuum held quite different beliefs about this. Karen and Jose were both aware of the influence of New Zealand European culture on mainstream education, but to a lesser degree than Mele.

Another important theme which emerged when teachers were talking about cultural practices of different groups, which has hitherto been implied, but not stated, is that teachers found this issue complex and often difficult to explain. It was clear when talking with all teachers that the interview process itself provided them an opportunity to think about these ideas and reflect on how they may impact on the teaching and learning that was happening in their classrooms.

At the beginning of this section it was stated that the purpose of conducting teacher interviews was to gain an insight into their perspectives, attitudes and beliefs in relation to the research questions. This done, it was apparent that the teachers had certain assumptions about what the children understood about classroom rules and procedures surrounding talk during maths lessons. It was a logical progression then, to investigate whether or not the students did in fact understand what their teachers had assumed. Findings from the individual student interviews will be presented next.

4.7 Semi-structured student interviews

Findings from the classroom observations revealed considerable differences between the students in terms of the frequency of their initiations and their ability to carry out

maths tasks. The purpose of the student interviews was to attempt to gain a deeper understanding into the reasons for these differences. It was important to gain some insight into the children's understandings of their own cultural backgrounds as well as their teachers', and to discover whether or not they were aware of the rules and procedures that were seemingly in place in their classrooms.

It was not possible to interview all student participants due to time constraints and so two students from each class [eight in total] were selected, as shown in table 13 below.

Table 13: Students interviewed , teachers and ethnic groups

Student	Ethnicity	Teacher	Ethnicity
Essie	Samoan	Bill	NZE
Kim	NZE	Bill	NZE
Evan	Samoan	Jose	NZE
Gina	NZE	Jose	NZE
Andy	Cook Island Maori	Karen	NZE
Luke	NZE	Karen	NZE
Maxwell	Tongan	Mele	Tongan
Rita	Tongan	Mele	Tongan

KEY

NZE New Zealand European

Students were selected so that a range of perspectives could be gained. Rita, Andy, and Evan did not find their maths tasks easy, and yet seldom initiated interaction with the teacher. Kim, Luke, and Gina were frequent initiators and all coped well with their maths tasks during the observation lessons. Essie seldom initiated and yet coped well with her maths tasks. Maxwell was a frequent initiator but still needed some assistance with maths tasks.

Each interview lasted 10 – 15 minutes and a set of questions was used to guide the interview [Appendix D]. Each student's interview was summarized and salient

comments transcribed in detail. An example of an interview summary is provided in Appendix K. After the interviews were summarized recurring themes which could contribute to answering the research questions emerged and these are presented below.

4.8 Recurring themes from student interviews

4.8.1 Parents' influence

When asked if their parents / caregivers talked to them about how to behave and learn at school all the children except for Kim and Essie said that they did. Most of the examples were fairly typical of what parents might be expected to say to their children for example *be good and listen to the teacher*. Maxwell had a long list of instructions from his parents as can be seen from the extract below.

R: What do your parents say to you?

M: To respect the reliever as much as you respect the teacher.

R: What else do they tell you?

M: And that to follow the teacher's rules, that she says, and make her job easy, everyday and that to don't muck around in the classroom. When she's in a hurry somewhere to go, like if we're in a hurry get all your stuff that your need to pack and then leave with her.

4.8.2 Awareness of culture

All except one child, Gina, was able to talk about their cultural background. Gina was able to say she was from Pukekohe, but couldn't identify the country or culture she was from. In general, most of the children thought that it didn't matter what culture their teacher came from. However, the Tongan students in Mele's class clearly valued having a teacher from the same culture as the following extract from Maxwell's interview illustrates.

R: Do you like having a teacher who comes from the same country as you?

M: I like um, I like my teacher when she comes from my country because she, we can, she can tell us more about Tonga and we can learn how to say more words in Tongan, and that she, she, she helps us on everything and helps us when we're stuck on Tongan words and stuff that we don't know.

R: And um who did you have for your teacher last year?

M: Miss S

R: And did she come from the same country as you or a different country?

M: Different.

R: What's more useful for you, do you think? What's better for you? Is it better for you to have a teacher from the same country or a different country or it doesn't matter?

M: Same country.

R: Why's that?

M: Cos I wanna learn more Tongan and that I love, I love this culture because you, cos I can speak two languages, and that um, that Tongan people they like they they make the best tapas out of all the islands.

Of the remaining Pacific Island students with New Zealand European teachers who were interviewed, Essie was the only one who thought it might be good to have a teacher of the same culture to learn more of her mother tongue, Samoan. Other students also thought language was important, but for different reasons as can be seen in the following two extracts. The first is from Gina, and the second from Luke, both of whom are NZ European students with NZ European teachers.

R: When you think about the sort of teacher you should have, do you think it's important to have a teacher from the same country as you, or a different country, or do you think it doesn't matter?

G: A different country cos you can learn different languages.

R: That's interesting. What languages would you like to learn?

G: Um... Maori.

Luke thinks language is important for a different reason.

R: Do you like having a teacher from the same country as you? Do you think that's important or do you think that it doesn't matter what country your teacher comes from?

L: Um (3) important?

R: Mmmm, why do you think it's important?

L: In case they can't say all the words if they're from a different country.

Overall, the children's responses indicated that they had varying levels of awareness of both their own cultural background and that of their teachers and there was a tendency to link language with culture.

4.8.3 Learning strategies

At the beginning of this chapter it was stated that some of the findings were unexpected. Students' self reporting of the use of learning strategies during maths emerged as one such finding. The children were asked about the rules they had to remember when working in their maths groups with the teacher, and when working independently. They were also asked what they did when they knew the answers, and what they did when they didn't know the answers. Close analysis of the interview responses revealed that they could be categorised according to the type of strategy employed. Three strategy types were identified:

1. learning strategies – these were specific actions the student could take that would actually help them to solve a problem e.g. look at the instructions on the worksheet;
2. non-specific general strategies – these were more general strategies, which on their own, would not help them to solve a problem e.g. try your best;
3. procedural strategies – these were strategies which would ensure the group and class would work in a cooperative and cohesive manner e.g. take turns.

Each student's interview summary was coded according to the strategies and a table illustrating all the strategies used by each student is included in Appendix L. Table 14 below shows the number of strategies each student used in each category.

Table 14 Students, ability to complete maths tasks, strategy use

Student	Ability to complete maths tasks	Specific learning strategies	Non specific general strategies	Procedural strategies	Total number of strategies
Kim	H	5		5	10
Essie	H	8	2	1	11
Gina	H	2	1	2	5
Evan	M	3	2	6	11
Andy	L	1	1	2	4
Luke	M	3	2	2	7
Rita	L	1	1	2	4
Maxwell	M	2	5	5	12

KEY

- H high ability to complete maths tasks
M medium ability to complete maths tasks
L low ability to complete maths tasks

The two students who have been identified as low achievers, Rita and Andy, clearly reported fewer strategies overall than the more able students and were able to identify only one specific learning strategy. For Rita this was to *ask the teacher for help*, and Andy reported that he would *ask someone for help*. Kim and Essie, both high achievers, reported the highest number of specific learning strategies. The following interview extracts illustrate the types of specific learning strategies the girls talk about using.

R: What do you think the teacher wants you to do if you're finding the work a little bit hard? What do you think Mr B would want you to be doing?

E: Maybe if we're just doing the answer he might want us to think in our heads how you might do it or how you might show your working if you were doing, showing your working.

Then later on,

R: Why don't you need to ask questions?

E: Maybe because (15) sometimes it might be easy, or when it hard I mostly ask questions when it's hard because sometimes he asks the question like how do we show our working then he wants me, then he checks with me, and I get how to show my working.

These examples show that Essie is capable of trying to work things out for herself but knows she can ask the teacher if she is not able to do so. Andy's strategies are notably different as can be seen in this example.

R: If you don't know how to do something, what would you normally do?

A: (10) Try to think about it?

R: What do you think Karen would like you to do when you're finding something a bit hard on the mat there? What do you think she'd want you to do?

A: Sit up?

R: Sit up, yeah ... is there anything else that she might want you to do?

A: Cross my legs?

R: Mmm, anything else?

A: ((shrugged shoulders))

Evan had a high number of strategies overall, but most of these were in the procedural category. The following example illustrates Evan's perception that following rules and procedures is very important at maths time.

R: What do you think the teacher wants you to do when you're finding the work a bit hard?

E: Maths corner ((very quick answer))

R: Just go to the maths corner?

E: Yeah, cos she always tells that.

R: She always tells you what?

E: She always tells us to go to the maths corner.

In Evan's view it was more important to go to the maths corner and occupy himself quietly, than to try and solve a maths problem, or ask the teacher for help.

The findings concerning learning strategies which emerged from the student interviews were unexpected but show quite clearly that the more able students can talk about a greater range of specific learning strategies than the less able students. Where less able students have a high number of strategies, these are mainly concerned with behaviour and classroom procedures.

4.9 Summary

Findings from three methods of data collection have been presented including relevant extracts from both teacher and student interviews. The initial and major source of data came from the structured classroom observations and this revealed that the cultural background of students and teachers was not a factor in determining the frequency or nature of student initiated interactions during maths lessons. These findings influenced the focus of the teacher interviews, which then provoked questions for the student interviews. The teachers' responses indicated that for the most part, they believed that factors other than cultural background were significant in determining the nature and frequency of student interactions in the classroom. The

factors they identified were generally situated with the students, for example personality and family background. There was awareness from most teachers of the notion of 'cultural capital' and its impact on classroom teaching and learning, but there was considerable variation in terms of the level of significance this was afforded. Responses from the student interviews revealed various and interesting perceptions about the importance of having a teacher from the same cultural background. The Tongan students with the Tongan teacher clearly valued having a teacher from the same cultural background, whereas the other students did not necessarily see this as important. Differences in the range and type of learning strategies students could explicate was evident and tended to be linked with ability in mathematics.

The significance and meanings of these findings will be discussed in the next chapter along with possible implications for teachers and teacher educators.

CHAPTER 5

DISCUSSION OF FINDINGS

5.1 Introduction

The research questions for this study required an investigation of the extent to which cultural background of teachers and students played a role in determining the frequency and function of student initiated interactions. A simple analysis of the quantitative data obtained from the classroom observations could provide seemingly straightforward answers to these questions. However, researchers “need to recognize the institutional values, social relations and the unequal distribution of power which permeate the context of the classroom” (Black, 2004:348). Indeed, the findings which have been presented provide evidence that it is important to look beyond the surface features of classroom discourse because it is here that such values, relationships, and power differences are revealed. This chapter then, will discuss the quantitative data in light of the qualitative data, in order to facilitate a better understanding of teacher pupil interactions. The findings will be discussed under the following headings:

- 5.1 Frequency of student initiated interactions
- 5.2 Teacher variation and student initiated interaction
- 5.3 Language functions of student initiated interactions
- 5.4 Awareness of ‘cultural capital’

5.2 Frequency of student initiated interactions

The fact that student initiated interactions comprised a small fraction of the discourse moves occurring during the observations was axiomatic at the outset of the study. One 18 minute lesson in Bill’s class for example, yielded only two such utterances. Previous studies have also noted that students rarely structure their own utterances and are primarily positioned in a responsive role (Breen, 2001c; Politzer, Ramirez, & Lewis, 1981). Teachers indicated dissatisfaction and sometimes surprise at the low level student initiated interaction occurring in their lessons. Findings from the current study confirm that, “learners are not actually required to do much overt or explicit

discursive work while devoting their discursive energies to keeping track of the teacher's text and being alert to the moments when they have to contribute to it and to the teacher's reactions to their contributions" (Breen 2001c:310).

Despite the primarily responsive nature of student discourse, there were sufficient student initiated utterances to provide data for analysis and the discussion which follows.

Data from the classroom observations revealed that the cultural background of teachers and students was not a factor in determining the frequency or nature of student initiated interactions. Neither did the data show that students were more likely to be more successful in mathematics if they were with a teacher from the same cultural background. Other recent studies which have investigated the relationships between Maori and Pasifika students and their teachers, have also concluded that there is no correlation between ethnicity and effectiveness (see Hawk, Tumama Cowley, Hill, & Sutherland, 2002). When teachers were interviewed they talked about the importance of relationships with students being of paramount importance. Even Mele, the Tongan teacher who had a class of Tongan children, explained that teachers who took a genuine interest in the backgrounds of their students, regardless of culture, would be able to relate effectively with them.

Another finding which emerged from analyzing the frequency of student initiated interactions was that high levels of initiating did not necessarily correlate with success in mathematics. This reinforces Breen's assertion that "overt discursive pressure upon particular learners or even spontaneous participation do not alone account for differences in what learners learn in a lesson"(Breen, 2001c:313), and also Ely's findings that overt learner participation was not linked to test attainment (cited in Breen, 2001c). In the current study, the children who were the most frequent initiators often appeared to comprehend the mathematics concepts during the oral interactions with the teacher in the small group teaching situations, however they were not always able complete the independent follow up tasks successfully. Ely (1986) and Meaney (2002) suggest that this could be because different cognitive skills are involved in the two tasks. It may be important then, for teachers to spend time practising the skills required to complete the follow up independent tasks. In addition, during the classroom observations it was noticed that teachers only

sporadically returned to groups working on these tasks, and that when they did, most of the time they checked that the students were on task, but not that they actually understood the task. Teachers should not assume that students who appear confident in oral situations will automatically be able to transfer their understanding to written tasks even if they involve the same concepts.

Just as high levels of initiation did not correlate with successful completion of maths tasks, so too low levels of initiation did not correlate with failure to complete maths tasks. It was clear when interviewing Essie, a successful student who seldom initiated, that she didn't feel the need to ask many questions because she readily understood the concepts. When she did experience difficulty, analysis of her interview responses revealed that she was able to draw on a number of specific learning strategies to solve problems. It may be that some of the successful yet quieter learners deliberately avoid discursive pressure so that they can devote their attention to their own learning agendas (Breen, 2001c).

Of the 18 children in the study, only eight were considered to achieve high levels of success with the maths tasks observed. The remaining ten children still had gaps in their understanding, and for some these were significant gaps. Of concern is the fact that the three least successful students were not frequent initiators of interaction. These three were all Pacific Island students. In their interviews, teachers explained that they knew who these less able children were, and it was clear that they made efforts to provide extra support for them. However, some children continue to experience difficulty and teachers, constrained by demands of an overcrowded curriculum and trying to meet the needs of large numbers of students, have only limited time to spend with each student. In all classrooms there are physical and institutional constraints that tend to minimize the possibilities for meaningful interaction between teachers and students (van Lier, 2001).

It was clear from their interviews that the least able students were able to deploy fewer specific learning strategies to help them when they were experiencing difficulty. These findings confirm those of previous research which has shown that low achieving students can attend to procedural matters such as neatness and compliance, but not curriculum learning (Bennett & Desforbes, 1985; Bennett,

Desforges & Cockburn, 1984, cited in Alton-Lee, 2003). Rita who is Tongan and in Mele's class is clearly focused on procedural matters. When asked what she had to remember when working in her maths group her responses included

Listen to the teacher, get out our book and pencil, write something that she told us to do, colour it in and do the things that underline.

When asked what would you do if you don't know how to do something after a long pause she responded

I don't know.

It is important then, that students like Rita are taught specific strategies for what to do when they don't know what to do, and that these include asking questions to clarify understanding of mathematical content. Alton-Lee (2003:81) states that it is vital to teach all students metacognitive (learning to learn) strategies and that these are particularly enabling for diverse learners "whose home experiences have emphasized a compliance culture of some kind." It was apparent that some of the high achieving students in the study already use metacognitive strategies. The following extract from Essie's interview is an example.

R: What do you think the teacher wants you to do when you find the work a bit hard?

E: Maybe if we're just doing the answer he might want us to think in our heads how you might do it, or how you might show your working if you were doing – showing your working.

Essie's reference to *think in our heads* is a clear indication that she uses metacognitive strategies. Unfortunately, some of the students of concern in the current study do not appear to be using metacognitive strategies, and these are ones whose home backgrounds may foster the 'compliance culture' that Alton-Lee (2003) talks about. Ely (1986) asserts that these students also need to be made to feel more psychologically comfortable and safe in their learning environments before they can be expected to take linguistic risks.

5.3 Teacher variation and student initiated interaction

In the previous section it was noted that the ethnicity of the teacher did not correlate with effectiveness. Results from the classroom observations did however indicate tentative relationships between some teacher characteristics and frequency of student-

initiated interactions and acknowledgements. These relationships are described here as tendencies rather than correlations as there is insufficient evidence to make claims for the latter. However, they may be worth further investigation.

The two teachers who had the highest level of student initiations, Karen and Mele, were more experienced than the two with lower levels, Bill and Jose. Classroom observations and interview responses provided evidence that the less experienced teachers were more focused on management procedures and following lesson sequences than the more experienced teachers. Alton-Lee (2003:61) suggests that “classroom management practices focused on discipline, compliance, presentation of work and quiet engagement may actually counter the kinds of opportunities that facilitate sustained learning.” Teachers, particularly those who are in the early stages of their careers, may concern themselves with managing the class at the expense of allowing exploratory talk to flourish. Accordingly Breen (2001c:315) maintains that teachers and learners experience “discoursal dilemmas” because they have to maintain social harmony and avoid social problems while preserving pedagogic possibilities or genuine opportunities for learning. The following interview extract is from Evan in Jose’s class and is a poignant example of when the need [perceived or real] to maintain this social harmony conflicts with the need to pursue learning opportunities.

R: But what about the teacher, like why don’t you ask the teacher – do you ask the teacher many questions at maths time?

E: ((shook his head))

R: Why not?

E: Cos she hates, cos she hates it.

R: She hates that, how do you know she hates that?

E: Cos she’s doing the Arts Extravaganza.

R: Oh she’s busy with Arts Extravaganza. Even when it’s maths time, doesn’t she like you to ask a question?

E: Yeah, every time.

R: Every time.

E: Yeah.

It is important to note when reading the above extract that Evan is an extremely well behaved and compliant student and was one of the least frequent initiators. He is the type of learner Breen (2001c:317) describes as being highly attentive to avoiding

trouble by successfully navigating the prevailing discourse of language lessons which might distract his attention from actually learning something. Interview extracts from Evan's teacher Jose, which were presented in the previous chapter, show that she is aware that students *feel scared to ask*, but is at a loss to know how to alleviate this problem and maintain a classroom that functions 'smoothly' for the benefit of all students. Both Bill and Jose indicated a desire to provide more opportunity for all students to initiate interaction in their classrooms, but were frustrated by the lack of time available for such opportunities. Similarly, Black (2004) found that lack of time forced teachers to progress quickly with curriculum and to maintain control over discussions in order to do so. It may be that beginning teachers (those in their first two years of teaching) in particular, feel these pressures.

One other variation between teachers will be discussed in this section and that is the differences in the rate at which teachers acknowledged the student initiated interactions. Mele, the Tongan teacher, acknowledged her students, all Tongan, more often than the New Zealand European teachers acknowledged their students. As was stated in the previous chapter, Mele was aware of acknowledging her students often and made a conscious effort to do so. The quantitative data from this study does not show that students in Mele's class are more successful with maths tasks than Pacific Island students who with New Zealand European teachers and it has been stated above that there is no correlation between teacher ethnicity and teacher effectiveness. However, interview extracts presented in the previous chapter, reveal that Mele and her students share a unique bond. Mele's high rate of acknowledging students could be a tangible indicator of that bond or relationship. 'Connectedness' between students and their teachers has been identified as important in other recent studies investigating teacher / student relationships for Pasifika students (see Hawk et al., 2002). In order to ascertain whether the high level of acknowledgement and 'connectedness' which tended to be more evident between Mele and her students, than between the New Zealand European teachers and their students, makes a difference to learning opportunities and outcomes, further research of a longitudinal nature is required.

5.4 Language functions of student initiated interactions

The most frequent language function students used when initiating was to provide an answer or display knowledge. Initially, the researcher was surprised at this finding, assuming that maths lessons would have provided opportunities for children to ask questions about what they were learning, and request clarification when they didn't understand. However, close analysis of the teachers' interview responses yielded a possible explanation for this finding. When asked about the rules, procedures, and guidelines teachers expected students to adhere to during maths lessons, it became clear that almost all of the responses they gave related to what students should do when they did know the answer, but very few responses related to what students should do when they didn't know the answer. When analyzing the quantitative data pertaining to language functions in light of the teacher interviews, it was no longer surprising that when students did initiate an interaction it was to provide an answer. Teachers, after all, had been very explicit about the importance of giving answers. They were not, for the most part, explicit about how or when to ask questions.

All students have beliefs about what to do in school in order to learn (Lampert et.al, 1996) and clearly the students observed in this study believe that providing answers is the appropriate and acceptable mode of behaviour during maths lessons. Students believe that teachers want them to give answers, not ask questions. Lampert et al (1996:759) offers this explanation of why students find it difficult to adopt discursive practices different to those they believe to be most appropriate in the classroom.

The school classroom is a place where friends are made and lost, where identity is developed, where pride and shame and caring and hurting happens to kids.

The importance of identity is also emphasized by Toohey (1998) who argues that in stratified communities such as classrooms some students become defined as deficient and are then excluded from the very practices which may assist them to grow in competence and expertise. If we acknowledge that classrooms are communities "whose practices contribute to constructing children as individuals" (Toohey, 1998:81) then we should not be surprised when students do take the risk of initiating an interaction, it will be to display their knowledge. By so doing they are being

constructed as knowledgeable and competent. After all, children do not easily separate the quality of ideas from the person expressing them (Olson & Astington, 1993 cited in Lampert, Rittenhouse, & Crumbaugh, 1996:740). As Miller (2000:72) precisely states “what seems inescapable is the understanding that our identities are shaped by and through our use of language.”

The challenge for teachers then, is to create communities where language functions such as asking questions, requesting clarification, disagreeing, and giving opinions, become as acceptable as providing answers. It is important that linguistic minority students achieve self-representation in the dominant language in order to be able to participate in mainstream social and academic situations (Miller, 2000). The management of safe participation and avoidance of practices which shame or humiliate students will be of paramount importance (Alton-Lee, 2003). In this type of learning community students should be enabled to express and process dissenting views, and disagreements around curriculum should be valued (Alton-Lee, 2003). One way of beginning to create such a community is for teachers to be explicit about what they expect from students. Data from the current study suggests that teachers need to be more explicit about what students should do when they don't know what to do, in mathematics lessons. Furthermore asking a good question, should be encouraged by teachers and given the same if not higher praise than giving a correct answer.

5.5 Awareness of ‘cultural capital’

At the end of the literature review it was stated that the aim of this study was to increase our “understanding, both holistically and in the smallest details, of the social setting as a complex adaptive system”(van Lier, 2001). As Miller (2000:70) asserts, “we cannot ignore social and ideological concerns when assessing language acquisition and use”. Talking with teachers about their understandings and beliefs to do with culture and its impact on what happens in classrooms enabled the researcher to gain insight into some of the social and ideological forces which contribute to shaping classroom discourse. Interviews with students provided insight into their beliefs or ‘folk learning theories’ (Lampert et al., 1996) about what to do at school in

order to learn and these insights were also helpful in understanding who gets to talk and why. This type of analysis is important because it

reveals underlying processes of unequal pupil participation within classroom interactions which will need to be challenged if ‘interactive whole class teaching’ is to promote effective learning for all (Black, 2004:348).

Each of the teachers interviewed indicated that the questions about culture were thought provoking and they often found it difficult to put their thoughts into words. However, when they did it was clear that there were noticeable differences in teachers’ awareness of the notion of ‘cultural capital’. To reiterate, this term refers to “the storehouse of experiences, knowledge, and attitudes a child can capitalise on when going to school, given the practices of schooling” (Nash 1993, cited in McNaughton, 2002:21). Barnard (1998:4) explains what this means in reality for students and teachers:

there are many conventions operating in our schools which mean that teaching and learning activities, while superficially similar to those in other cultures, derive from profoundly different values and beliefs.

Bill, one of the New Zealand European beginning teachers, placed very little emphasis on the significance of culture in the children’s learning. He actually stated that *once second language learners have begun to interact in the playground then they’re fine*. He gave no indication that he was aware that educational and behavioural expectations for all students have been interpreted and are represented in terms of the Western European education system (Berryman, Walker, Rewiti, O’Brien, & Weiss, 2000). Conversely Mele, the more experienced Tongan teacher, was acutely aware of the impact the majority culture education can have on minority group students.

With these disparities in mind, the question must be asked whether or not it makes a difference to students if teachers are aware of this notion of ‘cultural capital’. There is insufficient data from the current study to attempt to answer such a question. Bill had the lowest level of student initiations during his lessons, but this occurred with his New Zealand European students and his Samoan student. Mele had the highest level of initiations, but some of her Tongan students barely spoke at all. Some studies have found that effective teachers did need to demonstrate empathy with Maori and

Pasifika cultures (see Hawk et al., 2002), however further research is required to investigate whether or not there is a link between teachers' levels of awareness of 'cultural capital' and their effectiveness with students from diverse backgrounds.

Of some concern is the fact that the two teachers with lowest levels of awareness of 'cultural capital' are both in their second year of teaching. With the knowledge that in our schools today students are more likely to be taught by someone from a different culture to their own (Hawk et al., 2002) it might be expected that teacher training programmes would place emphasis on the need to be aware of the notion of 'cultural capital'. This may be a naive assumption as, in a recent Te Puni Kokiri draft consultation document, it is stated that there has been "criticism that teacher education is failing to respond adequately to an increasingly diverse population" (Te Puni Kokiri, 2004:1). The interview responses from the recent teacher graduates in the current study would seem to support this criticism. The teachers interviewed in this study, who at times struggled to identify their own cultural values and beliefs, and yet were willing to reflect on how their own practices could impact on their teaching, would no doubt welcome the opportunity to investigate their own cultures in more depth. Initial teacher education needs to challenge teachers to inquire into their own culture so that they can understand and value the social and cultural contexts of their students (Te Puni Kokiri, 2004). Moreover, teachers should be aware that there is a need for systematic induction into New Zealand's learning culture for students from minority groups (Barnard, 1998). For students like Evan, who are so focused on compliance, often at the expense of learning, such an induction may offer the space for him to become an inquiring and participating student. For, as Lave and Wenger (1991, cited in Norton, 2001:159) explain, "we not only produce our identities through the practices we engage in, but we also define ourselves through the practices we do not engage in."

5.6 Summary

This discussion has offered insights into some of the things that shaped the discourse in the mathematics lessons observed. First of all, it was noted that there was little student initiated interaction happening between students and their teachers; students

spend most of their time in a responsive role. It was suggested that this was in part due to the routine structure of lessons derived from “the culturally understood rights and obligations of classroom participants” (Cazden & Beck, 2003:172). When students did initiate interaction, most often they did so to provide answers and display knowledge. An analysis of the interview responses revealed that this was not surprising as teachers’ explicit instructions to students during mathematics usually pertained to how to give answers, rather than how to ask questions.

The notion that student identity is shaped through discourse was explored and this also offered explanation of why students wanted to display what they did know, by answering questions rather than what they didn’t know, by asking questions.

Another factor which shaped the discourse was teachers’ feelings of frustration due to lack of time to cover the content of an overcrowded curriculum and spend time with all of their students. This led them to maintain control over the discussions which took place. It was suggested that beginning teachers in particular, may feel pressured by these constraints.

The evidence did not suggest that students who initiated more often were more successful in their mathematics learning. Similarly, some students who did not initiate often did achieve success. There did however, seem to be a link between students’ ability to draw on a range of cognitive and metacognitive learning strategies and successful completion of maths tasks.

It was noted that teachers varied considerably in their understanding and awareness of ‘cultural capital’ and that this area warrants further investigation because as Gibbons (2003:249) states

there is considerable linguistic and conceptual distance between teacher and students, especially when they do not share the same language, assumptions, and life experiences.

If we return to the research questions, it seems that a common cultural background between students and teachers does not influence the frequency or nature student initiated interactions. That there is not a clear link between the two should not be

surprising – Breen (2001a) cautions that we must question the extent to which surface features of classroom discourse can reveal the underlying social and psychological forces which generate it. Findings from the current study confirm that beneath the surface lies a myriad of social, cultural, and psychological influences which contribute to the nature of the discourse and the positioning of the participants.

CHAPTER 6

CONCLUSION

6.1 Summary

There is no doubt that interaction between students and teachers is important. As Gibbons (2003:247) states, “in interactions that are effective in terms of L2 development, both teachers and learners are active participants in the co-construction of language and curriculum knowledge.” It may be that whether or not students initiate the interaction is a minor issue. It may also be that students who are not overtly engaging in the interaction is a minor issue. Furthermore, it may be that whether or not teachers and students come from the same cultural background is also a minor issue. Some children navigate the discourse of lessons in a way that ensures they achieve success in their learning and this may or may not mean that they are taking an active speaking role in the interaction. What is of concern is that there are students who, despite their attempts to participate in discourse in ways which they believe to be appropriate, continue to fail to capitalize on the learning opportunities available to them. They have not appropriated voices that enable them to learn.

Students such as Evan and Rita believe that their role in classroom discourse is to respond to teachers’ questions, and provide them with the answers they require. Data from the current study would suggest that the culture of discourse during maths lessons is one in which students are not encouraged to initiate, question, disagree, or offer opinions. Wertsch (cited in Toohey, 2000) argues that the customary arrangement of speech acts in classrooms serves to maintain the teacher as the locus of power and authority, which is congruent with arrangements in other arenas. These discourse patterns function to show some students, such as Rita and Evan, as unable and subordinated (Toohey, 2000). This being the case, some learners still manage to achieve success. They are the ones who are able to draw on cognitive and metacognitive strategies which enable them to work independently to solve problems, but still know how and when to ask for help when necessary. These students have appropriated voices which do enable them to learn.

The ability to work and solve problems independently is of paramount importance because teachers are busy and no matter how hard they try they will not be able to help individual students every time they need it. The constraints teachers work within contribute to the way they control and manage discourse, including the messages – both explicit and implicit – they give their students. They are explicit about how to respond to questions and provide answers but less clear about how and when to ask questions and indicate misunderstanding. Whilst they would like students to ask more questions, initiate interaction more often, and engage in exploratory talk, teachers unintentionally encourage them to give answers, complete work quickly and efficiently, and go about their business with as little disruption as possible to classroom routines.

Teachers are aware of ‘culturally determined learning styles’ of Pacific Island students, and to a lesser degree New Zealand European students, but stress that they believe students do not always display these. They are aware then, that “a focus on generalized cultural differences can detract from the close observation of individual learners” (Cazden, 2001:137). There is considerable variation between teachers with regard to their understanding and awareness of ‘cultural capital’ and whilst the students in the Tongan Emphasis class seemed to share a special bond with their Tongan teacher it is beyond the realms of the current study to suggest whether or not this bond is significant in terms of learning outcomes for children. It may be that current measures available are not able to capture the more subtle but significant engagement of students.

6.2 Significance of findings

The findings from this study are particularly relevant today as teachers and researchers strive to close the gap between achievers and non-achievers in our education system. As (Hattie, 2003:7) states, although many of the non-achievers are Maori and Pacific Islanders we must not see them as the problem – “we must invest in improving the chances of these students now, or we will need to spend more later to place more ambulances at the bottom of the cliff”. Findings from the current study would suggest that teaching specific cognitive and metacognitive strategies to all

students is one way to support them. Being explicit about the culture of the classroom is also important as this in itself is a new learning experience for students from diverse communities (Alton-Lee, 2003; Barnard, 1998).

Current thinking and research in mathematics teaching places emphasis on oral communication (Black, 2004; Meaney, 2002) and findings from the current study would suggest that indeed the talk that occurs during maths lessons is important. Specifically, emphasis should be afforded to creating a classroom culture in which asking questions is valued as much as providing correct answers.

Findings from this study confirm the sociocultural nature of second language learning and support findings such as Miller's who states that in order for schools to attend more effectively to the identities of students from diverse backgrounds "they must first understand the dynamic interrelations of institutional contexts, language resources, and social identities" (Miller, 2000:69). Gibbons's (2003) research also supports this notion. She emphasizes the importance of paying attention to the nature of discourse that occurs between students and teachers in all curriculum areas.

6.3 Limitations and suggestions for further research

The findings of the current study must be interpreted in light of several limitations. Understanding these limitations has signaled areas where further research could be useful.

Data collection for the project was carried out over the course of three school terms, approximately six months. There were only two observations in each classroom and the teachers and a selected group of students, were interviewed once. This study sought to investigate the social, cultural, and ideological forces that shape classroom discourse, to provide a "richer and less prescriptive account of classroom language learning" (Breen, 2001a:125) than some other accounts of classroom discourse. As such, it would have been beneficial to obtain more data over a longer period of time. It would therefore be useful for future research to take a more anthropological approach to investigating classroom discourse because "the language class is a genuine culture worth investigating as such" (Breen, 2001a:128).

The major source of data from the study was derived from the classroom observations which were audio taped. Although the researcher was present making notes during the observations, it is likely some non-verbal actions and interactions which could have contributed to understanding the discourse, were not recorded. Classroom research constitutes tension between the need to gather accurate and useful data, and the need to remain as unobtrusive as possible. Researchers interested in pursuing projects investigating classroom discourse need to consider carefully the implications of their chosen methods of data collection.

Pacific Island and New Zealand European students, along with one Tongan, and three New Zealand European teachers participated in this research project. Due to the composition of the classes in the study, it was not possible to observe New Zealand European students with Pacific Island teachers. Future research in classroom discourse should investigate interactions between a range of teachers and children from different cultures because our schools provide, for increasing numbers of students, their first experience of intercultural contact. It is important to investigate what happens when this contact occurs to ensure that classroom discourse offers speaking parts for all (Cazden, 2001).

Educators continue to search for the most effective learning environments and teaching methodologies for minority group students. Bilingual and biliteracy programmes have proven to be successful for some students (McCaffery et al., 2003), but unfortunately the reality for many students who speak a minority language or who come from a minority culture is that this option is not available for them. Some schools are able to offer 'cultural emphasis' classes such as the Tongan class in the current study where it was clear that the students and teachers shared a unique bond. More research needs to be conducted in these types of classroom settings to investigate the long term effects they have for students and families. Such research should investigate outcomes of a social and cultural nature as well as the more readily measurable academic outcomes.

6.4 Pedagogical Implications

Van Lier (2001) argues that the answer to the disproportionate amount of teacher controlled talk is not to try to minimize it but to find ways to modify it in more contingent directions. This is important because unless we break away from traditional patterns of talk children will be restrained from developing voice (Toohey, 2000). It is important for students to develop their own voices, so that they can be in positions of power and autonomy in their discourse communities, as this will enable them to become active participants in language communities (Toohey, 2000) thereby enabling them to capitalize on the learning opportunities available to them. Teachers also need to find new voices and ways that will allow them to be in conversations with children where they are not always dominant. It is the responsibility of education policy and decision makers to find ways to support teachers to do this. This has implications for class size, curriculum content, and assessment practices. Teachers are so focused on student outcomes to meet assessment requirements in so many curriculum areas, that there is not enough time for exploratory talk to flourish. Particular attention should be given to supporting beginning teachers who understandably focus on curriculum and management issues, and are less likely than more experienced teachers to take the risk of relinquishing absolute control and direction in learning conversations with their students.

As well as searching for alternative ways to structure discourse to allow students and teachers to appropriate a variety of voices, it is important that teachers pay attention to teaching specific cognitive and metacognitive strategies to all students. Alton-Lee (2003) confirms that subject-specific metacognitive strategies help provide students with specific and structured approaches of frameworks for learning. In mathematics, it is not enough for students to *try hard* or *underline and colour in nicely* as Evan and Rita explain. These students need to know specifically how to *think it in your head* as Essie was able to do. Furthermore, teachers must keep in mind the fact that some students may manage hands on and oral tasks well, appearing to understand concepts, but this does not always transfer to written tasks which require different skills. Teacher training providers need to ensure that trainees are aware of how to teach a range of cognitive and metacognitive strategies, and teachers need to undertake

professional development on a regular basis to ensure they continue to improve their knowledge and understanding of this important area.

In addition, teachers in all curriculum areas, including mathematics, need to be aware of the significance of language. Teacher training providers need to ensure that content area teachers understand how to teach the language required for their subject along with the language skills required to learn in their subject.

Attention needs to be afforded to the learning culture of the classroom, not least because “classrooms are places of increasing intercultural contact” (Cazden & Beck, 2003:189). Teachers need to make sure that students know that they are not always expected to be in the responsive role and that there are times when it is appropriate to use language functions such as questioning, disagreeing, giving opinions, and asking for clarification. It is not enough to simply to tell the students this, particularly when working with those whose home backgrounds manifest a ‘compliance culture’ (Alton-Lee, 2003). Teachers need to model and explicitly teach the types of language functions which will enable learners to take a more active and constructive role in classroom talk. This is important in mathematics where it is vital for students to understand new concepts before moving on to more complex ones, but also in other areas of the curriculum. Students need to know that asking a good question is as important as providing a correct answer. The intention of the curriculum is after all, to promote learning (Aulls, 1998). In her classic study with white teachers and black students in the United States, Heath (1982 cited in Cazden & Beck, 2003) helped teachers to work towards creating new patterns of classroom interaction and explicit teaching of the forms of discourse they expected in their classrooms. The teachers not only learnt from Heath’s research, but importantly they learned for and about themselves through their own research. These teachers’ recommendations can still offer much for teachers today. They include: begin talking with children in ways that they are familiar with; go on to new kinds of talk but with familiar content; provide models of unfamiliar talk for children; provide practice opportunities for new kinds of talk; and finally, talk with children about talk itself (Heath, 1982 cited in Cazden & Beck, 2003).

Just as the teachers in Heath's study were prepared to take on the role of researcher, and investigate ways of changing the discourse patterns in their classrooms, those in the current study were reflective and genuinely motivated to search for better ways of helping students learn. If they are to be afforded opportunities to be the teacher-researchers many in the fields of both second language acquisition and education now advocate as the most effective professional development available (Allwright & Bailey, 1991; Loughran, Mitchell, & Mitchell, 2002; van Lier, 2001) then decision and policy makers in education need to consider ways to make carrying out teacher research viable and practical. This will involve release time, and both financial and academic support. The thoughtful teacher-researcher looks for ways to make classroom interaction varied and multidimensional (van Lier, 2001) and their own findings and conclusions will have far more impact on their teaching, than those of any academic researcher.

6.4 Concluding Comment

All teachers face the issue of the relationship between the unifying national culture of New Zealand and the different cultures of the diverse groups, such as groups unified by disability, by ethnicity, or by the common experience of being people with abilities. (Rata et al., 2001:192)

Teachers and learners want to be successful in their teaching and learning. Each arrives in the classroom with a lifetime of experiences which predispose them to be who they are and behave as they do. The experiences they have during their time at school continue to shape the way they interact and the voices they appropriate. We must look beyond the surface of children's talk and our own talk to ensure that what we say and do is motivated by a desire to empower all children to learn and balance this with the need to maintain harmony in the classroom.

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LIST OF APPENDICES

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Appendix A: Classroom Observation Schedule

Date

Time

Teacher

Students

<u>Notes to set the scene</u>	<u>Seating arrangement</u>
Time lesson begins:	

S1	S2	S3	S4	T

Appendix B: Transcription conventions

Symbol	Meaning	Example
?	Questioning intonation	How are you going to do that?
!	Excl/Emph utterance	Oh!
(2.0)	Pause of about 2 seconds	That's alright (2.0). Have you got six ones there?
(...)	Pause of about 1 second	Mele (...) Mele (...) I've finished.
[]	Overlap	A: That's 10, 11, 12, [13], 14 B: [done]
=	Latched utterances	A: If you're not sure what to do = B: = I got 20
(xxx)	Unable to transcribe	A: Oh the eight was (xxx)
_____	emphasis	It <u>is</u> 66.
:	Sound stretching	O::::::h
(())	Other details	T: Oh yeah, you ((gave the number line))
-	Abrupt cut off	One – oh it's a hundred and ten.
CAPS	Louder than surrounding talk.	DAN I'll explain in Tongan to you.
“”	Tongan spoken	Rita, “fa mo e fiha ‘o ma’u ai ‘ae fitu?”
{ }	The English translation of Tongan, not actually spoken.	“fanongo” {listen}

Appendix C: Interview guide for teachers

As you know, one of the aims of this research has been to find out what students do, when they don't know what to do in maths lessons. Ideally, what would you like to see happening when this occurs?

What guidelines / rules / procedures (if any) do you have surrounding talk and discussion during maths lessons. How do you make sure that the children know about these?

In general, how often do you think students initiate interaction with you during maths (e.g. ask you a question, give you an instruction, tell you about something unprompted)?

Do you find some students talk with you more often than others? Why might this be? Can you think of an example?

Why do you think students might initiate interaction with you in a maths lesson?

Do you think children would be more comfortable initiating interaction with a teacher, if the teacher was from the same culture as him/her? Why, why not?

Do you think any of your own cultural practices and beliefs impact on the way you teach and interact with students in your classroom? Explain.

Tell me what you understand about cultural values and practices of people from the Pacific Islands such as Tonga, Niue, Samoa, and the Cook Islands that might have an impact on how these students behave and learn in the classroom.

Tell me what you know about cultural practices of NZ European people that might have an impact on how these students behave and learn in the classroom.

Do you think students who come from minority cultures have the same opportunities to interact in New Zealand mainstream classrooms, as NZ European students? Why or why not?

I will give you a summary of findings from your lessons during the interview.

[Each teacher has specific questions pertaining to their students]

In light of what we have talked about today, is there anything you will continue to reflect on?

Appendix D: Questions for semi-structured interviews with students

Tell me about where you and your family come from.

When someone asks you what country you come from, what do you say? Why?

Do you know what country _____ (teacher) comes from?

Would you (do you) like having a teacher from the same country as you? Why or why not?

Who looks after you at home? Does _____ (mum, dad, aunty, grandpa etc) tell you how to behave at school?

(If yes) What do they say?

Does _____ (mum, dad, aunty, grandpa etc) tell you about talking and asking questions in the classroom?

(If yes) What do they say?

Now I want you to think about when you are doing maths in your group, and you are sitting on the mat and _____ (teacher) is doing some work with you.

Are there any rules that you have to remember when you are in this group?

(If yes) What are they?

If you know an answer, or you *can* do something, what do you normally do?

If you don't know how to do something, what do you normally do?

Is maths easy or hard for you?

Why?

Now I want you to think about when you are doing a maths activity on your own (like a worksheet), and the teacher is not working with your group.

Are there any rules that you have to remember when you are doing this work?

(If yes) What are they?

If you can't do the activity, or some of it is a bit hard, what do you normally do?

What do you think the teacher wants you to do, when you find the work a bit hard?

Do you ask many questions at maths time? Why/ why not?

Appendix E: Information sheet for Principal, Board of Trustees, and Teachers

Research Project “Silence speaks volumes”

Researcher: Maree Jeurissen

What is the purpose of the study?

I will be investigating whether or not students interact differently if they are with a teacher who shares their cultural background, or with a teacher who comes from a different cultural background. I will use the study to complete a thesis for a Masters in Applied Language Studies at Auckland University of Technology.

How are people chosen to be asked to be part of the study?

Each child is chosen in consultation with the class teacher because he/she is representative of a cultural group I wish to observe.

What happens in the study?

Children will be observed doing everyday classroom work over a period of one or two weeks. Some small group lessons will be tape recorded and I will take notes about what happens. I will also hold one informal half hour interview with selected children, either individually or in groups. Each teacher will be interviewed once for about one hour.

What are the benefits ?

The results of this study could provide information to teachers about how to improve their interactions with students from various cultural backgrounds, to ensure all students have equal opportunities to learn in classrooms.

How will the privacy of research participants be protected?

At no time will children, teachers, or the school be able to be identified by anyone other than myself. All participants will remain anonymous in any output from the research. All documents and data will be stored securely at AUT.

Are there any costs involved?

There will be no financial costs to any of the participants. There will be one half hour interview, which will be held some time during the school day.

Opportunity to receive feedback on results of research

At the completion of the study, children and the participating teachers will be invited to an informal gathering where I will give a short oral presentation of the findings. I will also offer to give an oral report to the Board of Trustees. A written report will be made available.

Participant Concerns

Any concerns regarding the nature of this project should be notified in the first instance to the Project Supervisor.

Concerns regarding the conduct of the research should be notified to the Executive Secretary, AUTECH, Madeline Banda, madeline.banda@aut.ac.nz , 917 9999 ext 8044.

Researcher Contact Details: Maree Jeurissen 623 8899 ext 8795, m.jeurissen@ace.ac.nz

Project Supervisor Contact Details: Dr John Bitchener 917 9999 ext 7830, john.bitchener@aut.ac.nz

Appendix F: Consent form for Board of Trustees

Consent to Participation in Research

Board of Trustees

Title of Project: **Silence speaks volumes**

Project Supervisor: **Dr John Bitchener**

Researcher: **Maree Jeurissen**

- We have read and understood the information provided about this research project.
- We have had an opportunity to ask questions and to have them answered.
- We understand that one half hour interview per group of students will be audio-taped and transcribed.
- We understand that one half hour interview per teacher will be audio-taped and transcribed.
- We understand that three classroom lessons will be audio-taped and transcribed.
- We agree to allow students and teachers at Edendale Primary School to take part in this research, with their consent.
- We wish to receive a copy of the report from the research YES NO (circle appropriate)

Board of Trustees Chairperson signature:

.....

Name : Date :

Principal signature:

Name: Date:

**Approved by the Auckland University of Technology Ethics Committee
on 8 March 2004 AUTEK Reference number 04/01**

Note: The Board of Trustees should retain a copy of this form.

Appendix G: Consent form for teachers

Consent to Participation in Research

Teachers

Title of Project: **Silence speaks volumes**

Project Supervisor: **Dr John Bitchener**

Researcher: **Maree Jeurissen**

- I have read and understood the information provided about this research project (Information Sheet dated 15 December 2003)
- I have had an opportunity to ask questions and to have them answered.
- I understand that one half hour interview will be audio-taped and transcribed.
- I understand that three classroom lessons will be audio-taped and transcribed.
- I understand that I may withdraw myself or any information that I have provided for this project at any time prior to completion of data collection, without being disadvantaged in any way.
- If I withdraw, I understand that all relevant tapes and transcripts, or parts thereof, will be destroyed.
- I agree to take part in this research.
- I wish to receive a copy of the report from the research YES NO (circle appropriate)

Participant signature:

Participant name:

Date:

**Approved by the Auckland University of Technology Ethics Committee
on 8 March 2004 AUTEK Reference number 04/01**

Note: The Participant should retain a copy of this form.

Appendix H: Student information sheet and consent form

Information sheet for students

29 April 2004

Dear

My name is Mrs Jeurissen and I would like to spend some time in your classroom watching you working so that I can find out more about how children learn best.

I am studying and I want to find out if children from different cultures learn differently from one another so that teachers can do their best for all students in the class.

I will need to watch about three lessons, and use a tape recorder so that later on I can write about what happens. I won't use your real name when I write, so no one will know I am writing about you! I would also like to ask you a few questions one day, to find out about some of the things that help you to learn.

If you are happy to take part, and mum and dad are happy too, then just sign your name below and give the form to your teacher. You don't have to take part if you don't want to. Just tell your teacher and no one will mind. If you need to ask any questions, tell your teacher and I will come to school and talk to you.

From

Mrs Jeurissen

Name _____ Signature _____

Parent/Caregiver name _____ Signature _____

Date _____

Appendix I: Example of transcribed lesson with notes

Teacher Mele **Date** 21 June 2004 **Time** 9.45am

Students Joseph, Dan M, Maxwell, Sammuel, Rita (Celia absent)

Duration of lesson recorded 29 minutes

Notes to set the scene

Whole class warm up activity all sitting on the mat. Teacher would show numbers, children had to name numbers, and then have to name what came before and what came after the number. The teacher was code switching between Tongan and English. The children were also given oral maths problems to solve. Finally they had to do come counting in tens using the 100s board. The teacher briefly gave instructions to each group and they went off to do their various activities. The triangles group came to work with the teacher on the mat. They were working with number and trying to solve problems like $17 + \underline{\quad} = 20$. They had to use counters for counting on, and also had white boards where the teacher would write individual problems for each child to solve.

Transcription of student initiated interactions

1. T: So how many, altogether have you got? ((to another child)) (...)10?
How many?
UI: 0 1 2 3 4 5 6 7 8 9 10
T: [Well done ((to UI))]
R: [ten?] ((response to a question several turns ago, and now the teacher not directing talk to her)) **PA**
T: So now we know that four and what makes 10? “4 moe fiha ‘o ma’u ai ‘ae hongofulu?” {four and what makes ten?}((nods to R, acknowledging utterance))
2. T: Now this time I’m going to get you to count (...) seven “fitu moe fiha ‘o ma’u ai ‘ae hongofulu?” {7 and what makes 10?} ((stopped mid-sentence to attend to a child from the class not in group giving instructions)) Show me, use the counters ((back to children in group)) “lau ‘ae fo’i fitu” {count to seven} Go, rule it off ((to another child not in group)) (3.0)
AM: You need three more Ooooh ((exasperated sigh)) **PA**
T: ((talking to another child, not acknowledging utterance)) Nine HUNDRED and fourteen. Which one is the tens?
3. AM: Three more to make ten Mele
UI: [three]
4. AM: [Oh] ((another exasperated sigh, thinking teacher not going to acknowledge again)) **EF**
T: You have to SHOW me, you can’t just guess it, you have to worked out how did you find it? ((now to AM))
AM: Oh I put it in my head
T: So and then you just count on?

- AM: Yeah
T: Well done so you said “fitu valu hiva hongofulu” {7 8 9 10} is that how you worked it out? Joseph? You just used your head?
5. T: No, don’t use your head, I want you to show me using the counters “5Ua” [2] , and then you count on. (2.0) What’s after “ua” {2} Maxwell? (4.0)
AL: Oh, 3,4, (2.0)
T: 5, 6
AL: 7, (...)
AM: You need 8 more to make 10 **PA**
6. T: ((nodded))
AM: 8 more to make 10 **PA**
T: Show me, where’s your 8 counters? ((then to another child)) You have to work it out on your own, Rita is right.
7. AM: You need 8 more to make 10
T: Well done, Joseph, you’re very clever, you’re very fast, now this time=
8. AM: (xxxxx) **EXPE**
T: You’ve been doing it at home
9. AM: There’s these cds that tells you about now maths take aways and=
EXPE
T: Ok now listen ((writes a number on board)) (...) What’s that number?
10. T: So what are you going to do, WHAT are you going to do? No no, don’t start, what, tell me what are you going to do Joseph?
Maxwell: Put four counters and then count on from 12 ((not his turn)) **PA**
T: Yes=
11. AM: 16,16, the answer is 16 ((overriding Maxwell))
T: Yes but I asked, you’re calling out the answer, I want you to SHOW me. Well done Maxwell, Maxwell just explained it to us, can you repeat yourself Maxwell?
12. T: So if you don’t understand you need to ASK. Do you understand what you’re supposed to do? “lau pe ko e fiha eni” {count how many are there}
D: 0Oh, I’m confused0 **AGC**
T: ((didn’t acknowledge – probably didn’t hear, straight away Joseph came in))
13. AM: Mele you need 8 more, 8 more to make 10. **PA**
T: Yeah but I haven’t seen your 8 in front of you. I haven’t seen that, you need to [show] me.
14. R: [20] **PA**
15. AM: Oh the 8 was (xxx) **PA**
T: No you haven’t shown me ((still to Joseph, not acknowledging R))
16. R: [I got 20]
T: Now I’m going to explain because some of you don’t understand, “fanongo” {listen} ((not acknowledging)) If you, if you’re not sure what to do=
17. R: I got 20 **PA**
T: “taha ua tolu fa nima ono fitu valu hiva” {1 2 3 4 5 6 7 8 9 }
18. AL: Hey Miss B **GA**

- T: She says she's got 20, can you all count after 12 now let's count
((acknowledging R, but not A))
19. T: So what's our answer?
SEVERAL: 20
T: It's supposed to be 20. [So how many has she got?]
AM: [You need 8 more, 8] PA
T: So how many=
20. AL: [Miss B, that's the 12 and that's the 8 more] PA
21. AM: [You need 8 more to make] Miss B you need 8 more to make (xxx) PA
T: Joseph, you are calling out, I know you are very good with that but you need to SHOW me. Let's all try it all together – LISTEN
22. T: So I'm going to count how many have we got all together.
SEVERAL: 1,2,3,4,5,6,7,8
T: We need [a lot of practice]
AL: [Miss B, that's the 12 and then I counted 8] PA
T: I didn't ask you to count the 12, you need to listen to my instructions.
“na'e 'ikai keu pehe atu keke lau a e tahau” {I didn't say for you to count the 12}
23. T: Do you understand ah, “ ‘oku mahino kia koe” {Do you understand} Dan.? So if you don't understand please ASK. “ ‘oua e ma” [don't be shy](2.0)
AM: I understand EU
T: Yeah I know you do, but you know you need to ASK.
“mahino?” {understand?} Let's write this one.
24. T: So how many counters have you got in there? ((to Rita))
R: [3]
AM: [you only need, you only need 4] PA
T: “Ko e ha e'?” {what's that?} How many counters have you got ((still to Rita))
25. T: Who can tell what's the answer here “Koe ha fika ko eni?” {what's the answer?}
R: 19
T: 19, so [you are going to count on]
AM: [You only need 4 more] PA
R: 18
T: Joseph you are calling out. Can you just wait and these and you have to show me and with your counters.
26. T: So you count on “Ko a'u pe ki he uanoa pea ke tu'u” {when you get to 20 stop} Show me. ((to Sammuel))
AL: 4 more? ((not his turn, T talking with Sammuel)) RC
T: (3.0) So how many more? ((not acknowledging AL))
S: (xxx)
T: I told you. You can do it now well done ah Sammuel.
27. AL: Miss B ((putting up hand and calling out not acknowledged)) GA
28. D: [Miss B don't know what to do] AGC

29. AM: [Mele] GA
 T: Shh, count on
30. D: Miss B I don't know ah oh ((noticing T busy looking at Maxwell)) AGC
 AL: 17 18 19 20?
 T: Well done Maxwell. Yes? ((to Dan))
 D: I don't know
 T: You don't understand. I'm glad you asked
31. T: ["Sio ki ai" {look}] GA
 AM: [Mele]
 T: Yes? ((to Joseph))
 AM: You need 4 more to make (xxx)
 T: Yes, now where, where's the four? You haven't shown me.
 T: "Sio ki he" {look at the counters} Dan, listen. If you have 16 and your answer is 20 and I'm glad you're asking, all you have to do is " 'ai tahaono 'i ho'o 'ulu" {put the 16 in your head} put your 16 in your head and count on "lau ki he uanoa pea ke tu'u" [when you get to 20 you stop].((acknowledging Dan's utterance in turn 29))
32. T: DAN I'll explain in Tongan to you "keke mahino'i" {so you can really understand} "valu moe fiha 'o ma'u ai ae tahataha" {8 and what makes 11?} 8 and what [makes 11]
 AM: [Mele, you need two more] ((DR interrupting when teacher talking to Dan)) PA
 T: No no no no, you need to sh - Joseph I asked you to show, use the counters. So "koe valu 'e Dan" {here's 8} "kamata hiva" {start from 9} "koe fo'i me'a 'e fiha" {how many after he gets to 11} Dan? ((acknowledging))
33. AM: ((showed teacher his small whiteboard with the answer on)) PA
 T: Is that right? Check it.
 (5.0)
 AM: You need three more
 T: No no listen, counters. I asked you to use the counters
34. D: "Teu tu'u 'i he fiha?" {where do I stop?} Miss B? AGC
 T: Stop "Tu'u 'I he tahataha" {stop at 11} I'm glad you're asking me when you don't know how to do it "fiha?" {how many}
35. AL: five? RC
 T: Write it down. You have to show me, hang on. You have to have the counters. Dan you did the right thing "valu" {8}=
36. AL: Finished Miss B AGP
 T: Yeah
37. R: Miss B I don't have a pen AGP
 T: You have to use =
38. D: Miss B I did it AGP
 T: "Ko e fo'i fiha?" {how many?} ((acknowledging utterance))
39. T: 14 you have to count on, show me ((to someone else))
 AM: Mele I'm going "poako" {homework centre} where you do different things Tongan. EXPE

T: No wonder he goes to homework. That one is very good ((to researcher)). Well done Joseph.

40. AL: Miss B

GA

T: You have to show me count 14 and what makes 19? 14 count on. (3.0)
I can't hear you Maxwell, big voice.

AL: 14,15,16,17,18?

T: 18. Now where's your one. Where's your counters. 12 and what makes 16. ((to another child in group)).

41. T: So how many have you got there ((to another child in group)) "fiha e?"
{how many?}

AM: Four

PA

T: "fiha e?" {how many?} (not acknowledging Joseph))

42. AM: Four

PA

T: I didn't ask you dear.

43. T: Now if I have (2.0) [6 and]

AM: [Mele]

GA

T: Joseph I know you know these, some of these. If I have 8 and 6 what am I going to put in my head? ((second sentence to the rest of the group))

NB At this point the teacher sent 3 of the 5 students away and the remaining two stayed on the mat for extra work. This was recorded but not transcribed as this situation was different to any of the others recorded and introduced another variable into the study, which could skew the results.

AM 19/24 utterances acknowledged

AL 5/9 utterances acknowledged

R 2/5 utterances acknowledged

D 3/5 utterances acknowledged

S 0/0 utterances acknowledged

Anecdotal observations of follow up work

Joseph had completed only 4 out of 20 on his worksheet. Despite seeming confident and clearly knowing what to do during the small group session he was unable to complete the worksheet – had spent most of his time colouring in the small pictures. Sammuel worked very well independently and had completed all of his worksheet correctly. Maxwell was working well, but got about ½ correct. Dan was busy finding a pencil and did not have time to begin the worksheet before the bell rang. Rita just began the worksheet.

It was noticeable during the whole lesson that children frequently interrupted and asked the teacher for help and further instructions. These were given for the most part quickly and simply, and did not interfere too much with the small group lesson. Children appeared comfortable with coming to the teacher for help.

Appendix J: Example of Teacher Interview Summary

Interview with Jose 8 September 2004

As you know, one of the aims of this research has been to find out what students do, when they don't know what to do in maths lessons. Ideally, what would you like to see happening when this occurs?

When working on follow up independent activities, ask another person in their group, or a person in another group.

When working in the small focus group, some kids will ask but a lot won't. Can tell who doesn't know by body language so then she asks THEM.

She would like the children to ask when they don't know what to do, but feels they are too scared: *Ideally I'd like them to ask me but I know a lot of them, I just think a lot of them think, I think a lot of them feel scared to ask...*

They don't come and ask when the teacher is working with another group as this is not allowed.

What guidelines / rules / procedures (if any) do you have surrounding talk and discussion during maths lessons. How do you make sure that the children know about these?

Put your hand up (very definite about this and quick to answer). Children who are quick to answer have to put their finger on their nose as this gives slower children a chance to answer. The rules were made explicit at the start of the year.

Talked about 'think, pair, share' strategy learned in the literacy contract, and explained that she also used this when working with a small maths group ie children tell a buddy how they got an answer, then told the teacher.

In general, how often do you think students initiate interaction with you during maths(e.g. ask you a question, give you an instruction, tell you about something unprompted)?

Some groups don't do much talking because they are not working at exactly the right year level, so those children who find the maths difficult don't say much because they don't know the answer.

The confident children who know the answers dominate the talk.

No there is probably not much initiation by children in maths groups, because the teacher is dominant, asking the questions to elicit the thinking she wants to see happening.

Maybe 'cos I'm just so chatty – vocal I don't give them a chance. I don't know like, 'cos I'm wanting them to think all the time, like I'm asking them all the questions...and I'd love it to be more them and take a step back so they can start questioning, but I think I just take over...

Also talked about children being scared of asking questions, for fear of being told off for not listening.

Do you find some students talk with you more often than others? Why might this be? Can you think of an example?

Yes definitely. More confident students who are willing to take risks talk more often with the teacher. Some children don't ask because they don't want to be wrong and are afraid of being moved down to a lower group (referred to Indian children).

Daniel enjoys maths even though he's not particularly good at it. Evan is shy and unsure, so doesn't ask many questions. *At home he's (Evan) not really taught to um... speak out of place, you know?... I mean I know a lot of the Pacific, they're told a lot and they don't talk back kind of thing...*

Talked a lot about the home backgrounds of students and how this had an effect on children's confidence and willingness to initiate interaction in the classroom. Children who had parents who talked with them were more likely to initiate than children who had parents who were more authoritarian and talked TO them. Compared Daniel and Evan. Evan's parents put pressure on him and wanted to know what he wasn't good at, but Daniel's parents were more positive and talked about how well he was doing and the progress he had made (during parent interviews).

Gina talks a lot and so does her mother – she's a very confident child.

Why do you think students might initiate interaction with you in a maths lesson?

When they don't understand – but they don't do it much.

Probably when they don't understand, I guess... but they don't really do that much.

Talked about how one child won't ask in front of the group but comes and asks when the group has gone off.

Talked about children not wanting to show they understand in front of peers, to with 'status.'

Some children won't ask questions (when they don't know what to do) because they're scared of letting the teacher down.

Very reflective – said that the questions (for the interviews) made her think that she didn't enable students to ask questions often enough.

Do you think children would be more comfortable initiating interaction with a teacher, if the teacher was from the same culture as him/her? Why, why not?

No. There are other factors, as discussed. Boys would rather ask their peers than the teachers.

Do you think any of your own cultural practices and beliefs impact on the way you teach and interact with students in your classroom? Explain.

Definitely – you can't help but bring in your own beliefs. Cultural things don't impact as much as beliefs and experiences – especially her own when she was at school.

Found it difficult to distinguish between teaching style, beliefs, and cultural practices. Teachers have completely different ways of doing things and it's difficult to say whether or not this is because of their culture, or their teaching style.

After further thought talked about having white teachers at school, white lecturers at teachers college and then began talking about 'Western European' influences on her. She was aware of her own culture – then talked about not sitting on tables and not patting children on the head.

I'm aware of my culture like I wouldn't sit on a table in front of them and I wouldn't pat some of them on the head, although I don't do that anyway...

Thought that 'White Western Culture' was quite authoritarian – although this was tentative.

Tell me what you understand about cultural values and practices of people from the Pacific Islands such as Tonga, Niue, Samoa, and the Cook Islands that might have an impact on how these students behave and learn in the classroom.

Talked about the high expectations of parents. Talked about parents teaching their children that the teacher was the boss and so the children were too scared to ask questions or take risks.

When asked how she could address this problem said that she asked children who didn't volunteer to 'get them talking' but realized that this was also threatening.

Said that children like Daniel and Evan were well behaved in front of the teacher, but naughty behind her back.

Pacific Island children are more likely to get into trouble at home than NZ European children. NZ European parents had different attitudes towards discipline than PI parents.

NZ European children more likely to answer back and be openly naughty because they are less likely to get into trouble at home. Gave the example of a NZ European boy who had to write a letter home when caught swearing and kicking on the playground. When asked how his parents reacted, he replied that his mother said he was not in trouble because he was honest and he should try not to do it again.

Tell me what you know about cultural practices of NZ European people that might have an impact on how these students behave and learn in the classroom.

Stressed that she was making broad generalizations, but felt that NZ European children generally came from smaller families so parents had more time to spend with doing things like reading and cooking (in comparison to PI children). They are more integrated into their parents' lives. PI children probably interact more with brothers and sisters than parents. NZ European children have useful prior knowledge which helps them when they come into the classroom, because of the nature of their pre-school experiences.

Do you think students who come from minority cultures have the same opportunities to interact in New Zealand mainstream classrooms, as NZ European students? Why or why not?

If I was the teacher I'd hope to say yeah!

But maybe not because if they're not confident to ask questions and take risks, they don't have the same opportunities.

Depends on the teacher and the school. If the school has a philosophy of including other cultures then that helps.

*** Showed some of the results then asked these questions more specifically related to the data.**

Why do you think Gina and Daniel had considerably more initiations than Evan?

Gina is so persistent.

Gina and Daniel don't mind getting the wrong answer.

Why do you think Evan had so few initiations?

Evan's not confident.

Not confident to take risks. Personality: happy to sit back and watch everyone else.

Why do you think you acknowledged Gina's initiations more often than Daniel and Evan's?

Surprised and concerned that she acknowledged Gina more than Daniel. Said that is was possibly because she wanted to 'shut her up' ie if she didn't acknowledge her, she would just keep interrupting.

It's nothing to do with liking one child more than another. Daniel is not as demanding as Gina.

Are you concerned about the progress of any of these students in terms of maths?

Evan maybe, only because he lacks confidence, although his maths ability is ok.

When you leave here today, is there anything you will continue to reflect on as a result of what we have talked about?

Will regroup children for maths, taking into consideration personality. Will put quiet, less confident children together to see if this will encourage them to talk and question more, without the more dominant confident children in their group.

I would love Evan to say to me "Hey I don't really get that, could you slow down a bit, cos I'm not really...."

Acknowledged that she may have discouraged their initiating because she doesn't like 'calling out'.

Acknowledged that her and Bill were similar in that they didn't like calling out.

Last year I struggled with the whole classroom management thing, so I think this year I've been a bit of a dragon, really put my thumb on people calling out. I don't respond to the ones that call out.

Other points of interest

- Talked about assuming a second language learner should be in the low ability group for maths (because he didn't speak much English and didn't say much) and then when tested, realized he should have been in the highest group.
I've had Kevin in the triangles because he doesn't speak much English, in the lower group, and he's like, he's probably the top of the class... and he wasn't saying anything.

Appendix K: Example of student interview summary

Interview with Maxwell 15 November 2004

Tell me about where you and your family comes from.

Tonga – no hesitation. Both parents come from Tonga, and Maxwell speaks Tongan sometimes.

When someone asks you what country you come from, what do you say? Why?

M: “The island I come from is Naumoka and my country is Tonga.”

Do you know what country Miss B (teacher) comes from?

Na! Then when asked if she comes from the same country as him, straight away replied Tonga.

Would you (do you) like having a teacher from the same country as you?

M: “I like um, I like my teacher when she comes from my country because she, we can, she can tell us more about Tonga and we can learn how to say more words in Tongan, and that she, she, she helps us on everything and helps us when we’re stuck on Tongan words and stuff that we don’t know.

Definitely wanted a teacher from the same country when given the options of same country, different country, or didn’t matter.

R: “Why’s that?”

M: “Cos I wanna learn more Tongan and that I love, I love this culture because you, cos I can speak two languages, and that um, that Tongan people they like they they make the best tapas out of all the islands.”

Why or why not?

Who looks after you at home?

Sister, cousins, or mum or dad.

Does _____ (mum, dad, aunty, grandpa etc) tell you how to behave at school?

Yes, immediate answer.

(If yes) What do they say?

Respect the reliever as much as you respect the teacher.

R: “What else do they tell you?”

M: “And that, to follow the teacher’s rules, that she says, and make her job easy, everyday and that to don’t muck around in the classroom. When she’s in a hurry somewhere to go, like if we’re in a hurry get all your stuff that you need to pack and then leave with her.”

Does _____ (mum,dad, aunty, grandpa etc) tell you about talking and asking questions in the classroom?

Yes.

(If yes) What do they say?

Misunderstood the question – talked about how they asked him about his day etc.
When the question rephrased more specifically about HIM talking at school, he said they don't tell him anything about this.

Now I want you to think about when you are doing maths in your group, and you are sitting on the mat and _____ (teacher) is doing some work with you.

Are there any rules that you have to remember when you are in this group?

Yes

(If yes) What are they?

M: "To don't look at other people's work. To don't cheat, and that, to concentrate on your own work, and that try your best and um that, um... that um, cover your work from other people with books, and if and if other people are looking at you say 'stop it I don't like it'."

If you know an answer, or you *can* do something, what do you normally do?

M: " You put your hand up. Wait for your turn. Um, if Miss B picks another person and she says to put your hand don't be angry, and don't be nervous to um to tell your answer and if you get it wrong, don't be ashamed to yourself because um you can have another turn and you might get it right. And that if you're new and you're trying in um your maths group and people laugh at you with your maths and you get it all right or all wrong, um just ignore them, cos one day they might fail, their maths, their maths."

If you don't know how to do something, what do you normally do?

Try to figure it out, try to remember what's been taught before, try your best.

Is maths easy or hard for you?

Easy

Why?

Helps you to learn to count – Jesus helps us.

Now I want you to think about when you are doing a maths activity on your own (like a worksheet), and the teacher is not working with your group.

Are there any rules that you have to remember when you are doing this work?

Yes

(If yes) What are they?

If playing a game, take turns, don't cheat, share.

If you can't do the activity, or some of it is a bit hard, what do you normally do?

Figure it out, try to remember, don't look at stuff around the class – that's cheating.
Ask the teacher if you don't understand, try your best.

What do you think the teacher wants you to do, when you find the work a bit hard?

Ask the older children, try your best – it doesn't matter if you get some wrong.

Do you ask many questions at maths time?

Yes.

Why/ why not?

M: "Because I wanna learn how to count and that and I want to learn how to do timetables and to get used to maths and that um, when I grow up, when I'm in college when I have my maths exam, then I'll pass."

Summary

Maxwell was very confident and was able to answer all questions easily. He is very aware of his own culture and his teacher's. He thinks it's important to have a teacher from the same culture, because it helps you learn the language. He is very aware of rules and procedures in the classroom. Has a number of strategies to use when he finds things difficult and knows to ask the teacher. As well as being aware of rules and procedures he understands the importance of learning the content of maths.

Appendix L: Strategies students reported using during maths lessons

Name of student	Learning strategies	Non specific general strategies	Procedural strategies
Kim	<p>Specific strategies for adding and subtracting.</p> <p>Ask the teacher for help.</p> <p>Work with a buddy but don't copy.</p> <p>Ask someone in your group for help.</p> <p>Use the strategies the teacher has taught.</p>		<p>Put your hand up or put your hand on your nose or ears and don't call out.</p> <p>Sit up, don't lie down.</p> <p>Be quiet so you don't disturb the teacher.</p> <p>Play fair</p> <p>Include everyone.</p>
Essie	<p>Ask teacher for help.</p> <p>Ask someone near you for help if the teacher is busy.</p> <p>Stay on the mat for extra help.</p> <p>Refer to instructions on the worksheet.</p> <p>Refer to the examples on the worksheet.</p> <p>Think in your head how to do it.</p> <p>Show your working out.</p> <p>Ask questions when it's hard.</p>	<p>Try hard.</p> <p>Concentrate.</p>	<p>Skip it if it's too hard.</p>
Gina	<p>Use equipment (e.g. cubes) to help you.</p> <p>Try to ask the teacher for help.</p>	<p>Try to figure it out.</p>	<p>Try to get everything finished on time.</p> <p>Put your finger on your nose when you have the answer</p>
Evan	<p>Work with your fingers.</p> <p>Ask another person for</p>	<p>Try your best.</p> <p>Just work it out.</p>	<p>Look at the teacher when she's teaching you something.</p>

	<p>help.</p> <p>Ask the teacher for help.</p>		<p>Don't tell tales when the teacher is with another group.</p> <p>Don't disturb the teacher.</p> <p>Don't shout out.</p> <p>Don't hide the mobilo.</p> <p>Go to the maths corner if the work is too hard.</p>
Andy	Ask somebody to help you.	Try to think about it.	<p>Sit up.</p> <p>Cross your legs.</p>
Luke	<p>Ask someone to help you.</p> <p>Ask Karen to help you.</p> <p>Ask questions at maths time, to get the answers.</p>	<p>Listen to the teacher when she's talking.</p> <p>Concentrate.</p>	<p>Don't get up and talk to other people.</p> <p>Don't flick the pencils around.</p>
Rita	Ask the teacher for help.	Listen to the teacher.	<p>Get your books and pencils and write what the teacher tells you.</p> <p>Colour in and underline things.</p>
Maxwell	<p>Remember what's been taught before.</p> <p>Ask the teacher if you don't understand.</p>	<p>Concentrate.</p> <p>Try your best.</p> <p>Don't be nervous to tell your answer.</p> <p>Try to figure it out.</p> <p>Jesus helps us.</p>	<p>Don't look at other people's work.</p> <p>Don't cheat.</p> <p>If people are looking at your work say "Stop it I don't like it."</p> <p>Put your hand up and wait for your turn.</p> <p>Share.</p>