Discourse Contexts for Second Language Development in the Mainstream Classroom

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A thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy

VOLUME 1

Chapters 1-5

Faculty of Education University of Technology, Sydney

June 1999

Certificate

I certify that this thesis has not already been submitted for any degree and is not being submitted as part of candidature for any other degree.

I also certify that the thesis has been written by me, and that any help that I have received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

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Acknowledgements

First, I would like to thank Penny and Kath, the two teachers who so graciously allowed me to scrutinise their classrooms, who willingly gave up their time to talk with me about the work, and whose teaching provided the basis for this thesis. Their teaching and commitment to their students was truly inspirational.

Many thanks are due to the children themselves. Their participation, involvement and enjoyment of learning made data collection a delight. Their words are a source of fascination to those interested in how children learn about the world and develop language.

I am also very grateful to Renata Atkin, for her help and patience in assisting with the final production of this thesis.

Finally, very special thanks are due to my supervisor and colleague, Mike Baynham, whose insightful and patient feedback has constantly challenged and extended my thinking during the writing of this thesis.

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Abstract

In Australian schools in the late nineties approximately one quarter of all students are from a language background other than English. Although many of these students are fluent in English in informal conversational contexts, there is evidence that such students are not always able to control the more academic registers of English associated with school learning and literacy. A major challenge for teachers is therefore to integrate subject learning with English language learning, and to find ways to support the language development of students concurrent with the construction of curriculum knowledge.

This study addresses that challenge. Drawing on data from two classrooms of nine and ten year olds in the curriculum area of science, the study explores how the discourse of the classroom can be enabling of language development. It does not attempt to make claims about what might be common to all classrooms, but rather points to those practices which are shown to be supportive of second language learning. The aim therefore is not to suggest what is common to all classroom discourse but what its potential can be for second language development. The study takes as a basic principle the notion that language development interacts dynamically with the socio-cultural context in which it occurs, and cannot be fully understood without taking account of this context.

Although the analysis draws on systemic functional linguistics it does not purport to be a study 'in' linguistics, but rather, through a theorisation of practice, seeks to contribute to a theorisation of second language pedagogy in the mainstream classroom. To this end, the analysis is also informed by a neo-Vygotskian approach to learning and teaching, by second language acquisition (SLA) research, and by critically conceived notions of minority education.

A number of conclusions are drawn from the study. First, it shows how, through a process of recontextualisation of student talk, the teachers jointly construct with the students aspects of the science register. It concludes that when teachers encourage the dialogic function of discourse to develop, (that is, when knowledge is seen as co-constructed between teacher and learners, rather than transmitted from teacher to learners), this *also* leads to the kind of teacher-student talk which is most enabling of second language development. The study demonstrates that even apparently minor changes in interactional patterns can have quite major effects on the progress of the discourse as a whole, and can make the difference between

discourse which is likely to constrain or facilitate language development and learning.

The thesis also shows how the discourse incorporates a range of interactional patterns, each of which tend to be used for distinct pedagogical purposes, and thus how the role of the teachers correspondingly changes at different phases of the teaching and learning cycle. The study concludes that a reconceptualisation of pedagogy is required which foregrounds the *relationship* between teaching and learning and the nature of teacher mediation in the teaching and learning process.

The study identifies other significant factors for language development in the classrooms examined: the language knowledge of the teachers, the explicitness of the discourse, (including explicitness about language and about the social aspects of participating in the class), the sequence of teaching and learning activities, and the importance of the intertextual links, the 'dynamic' context, which were the result of this sequence.

Finally, the study points to the value of approaching SLA research and pedagogy with a model of language which goes beyond a description of its phonology, morphology and syntax, one which allows for the study of discourse and for the study of language development in terms of socio-linguistic competence, and for the value of a socio-cultural and classroom-based approach to research into second language learning and pedagogy.

Some notes on style and terminology

The use of pronouns

In writing this thesis I have chosen to use 'I' when expressing a personal viewpoint, rather than using a term such as 'the researcher', which I believe creates an unnecessary distance between reader and writer. Where 'we' is used, its use is intended to indicate reader inclusivity.

Gender inclusive language has been particularly problematic, since, for example, I have frequently needed to refer in a generic sense to 'a child' but have not wanted to use 'he' or 'she' as a generic category, nor the rather clumsy convention 'she/he'. While the use of 'children' would have avoided this problem, this does not always capture the appropriate meaning. I have chosen therefore to use the third person gender neutral terms 'they', 'their', and 'them', as is common in spoken English. My reference in adopting this style is the third edition of the *Macquarie Dictionary* and *The Cambridge Australian English Style Guide* (Peters 1995). Where this usage might be confusing for the reader, (for example if there is another referent to which 'they' could also refer), I have used the more conventional 'she/he', abbreviated to 's/he'. To avoid the same problem, I have referred to teachers as female throughout the thesis, recognising that this is an imperfect solution.

Where 'he' is used within quotations to refer generically to both sexes, I have left the text in its original form, recognising that such usage needs to be interpreted within the conventions of an earlier period. I have chosen not to include the addition of *sic*, since this may risk becoming repetitive for the reader.

Inverted commas

Full quotations are enclosed by double inverted commas, as in the quotation from Edwards and Westgate in the discussion of the notion of discourse below. Single inverted commas are used to signify a particular construct or notion, (as in the example: *the teacher's role is seen as a 'facilitator'*). Where it is a notion associated with a particular writer, for example, Vygotsky's notion of 'inner speech', it is ascribed to them in the first instance and is usually first introduced in the context of a longer quotation.

Notes on Terminology

text

Some linguists (for example, Stubbs 1986) make no theoretical distinction between the terms 'text' and 'discourse'. In Hallidayan grammar (1985) and systemic linguistics generally, a text is defined as a complete semantic unit, whether written or spoken. In this thesis the term 'text' is used rather differently, to refer more specifically to sections of discourse which have been chosen for analysis. It thus refers here to that part of the product or record of the discourse considered relevant to the analysis, and is therefore an artefact of the data presentation itself, rather than a reference to the actual discursive process by means of which that product was generated. A text therefore encapsulates a particular part of the ongoing discourse which has been selected for scrutiny. As such, it should always be read and interpreted as an excerpt from the ongoing discourse, a "significant fragment of the evidence on which the account is based" (Edwards and Westgate 1994, p. 107).

discourse

In this study 'discourse' refers to naturally occurring spoken text. Following Stubbs (1986), the term 'discourse analysis' is preferred over 'text analysis' because of my usage of text as defined above, and because the latter may imply a particular European tradition of text linguistics.

ESL and *minority learners*

There is a tension in a thesis such as this, and in the educational community more broadly, between wishing to avoid the naming of students in simplistic and potentially negative ways, (particularly where the term might suggest notions of deficit[1]), and the need to identify the common characteristic of the kinds of students who are the subject of the study. The term *ESL*, (English as a second language), is commonly used to describe both the field of learning, and the students themselves. I have tried to avoid wherever possible this latter use as a generic label for learners, to avoid the suggestion that 'ESL

[1] The term NESB (non-English speaking background) has for example been widely criticised for apparently naming students only in terms of what they are *not* able to do. More recently in Australia, second language learners have been referred to as LBOTE (language background other than English) students and also as bilingual students. My personal preference is for the use of the latter term, since it foregrounds the fact that students are operating in two language domains, home and school, and thus their linguistic achievements. Since the focus of this study is however specifically the learning of English as a second language, I have chosen not to use this term in the study.

learners' can be viewed as a single group who share personal characteristics, histories, family backgrounds and cultures in common. However, given the topic of the thesis, it is at times necessary within the text to refer to that group of students who share this aspect of school learning. I have preferred, in other instances, to refer to *minority learners*, or *minority language learners*, referring to the fact that these learners speak a first language which is not the dominant language of the school.

outcomes

The term 'outcomes' is increasingly used in Australia and other countries to refer to the means whereby the individual achievements of students are measured and evaluated. Except where indicated, this is not the sense in which it is used in the study, where it refers in its broader sense to the total process of formal education, in terms of the life choices these experiences make possible for students. While there can never be the same, or 'equal', outcomes for all students in any simplistic sense, I make the assumption that education must be concerned with 'equality' of outcomes. That is, there are some things that education should be expected to provide for all students: the means to fully realise individual potential, and the means to participate in society and make informed life choices.

A glossary of linguistic terms used in the thesis can be found at the end of Chapter 3, following the discussion of systemic functional linguistics.

CHAPTER 1

Introduction

"I can say what I want but not for school work or strangers."
(Year 6 ESL student, responding to the question "*How good is your English?*"
McKay 1997, p. 247)

Background to the Research

The quotation with which this introductory chapter begins is from a student in her final year of primary school. English is her second language and has been the medium of instruction for her years of primary schooling. Her response to the question *How good is your English?* encapsulates the issue with which this research is concerned: while she is fluent in most everyday contexts, she does not yet control the more academic and less contextualised language associated with classroom learning. This study examines the way in which the discourse of the classroom can support second language learners in their development of these more academic registers. The data come from two mainstream primary classrooms where almost all the students were from language backgrounds other than English. The primary data are transcripts of discourse, supported by field notes, interviews with students and information on teachers' planning programs.

In countries such as Australia, Canada, UK and US, where there has been large scale immigration, it is no longer unusual to find in many classrooms large numbers of students who are learning English as a second language. In Australia approximately one quarter of all school-aged students come from a language background other than English, and in many schools in the larger cities, the percentage is very much higher, with up to 95% of children from a non-English speaking background and with often more than twenty different languages spoken within the school. These children come from a variety of linguistic, cultural, socio-economic and educational backgrounds. Some children are highly literate in their first language, some are literate only in English, others are literate in both, some in neither. They may have arrived in Australia as refugees, having experienced personal trauma and interrupted periods of schooling. They may have arrived as first generation migrants already literate in their first language and with cognitive and conceptual development appropriate to their grade level. Or, currently probably the largest group, they may have been born in Australia, and entered the first year of school speaking their mother tongue but little or no English, and having had all their conceptual development in their first language up to that point.

This latter group is typical of many second language learners in schools in Australia in the late 1990's. Normally these children rapidly become fluent in the day-to-day, face-to-face contexts of interpersonal communication, such as the playground. Such contexts tend to be less cognitively demanding, and language is usually contextualised in the immediate situation. Evidence suggests however that while many students may be competent in these contexts, they are not necessarily able to

control the more academic language associated with the classroom, even after five or six years in mainstream classes (Cummins 1981, 1994, 1996; Collier 1987, 1989). Second language proficiency of school-aged students is related to the control of sociolinguistically appropriate registers, often characterised by less context-embedded language and occurring in more cognitively demanding contexts. These registers play a primary role in the development of literacy skills, especially vocabulary knowledge, metalinguistic awareness and the processing of written language. Studies have shown that a period of around five to seven years of school may be needed for second language students to achieve at the levels of their native English-speaking peers in academic English (Cummins 1981, 1994, 1996; Collier 1987, 1989). Without specifically targeted support, therefore, minority language children are less likely to acquire academically related language than their dominant-language peers, although ironically, the fluency that many of them have in day-to-day contexts may mask their real learning needs in more academic registers. In Australia, the findings of these studies have been replicated (McKay, Davis, Devlin, Clayton, Oliver, and Zammit 1997): namely that five year olds entering school with no English are likely to be still insecure in the use of academic language after five or six years of study.

English language support is therefore needed far beyond the early period of arrival or the first years of schooling. Yet in Australia, although specialist English as a Second Language (henceforth ESL) classes exist in some schools, they cater largely for newly arrived children, or for children with obvious communication difficulties in English. A formal program of bilingual or ESL support for other second language learners is not a usual part of a school program unless instigated (and funded) by the school itself. In addition, funding for ESL teaching has gradually reduced, while at the same time there has been a philosophical choice away from the notion of 'withdrawal' classes. Thus most ESL learners in the late nineteen nineties now spend all their school day in a mainstream classroom (that is, a regular classroom which has not been constituted for the purposes of ESL teaching). Since in almost all schools in Australia the language of instruction is English, these students must learn not only a second language, but must learn *in* it and *through* it at the same time. For these students the second language is thus both a target and medium of education, an end in itself and the means whereby curriculum knowledge is constructed. Thus teaching programs in all curriculum areas must integrate language and 'content', while mainstream teachers carry the dual responsibility for the development of ESL students' subject learning, and for their English language and literacy development.

While teachers are in general willing to take on this responsibility, many have had no specialist training in ESL teaching, and minority children are regularly taught in mainstream classrooms by teachers inexperienced and untrained in the area. It is clearly essential for teachers of second language learners to understand how language works to create meaning, and to be able to use this knowledge to inform their planning across all areas of the curriculum. Yet recent studies of Australian classrooms (Cairney, Lowe and Sproats1994; Breen, Barratt-Pugh, Rivalland, Rohl, Rhydren, Lloyd and Carr 1994; Freebody, Ludwig and Gunn 1995) have found little evidence of schools reflecting the special needs of students learning school subjects through the medium of their second language. As later discussion will show, much research has acknowledged the potential of the content classroom for second language learning. However while researchers have argued at a theoretical level for the value of content-based language learning, complex questions remain about how such programs should be conceptualised, and how they can be operationalised. This thesis is an attempt to respond to these questions.

Specific Aims of the Research

The overall aim of the study is to identify patterns of discourse in classroom interaction which are enabling of second language development, but which at the same time support the learning of curriculum knowledge. Specifically, it focuses on the learning of an academic register of school by students who are already familiar with the English of day-to-day, face-to-face contextualised situations. It seeks to address the question of how these more academic registers can be taught, and what contexts for second language development can be constructed through classroom interactions in the course of regular curriculum subjects (in this case, the curriculum area of science).

The three part triadic structure of traditional classroom talk, or IRF, (discussed in subsequent chapters) suggests a view of knowledge which sees it as a 'body' of information to be transmitted to learners. While such discourse is not necessarily ineffective in all learning contexts, it tends to restrict second language learning opportunities because it reduces opportunities for language use. In addition, when it is the dominant mode of discourse in the classroom, it positions students as passive learners because it restricts opportunities for questioning, discussing and critiquing ideas. It has been suggested (Cummins 1988, 1996) that minority students in particular may be further disadvantaged because such patterns of discourse, albeit unintentionally, have tended to position them as subordinate or less than capable. This study therefore seeks to address what options there are for other

discourse patterns in the classroom which may be more facilitative of language learning, and to explore how classroom discourse can be more democratic.

The way these issues are played out in the classroom cannot be examined without also taking into account the part played by the teacher. Questions arise as to what this role might be in a language-based content classroom and how it might be played out when the teaching agenda encapsulates both subject teaching and language development. Thus the study also explores the role of the teacher in the learning process. This is relevant not only to this research area, but also as a contribution to the broader debates, ongoing in educational forums over the past twenty years, centring on how teachers should teach. These debates have often centred around a number of binaries: process versus product; teacher-centred versus student-centred; traditional versus progressive; and (in Australia in particular, in relation to literacy teaching), progressive versus genre approaches. There has also been debate around teaching methodology, and around learning theory, yet these two domains of education have rarely informed each other nor been brought together within a unified theory. In its examination of the role of the teacher in second language learning, the study aims to theorise the role of the teacher within a more unified theory of teaching-and-learning.

The study is therefore not simply a linguistic description of a second language pedagogy: it does not claim to be a study 'in' linguistics. Rather it aims to contribute more broadly to a theorisation of pedagogy itself, viewing teaching as a domain of theory and research in its own right. This broader pedagogical aim requires going beyond the traditional fields of second language acquisition or of linguistics. I see this as an opportunity to integrate methods and domains of knowledge that have been sometimes artificially separated by disciplinary boundaries, and to bring together bodies of research which can yield complementary insights into the discourse of second language classrooms. Thus the account of classroom practices throughout the thesis combines a recognition of the psycholinguistic processes of second language learning with a theory of language which is sufficiently complex and specific to detail the interactive processes by which classroom discourse itself can function as a mediating tool for second language learning. At the same time the account is informed by a view of learning which draws from socio-cultural theory and by critically conceived theories of pedagogy. Given the complexities of teaching and learning, this multi-disciplinary perspective is, I suggest, especially relevant to any study which attempts to demonstrate how theory and practice in second language education can inform one another.

What is required for the purpose of such an investigation is the development of a way of analysing the data which is sufficiently precise to ground them within their immediate situational context but broad enough to locate them within the wider curriculum content and ongoing classroom processes in which they occurred, while at the same time considering their significance for second language development. To this end I draw on insights from systemic functional linguistics, neo-Vygotskian approaches to learning and teaching, critically conceived pedagogical approaches to multicultural education, and second language acquisition studies. Chapter 2 reviews the relevant literature in these domains, drawing them together towards a principled theorisation of a pedagogy inclusive of minority learners. This multidisciplinary approach is an attempt to take account of the highly complex and multi-faceted phenomenon that constitutes pedagogy. Chapter 3 discusses key methodological issues for such research. Drawing on the whole corpus, Chapter 4 defines the major themes that emerge from the data as a whole.

In the later chapters the approach enables three perspectives to be taken on the discourse of the classrooms: the classroom is viewed from more than one angle. The first of these perspectives focuses on how teacher and students jointly construct meanings through their discourse, and how the teacher talk gradually recontextualises students 'every day' language in the process of the development of the more formal registers of school. This perspective on the discourse uses systemic functional linguistics as the tool for analysis and is developed in Chapter 5. The second perspective on the discourse draws on neo-Vygotskian theory to examine the role of the teacher in students' second language and curriculum learning, and is developed in Chapter 6. The third perspective draws on SLA research to examine the data from the standpoint of the learner, and to identify the kinds of discourse contexts, and the pedagogical activities by which they were realised, which are enabling of second language development. This is developed in Chapter 7.

Relevance of the Research: its contribution to second language pedagogy

There are a number of reasons why this study is relevant within the broader social and educational context, and a number of ways in which it seeks to address some relatively under-researched areas.

First it is clearly important for reasons of social and educational equity that educators develop the knowledge and skills to respond to linguistic and cultural diversity, and to consider how the language of the classroom can serve as a resource

for language development. From the beginning of their formal schooling ESL students are potentially disadvantaged in relation to their English speaking peers: English speaking students are educated through the medium of their first language whereas ESL students are expected, in most schools, to learn through the medium of their second. One response to a situation where large groups of learners are learning in what is often their less well developed language is for a teacher to consciously simplify or modify the language of the classroom, by, for example, attempting to avoid all lexical or grammatical complexity which is beyond what she believes to be her learners' current understanding, a kind of 'simplified reader' approach to her own language use. While this strategy may help to make language comprehensible to learners in the short term, it does not take into account how the learner is to obtain new linguistic data, and can lead ultimately to a simplified, reductionist or 'alternative' curriculum. In turn this creates lower academic expectations which, as many studies have shown, impact negatively on students' educational outcomes. In addition, a response to linguistic diversity which is based on linguistic simplification reduces what is often the main source of English language data for young ESL children, and is likely to provide an insufficient basis for the ongoing development of a language-for-learning. It remains therefore the task of educators to find ways of responding to the challenges of linguistic diversity which do not rest on the creation of a reductionist curriculum. This thesis contributes to that response.

Second, the thesis aims to broaden the focus of SLA research. As will be argued in the discussion of methodology in Chapter 3, most SLA researchers over the last two decades have tended to view SLA as a mental process, and have generally adopted research approaches which are dominant in psychology, and characterised by the perspectives of mentalism and individualism. These studies are based on positivist approaches which seek 'objective', or 'hard' data; they aim to produce replicable findings, and commonly utilise experimental research designs and paradigms. While I do not suggest that a focus on cognitive factors is irrelevant, nor that the approaches that characterise this focus are always inappropriate, I believe that if this remains the dominant line of enquiry for the entire field, it may lead to an increasingly narrow view of what is a complex phenomenon. It is the assumption of this thesis that language development is not simply a mental process but is embedded in the sociocultural contexts in which it occurs, and that it cannot be analysed or fully understood apart from its situational and cultural contexts. Although a concern with the social and situational context is increasingly evident in more recent studies of minority groups and of second language development, there is still in general a dearth of socially situated SLA studies. The thesis represents a

further contribution to this group of studies. In order to consider language in its situational and cultural context, it takes a qualitative interpretative approach, thus utilising an alternative research approach to the positivism that has dominated much SLA research. Hence, both in the nature of its concerns and in its methodological approach, the thesis offers an alternate perspective to mainstream SLA research.

There is also comparatively little research which has focused on the development of register in a second language. To date, much work in SLA has focused on language form and the learning of grammatical sub-systems. This has led, for example, to insights into learners' acquisition of morphology and syntax, and the orders in which these are acquired. Studies which are based on the sentence or clause as a unit of analysis, however, can say little about the acquisition of discourse, and so do not provide the linguistic insights necessary for the design of curriculum and pedagogical models for the development of subject registers. Yet, as suggested earlier, it is these academic registers which school-aged ESL learners must learn to control.

The third area to which this research seeks to contribute is that of second language pedagogy itself. As Chapter 3 suggests, the dominant approaches in second language acquisition research have tended to exclude the classroom as research site; only a relatively small number of second language studies are located in authentic classrooms and many theories make no specific comments about classroom learning, either as relevant data or as relevant application. There are also relatively few studies addressing the pedagogical implications of linguistic diversity, or studies of how the integration of second language and content learning can be operationalised in the mainstream classroom. Research which deals with the nature of second language teaching in its broader social context is therefore rare; many questions remain about how teachers can best support learners' language development, and what kinds of discourse contexts are enabling of second language development. In particular, given increased numbers of second language learners in schools, research sites need to include not only specialist ESL classrooms but mainstream classrooms too, so that second language researchers can collaborate with mainstream educators in finding the imaginative and equitable solutions required to respond to the needs of minority learners in mainstream classrooms.

In addition, as Chapter 3 points out, the lack of classroom-based (as opposed to classroom-oriented) second language research which specifically addresses teaching and learning may serve to widen the already present gap between researchers and

practitioners. This study aims both to respond to the need for more classroom-based research and to reduce the gap between research and practice. It takes the classroom as research site, and aims to theorise practice itself, thus viewing 'theory' as a reflexive dimension of 'practice'. It is based on the assumption that many teachers have considerable skills in interacting and responding to their ESL students which they have developed through their day-to-day practical experience, and that this experience should be seen as essential for the development of pedagogical theory. Yet many theories come from those who are disconnected from daily contact with schools, while teachers' own knowledge and understandings remain untapped, remaining in the form of intuitive understandings rather than explicit knowledge. As argued in Chapter 3, the methodological approach taken in this thesis offers the possibility of making teachers' intuitive understandings explicit. It is only when this knowledge is articulated, or 'propositionalised' that it becomes usable for teacher training or professional development. From the perspective of educational research, then, one of the most important contributions of a qualitative approach to classroom research, such as that taken in this study, is that it can recast teachers' innate understandings as educationally 'useable' propositions.

Beyond the study: towards educational change

Activity theory, discussed further in Chapter 3, suggests that the means, or 'operation', by which things get done, are often routinised and below the level of participants' conscious attention. Classroom talk, for example, which realises the overall goal of education, may be largely routinised much of the time, such as when IRF interactions predominate and are normalised as the unquestioned interactional structure. At times, however, operations cease to remain at an unconscious level, because participants' attention is directed towards *how* they are carrying out an activity, perhaps because the activity itself is interrupted or problematised. Then participants may have to attend more to the means whereby the activity is being carried out, so that what has been previously automatised temporarily receives conscious attention, and perhaps changes as a result. As a result of the change of operation, the activity itself becomes changed, possibly in quite profound ways. As suggested earlier, qualitative research is able to articulate or propositionalise the intuitive behaviour of teachers. Thus it provides one of the means whereby educators are able to reflect on routinised behaviours and unquestioned operations. In this way, such classroom-based research has the potential to act as a catalyst for educational change.

Activity theory makes it possible to theorise how the power to change education may ultimately rest with teachers themselves. Small changes in how teachers interact with their students might be expected to have possibly profound effects on how the discourse as a whole proceeds, and ultimately on the whole process of education. Like a stone thrown into a pond, these ripples have the potential ultimately to change what Engerstrom (1991) refers to as the encapsulated nature of schooling, so that interactional change may become one of the avenues to educational change (van Lier 1996). One of the questions this notion raises, and which the outcomes of a study on classroom interactions can begin to address, is what these 'points of leverage' might be and what other pedagogical options for classroom interaction are possible.

Much classroom research attempts to describe, within the researcher's framework, what *is*. As this discussion suggests, my aim in this study is also to point to what *can be*: a pedagogy of possibility. By identifying those classroom practices and discourse patterns which can be shown to be supportive of second language development, it is hoped that this study will also show what is possible, and will contribute to the development of more theoretically informed and equitable curricula, and more effective classroom practices, for minority second language learners.

While the study focuses on second language learners, its findings relate also to other students. The presence of minority language students in a school, while posing a challenge for mainstream teachers, can also be at the same time a catalyst for pedagogical development. Many native speakers of English are also marginalised in some way within the dominant discourse of a middle-class, Anglo-Saxon education system. As a result of poverty or social background or non-standard dialect, these students may also have difficulty with the specialised language registers of school curriculum subjects. A recognition that the language of school subjects cannot be taken for granted but has to be taught, finding stimulating and effective ways to do so, and critically examining ways to increase students' participation in classroom discourse, will assist not only second language students but also many of their English-monolingual peers.

Van Lier (1988) has pointed out that while studies of first language classrooms have provided much needed insights into the classroom life of learners and their teachers, there are relatively few descriptions of this kind for second language classrooms. To date this remains largely true. This study aims to make a contribution to the further development of such insights.

CHAPTER 2

Connections Across Discourses: Towards a Theory of Practice

Teachers have developed the conviction that no single perspective on language, no single explanation for learning, and no unitary view of the contributions of language learners will account for what they have to grapple with on a daily basis.
(Larsen-Freeman 1990, p. 269)

INTRODUCTION

This research is a study of pedagogy, which aims to explore how classroom discourse can contribute to the learning and educational outcomes of minority learners. The study is not simply a linguistic description of practice, but rather seeks to theorise a pedagogy for minority learners from the practices observed. Implicitly or explicitly, such a theorisation makes assumptions about what constitutes 'good' or 'effective' practice, yet such terms are clearly meaningless unless they are first unpacked in terms of the world view within which they have been constructed. It is necessary, then, to make explicit on what basis it will later be argued that certain moments in the classroom or particular aspects of practice are to be viewed as significant. When texts are selected for analysis they are chosen because they represent something which the researcher sees as significant, and what the researcher 'sees' is coloured by certain assumptions and belief systems.

This chapter seeks to uncover and make explicit the theoretical principles, assumptions and beliefs which have informed the study. They relate to particular views of language, of learning, of second language learning and of the position of minority learners in a mainstream educational institution. Thus although the study is concerned specifically with the English language development of children who speak it as a second language, the task requires going beyond the traditional field of second language acquisition (SLA). The study draws on systemic linguistics, neo-Vygotskian approaches to teaching and learning, theories of minority education and second language acquisition research. This chapter reviews the literature in these fields in order to address educational issues around the education of second language speakers in the mainstream classroom, issues which are broader than, although inclusive of, second language learning per se. The chapter considers what sort of educational program and educational practices might be expected to support both language and curriculum learning, and concludes with some implications about what such a classroom might be like.

Each section of the chapter deals with a particular body of research. Part 1 discusses models of learning, focusing in particular on the insights from Vygotskian and neo-Vygotskian thought. Part 2 explores those aspects of SLA research which will later be drawn on in exploring the potential of classroom discourse to provide contexts for second language learning. Part 3 examines research which focuses on minority education, in order to theorise the relationship between teachers and minority learners. The systemic model of language itself is discussed in Chapter 3,

since it is of particular relevance to the methodological approach taken. Such an interdisciplinary approach has the disadvantage of not allowing space for an in depth examination of each single perspective. However what this approach does offer is a means of theoretical triangulation, the possibility of taking several perspectives on the same data set, and examining pedagogy with a multi-faceted view. This multidisciplinary approach appears to offer greater potential for understanding the complexity of the day to day life of the classroom.

Throughout this chapter, I have related the key issues raised in the literature to the concerns of this study. Thus this review of literature aims not only to provide a theoretical background to the thesis, but also to introduce the issues which are taken up in its subsequent chapters.

PART 1: THEORIES OF LEARNING

Introduction

Part 1 discusses some of the major pedagogical approaches which have influenced primary education in Australia, the UK and Canada during the twentieth century. There is always a risk when carrying out such a review, that, to use MacLure's term (1994), we 'tidy up history', oversimplifying the diverse influences which have impacted on pedagogy, and the extent to which they have impacted on each other. Philosophical approaches are not discrete; they do not simply begin and end, but continue to leave traces beyond the epoch in which they influenced initial changes. As MacLure expresses it: "there is a pervasive tendency for one rationale to shade off into another and even borrow the coloration and rhetoric of its opposite" (MacLure 1994, p. 140). However, with this in mind, it is possible to define two major orientations which have dominated educational thinking this century, and a third which more recently has developed from one of them. The first is a view of teaching and learning which has been variously referred to as traditional, transmission-based, or teacher-centred. The second is frequently referred to as progressive or child-centred. These are discussed below. The third approach which is discussed shares much in common with progressive pedagogy but is underpinned by a theoretically different framework: this is the approach which is variously described as, 'socio-cognitive', 'neo-Vygotskian' (Mercer 1994), or 'social constructivism' (Edwards and Mercer 1987; Barnes 1992; and Wells 1992)[1]. Since

[1] Following Mercer (1994), the term neo-Vygotskian is used in this thesis.

this last approach underpins much of the analysis of the thesis, it is preceded by a discussion of its theoretical framework which draws from the work of Vygotsky.

Traditional and progressive approaches

Paulo Freire has provided the metaphor of 'banking education' for the transmission-oriented instructional model that has dominated Western pedagogy (Freire 1983). The teacher's role in this model of pedagogy is seen as a purveyor of knowledge who deposits information and skills into the empty memory banks of students, assigned the role of passive recipients. Such teaching is generally characterised by high teacher management. Learning, viewed as a matter of building up skills from simple to complex, progresses through a sequence of teacher-controlled steps. The pedagogy typically relies largely on memorisation and repetition and is in part influenced by behaviourist notions of learning, involving minimal negotiation between teacher and student (Webster, Beveridge and Reed 1996, p. 39). There is little explicit theoretical underpinning for this view of teaching, perhaps because it has been 'normalised' for so long. There is however an implicit view of knowledge which this view espouses, the assumption that it is a fixed and immutable body of authoritatively-given explanation and practice, where the teacher is expert. In Piaget's view " the students' intellectual and moral activity remains heteronomous (subject to external law) because it is inseparable from a continual restraint exercised by the teacher" (Piaget 1971, p. 151).

An explanation for the dominance of the transmission model during the twentieth century is to be found largely in the model of communication which has been unquestioned since the rise of empiricist philosophy, and which sees communication as a matter of information transfer. Language is seen as the vehicle for transferring thoughts and ideas from one person to another; in listening or reading people extract these thoughts and ideas once again from the words. Language in this model therefore functions like a conduit, by means of which 'content' or 'information' is conveyed (Christie 1990; Reddy 1970; Wells 1992). Since it implies a separation of language and content, it results in artificial distinctions being made between form and content, or product and process (Christie 1990). The conduit metaphor, because of its model of communication, also underlies several key educational constructs which have influenced thinking in this pedagogy. Notions of 'decoding', 'encoding' and 'transmission' for example are primarily concerned with how far the linguistic codes and intended meanings of speaker and listener coincide. Where different or divergent meanings are reconstructed by the listener or reader, this is seen as a 'break-down' of communication.

Methodologies for teaching language within a transmission model operate within the limitations of this communication framework. Concerns with the importance of decoding and encoding in the communication process have tended to lead to teaching the component parts of language separately, beginning with elements seen as 'simple', and progressing to more complex forms. Thus phonics instruction is seen as a prerequisite for reading, and spelling and grammar as a prerequisite for writing. In the second language classroom, this approach is paralleled by teaching sequences where a focus on specific grammar and vocabulary precedes language use, and more tightly controlled language exercises precede language tasks which allow broader choices of language on the part of the students (see for example, Ur 1989, and for a critique of this approach, Willis 1990). Inherent in this view of language teaching is the assumption that language must first be 'learned' before it can be 'used'. This study challenges such a view, and will show how language can be learned in the process of being used to construct new curriculum knowledge.

In heavily teacher-centred classrooms, a dominant interactional pattern in classroom discourse has been identified, variously described as Initiation, Response, Feedback (Sinclair and Coulthard, 1975); Initiation, Response, Evaluation (Mehan 1979); triadic dialogue (Lemke 1990a); and the 'two-thirds rule' Edwards and Mercer (1987). This interactional pattern is discussed in more depth in Chapter 4, but is described here briefly. It typically consists of three moves. The teacher first produces an initiating move, often a question to which she knows the answer, and which is designed to elicit a particular response. The student then responds by answering the question, after which the teacher offers feedback or evaluation on what the student has said. Mehan (1979) calculates that over half the total interactions in the nine lessons he analysed were of this type. Edwards' and Mercer's reference to the two-thirds rule refers to the fact that, when this interactional pattern dominates the classroom talk, someone is talking about two thirds of the time, about two thirds of that talk is the teacher's, and about two thirds of the teacher talk is spent in lecturing or asking questions (Edward and Mercer 1987).

Transmission teaching has been criticised on a number of grounds. The conduit model of language on which it is based, for example, is challenged by social constructivist and socio-linguistic models of communication which are discussed later in this chapter. There are also particular implications for minority and second language learners within a transmission-based classroom. From the perspective of language learning, the dominant discourse patterns that occur, typically of the IRF

type, are not congruent with the central principles of second language learning discussed in the next section of this chapter; in particular, they restrict learners' opportunities for extended language use in communicative interaction. Within the restricted form of dialogue that the IRF pattern produces, there is what Barnes (1976) refers to as a 'yawning gap' between the language and conceptual frame of the teachers, a gap, it could be argued, that is widened for students learning in their second language. In addition, such approaches are criticised as presenting a curriculum sited solely within the dominant culture, and providing little or no opportunity for minority students to express their particular experiences and non-mainstream views of the world to peers and teachers (Walsh 1991; Cummins and Sayers 1995; Cummins 1996). An instructional pattern that involves a lot of talk by the teacher and listening by the students suggests, in addition, an "(implicit) teaching dependence upon authority, linear thinking, social apathy, passive involvement, and hands-off learning" (Sirotnik 1983, p. 29). Yet transmission-based assumptions about teaching and learning have dominated the education of so-called disadvantaged students. Since such children have been seen by some as culturally deprived, educators have attempted to eradicate what they viewed as deficient prior learning, and replace it with more appropriate language and cognitive skills. Because such children were thought incapable of benefiting from a more challenging curriculum, and believed to require more control and structure from the teacher, compensatory programs have tended to focus on drilling children in low level language and numeracy skills (Cummins, 1996). Although few educationists, linguists, or cognitive psychologists would now endorse the assumptions of a transmission approach to pedagogy, calls for 'back-to-basics' instruction regularly occur at times of public dissatisfaction with education, (usually as a result of broader social and economic anxieties such as a lack of employment opportunities and fear of economic hardship, and often fanned into existence by political motivations).

Since the 1970's, major changes in educational practice and challenges to heavily teacher dominant approaches have occurred. Partly this has been the result of the influence of the much earlier work of John Dewey (see for example, Dewey 1902, 1916), the significance of which lay in his assertion that the life of the mind is a dynamic reality, and learning is a constructive activity. Thinking takes place when, faced with a new challenge or problem, old habits or old learning fail to work. Education is therefore seen not as a matter of habit formation or conditioning or the receiving of information, but of intelligent enquiry and thought.

The other major influence in the move away from traditional 'chalk and talk' approaches was the work of Piaget, which, though it was not primarily focused on education, produced educational studies of the development of children's thinking which have been and still remain extremely influential in early childhood and primary education. New learning "depends crucially on what the learner already knows" (Barnes 1992, p. 124), and occurs when they make changes to their existing understandings or model of the world, reshaping old knowledge in the light of new ways of seeing things. In contrast to the transmission view of learning, progressive pedagogy emphasises active student enquiry in the learning process. Cognitive and academic development are seen as dependent on students integrating new information with their prior experiences and actively constructing knowledge. Unlike transmission views of learning which are concerned largely with the acquisition of information, child-centred pedagogies emphasise an 'interpretation' view, and are concerned with the learner's struggle to understand, and thus with individual cognitive and personal development (Barnes, Britton and Torbe 1986).

In general, Piaget does not attribute a great deal of importance to language in the early stages of development, and as later discussion will show, this is one area in which he differs fundamentally from Vygotsky. Piaget argues that intellectual development proceeds along a defined set of biologically determined stages (although not at the same rate for all children), of which language is an outcome. He argues that it is not until what he terms "the formal operational stage", that language is closely related to and contributes to the development of thought. Piaget suggests that this stage occurs when the child is around fourteen, and becomes able to systematically explore abstract relations, independent of content and concrete materials. Piaget argues that intelligence develops naturally and spontaneously, and that the processes of development "may be utilised and accelerated by education at home or in the school, but that they are not derived from that education and, on the contrary, constitute the preliminary and necessary condition of efficacity in any form of instruction" (Piaget 1971, p. 36). Since it is the child's own developmental processes in interaction with their environment which provides the timing and motivation for change, then an implication of Piaget's thinking for pedagogical practice is that social facilitation (that is, intervention by the teacher) is only effective when the child is 'ready' to move forward.

Since Piaget argues that each stage of development is characterised not by a particular "thought content" but a certain power and ability in thinking, then another important pedagogical factor from a Piagetian perspective lies in the way learning experiences are presented to children, so that each child can develop optimally

according to the development of their own intellectual structure. It is a small step from this to the belief that many educationists following Piaget hold, that what is taught is of less importance than how it is taught, and that curriculum, or content, is important only insofar as it allows children's intellectual structures to develop (see, for example, McNally 1973). From Piaget's thinking comes the notion of 'readiness', which, in the school context, has led to the belief that the learning content of the curriculum needs to be matched to the developmental level of the child if learning is to occur:

> The construction of an appropriate curriculum ... clearly implies an attempt to match material and experiences to various developmental levels which is what curriculum committees in fact do.
> (McNally 1973, p. 93)

In reality this appears to be a distortion of what Piaget actually suggested, since he insisted that learning experiences should *challenge* the learner, in order to provide some conflict so that cognitive restructuring may take place. McNally, writing at the time when progressive education was beginning to influence primary education in Australia, continues: "the most fundamental of Piaget's insights for education is that the child literally builds his own intelligence, that he is in fact the architect of his own growth". This view of the individual nature of learning differs significantly from that of Vygotsky, although, as later discussion will show, perhaps in more subtle ways than is often recognised.

At this point it should be pointed out that there are a wide range of approaches which have come to be called 'progressive', ranging from more extreme forms of deliberate non-interventionist teaching styles to approaches which are underpinned by neo-Vygotskian principles and which argue for an explicit role for the teacher as guide and mediator. Some extreme forms of progressive pedagogy have taken Piaget's work to suggest deliberate non-intervention on the part of the teacher. This is an approach which, if one returns to the work of the original theorists, does not coincide with their views: in fact there is nothing in Piaget or in much of the work of educationists who were influenced by his views which suggests that a teacher should not intervene in student learning. Cambourne for example explicitly argues that giving children responsibility for their learning does not mean teachers abdicate all responsibility for the learning of their students (Cambourne 1988). It is important to stress, therefore, that many of the strongest criticisms of progressive pedagogy, which are discussed later, have been based on its more extreme realisations. It is also useful to make a distinction between so-called progressive approaches, and

what has become known more generally as neo-Vygotskian or constructivist approaches, which are discussed in the next section of this chapter. While it is important to recognise that the latter build on the early work in progressive education, in particular in the importance they place on children's active engagement with their learning, they are also informed by additional and more recently accepted theoretical perspectives drawing from socio-cultural theory and the work of Vygotsky. Thus while it is a misrepresentation to suggest a clear distinction between these two approaches (see for example recent work by Barnes, 1992 which clearly encapsulates both a Piagetian and Vygotskian perspective), there are some significant differences in the way that these two notions of child-centred learning have been interpreted in pedagogical terms.

I use the term 'progressive' here to refer to the approach to teaching which was characteristic of the early work carried out in the late sixties and seventies, largely at that time in the UK, by researchers and educationists such as Barnes, Britton and Rosen (1969); Martin, Williams, Hemmings and Medway (1976) and Moffett (1968), all of whom were influenced by the developmental theories of Piaget. Progressive approaches have also been associated with, among others, Graves in Canada (Graves, 1983) and Cambourne, Walshe, Sawyer and Watson in Australia (Cambourne 1988, Walshe 1981; Sawyers and Watson 1987). The ideas of these educationists have helped to shape major changes in pedagogy: 'chalk and talk' has largely given way (at least in most primary classrooms) to many more child-centred practices.

The progressive ideology was spelled out most clearly in Britain in 1967 in the Plowden Report, *Children and their Primary Schools*, a government supported policy statement based on Piagetian principles. Discovery, play and first hand experiences are emphasised, and it reinforced in particular the Piagetian belief in children's 'readiness' to learn. Teachers were advised to move children forward only "once they are standing firmly on one step of the Piagetian staircase of cognitive development, with their resources gathered to make the next step upwards" (Edwards and Mercer 1987, p. 38).

Also central to progressive theory is a belief in the critical importance of language in the process of understanding. In the 1960's the work of Wilkinson (1965) who coined the term 'oracy', and later Britton (1970), Barnes (1976), and Tough (1977), and others brought to attention the role and importance of spoken language in the school curriculum, which until that time had given prestige almost exclusively to the written form. The role of talk in learning, in the shaping of thinking and

understanding, and its relationship with reading and writing were issues that had previously received little or no attention in nineteenth and twentieth century education. The recognition today of the importance of spoken language in the school curriculum, and thus many of the assumptions made in this thesis, has its origins in this work.

Since that time, and particularly since the 1970's, the importance of language in education has also been seen as relevant not only to language as 'object' but to language as 'medium', that is, not only to language as a subject but to its role in all areas of the curriculum. This recognition of the role of language in learning resulted in the doctrine of 'language across the curriculum', which was highlighted in the UK in *A Language for Life* (the Bullock Report 1975), a report which was extremely influential and is still referred to. Among the basic tenets of this report are the belief that language develops through purposeful use, that it occurs through talk and writing, and that it contributes to cognitive growth. In relation to oral language, the authors write that "we cannot emphasise too strongly our conviction of its importance in the education of the child".

Attitudes to student talk in the classroom thus changed significantly during the seventies, "a change which moved talk from something to be forbidden to something to be encouraged at all costs" (Phillips 1985, p. 59). In this belief educationists were supported by socio-linguists such as Halliday (1975) and Stubbs (1976) who argued for the value of children's own language as a starting point for learning in school. Since research has demonstrated that teacher-fronted classrooms tend to constrain children's talk (Barnes 1976), progressive approaches make extensive use of small group cooperative learning (for example, see Britton 1970; Barnes 1976; Barnes and Todd 1976; Martin et al 1976; Reid, Forrestal and Cook 1989).

A number of rationales for oracy have been suggested since the early 1960's, including oracy for personal growth, oracy for learning, oracy for functional competence and oracy for cultural transformation (MacLure, 1994). The 'personal growth model' argued for diversity and difference, and celebrated the languages and dialects that children bring to school. The inclusion within the classroom of informal demotic spoken genres of everyday communication represented a fundamental change in thinking; spoken language had previously only been allowed into the classroom "in its best clothes" (MacLure 1994). The model of 'oracy for learning' sees talk as central to the learning process and has been far reaching in its effects. While it was part of the ideology of early progressive education, it has remained equally central since that time (see for example Phillips 1985; Booth and Thornley-Hall

1991; Norman 1992; Bruner 1994; Wells 1992, 1994a; and Mercer 1994, 1995). Most recently, there has been a move towards 'oracy for functional competence' which is concerned with what students should be able to do in terms of communicative purposes or functions. The rationale for functional oracy comes largely from the demands of the workplace, and is exemplified in the statements of the National Curriculum in the U.K. and, to a lesser extent, in the National Statements and Profiles (1994) in Australia. 'Oracy for cultural transformation' addresses issues of power, gender, race and class and has been influential in the development of critical approaches to minority education.

One of the educational implications of this diversity of rationales and objectives for oracy is that educators should "rethink the boundaries which have been erected around 'educationally relevant' talk" (MacLure 1988, p. 4). A broader conception is needed of what learning through language looks like. The data in this study suggest the significance of this broader conception for learning through language.

Along with an increased focus on spoken language in the classroom, progressive approaches to teaching language and literacy argue that language can only be learned when it is kept whole and used for meaningful and purposeful communication. The notion of 'whole language' has been influential in the development of literacy inservice (for example, 'ELIC', the Early Literacy Inservice Course used extensively in Australia in the mid 1980's) and in a large number of professional books for teachers (see for example Walshe 1981; Turbill 1982; Parry and Hornsby 1985; Hornsby, Sukarna and Parry 1986; Cambourne 1988; Brown and Mathie 1990).

As a reading of these writers suggests, progressive approaches in Australia have been particularly associated with the teaching of writing. The major themes within this approach are that children learn most effectively when they are encouraged to start with their own expressive language, that 'meaning' is more important than 'form', and that writing should take place frequently and within a context which provides 'real' audiences for writing. A particular feature of this approach, often termed the 'process approach', is the importance placed on the processes of learning. Proponents of the importance of process in the teaching of writing have argued that if teachers study the process by which writers produce real writing, they will discover how to teach writing better (Walshe 1981). Where the classroom climate expects a quantity of writing across a range of purposes and forms, the child will write on a variety of subjects and in many forms. Key factors in students developing literacy are the degree to which they are 'immersed' in books, and the

opportunities they have for self-motivated writing (see for example Hornsby, Sukarna and Parry 1986; Cambourne 1988).

This view of teaching and learning is consistent with many interpretations of Piaget's work where the student is seen as a self-motivated individual who behaves as a mini-scientist, mini-historian, mini-writer and so on. As discussed earlier, Piagetian theory sees a child's current stage of development as the determinant of what they will learn, which cannot be changed by the teaching itself. Thus the teacher's role has frequently been interpreted as a 'facilitator', whose job is to provide a wealth of materials to create the kind of stimulating environment in which the student's own curiosity and interest will pace the learning that occurs. The teacher is viewed as a coordinator and a resource person, whose chief role is to foster a spirit of enquiry.

Following these principles, the Plowden Report offered this advice on the teaching of science:

> The treatment of the subject matter may be summarised in the phrase 'learning by discovery' ... Initial curiosity, often stimulated by the environment the teacher provides, leads to questions and to a consideration of what questions it is sensible to ask and how to find the answers ... [The teacher] will miss the whole point if he tells children the answers or indicates too readily and completely how the answers may be found, but he must not let them flounder too long or helplessly ... Essential elements are enquiry, exploration and first hand experience.
> (Plowden Report, para. 669, cited in Edwards and Mercer 1987, p. 37)

The student is therefore seen as taking much of the initiative in determining their own learning pathway, with little explicit guidance or management on the part of the teacher. Although the Plowden Report had warned against the misapplication and overuse of discovery learning, the ideology that children can only learn by direct, hands-on experience, is implied by Piaget himself when he states that "each time one prematurely teaches a child something he could have discovered for himself, the child is kept from inventing it and consequently from understanding it completely" (Piaget in Mussen 1970, p. 715). Progressive approaches influenced by such thinking have been characterised as student-driven and as exhibiting low teacher management (Webster, Beveridge and Reed1996).

Against the backdrop of such thinking, many teachers in Australia felt uneasy about any kind of intervention in student learning, feeling that they must let children find their own way. Christie reports "more than one teacher I have encountered has spoken shamefacedly of intervening in their children's learning, particularly in the writing program, reluctant to acknowledge what they have seen as a betrayal of their responsibilities as teachers" (Christie 1990, p. 18). One of the unfortunate effects of progressive thinking in Australia was the development of extreme forms of non-interventionist teaching, which were vehemently attacked by proponents of the genre movement (see, for example, the debates between Martin, Christie and Rothery, and Sawyer and Watson, in Reid 1987). This debate is now briefly reviewed.

The so-called 'genre movement' was underpinned by a very different view of language development from the more 'biological' notion of development suggested by Piaget. Although it is recognised within the genre approach that children are programmed to learn language, whether they do learn it, and for what purposes, is seen as dependent on the sociocultural contexts in which they have participated.

The theory of genre underlying the movement was developed by Hasan (1978), Kress (1982), Martin (1984a) and others. Within this theory genre is most commonly defined as a staged, goal-oriented social process (Martin, Christie and Rothery 1987). A written genre has a social purpose which is reflected in the way it is staged and in its specific linguistic features. Because it pertains to a particular culture, then for language teaching purposes "a useful way of viewing a culture is in terms ... of its purposeful activities" (Painter 1988). Learning a second language thus means learning the language to participate in the second language culture.

In the early 1980's, Martin and Rothery carried out a large-scale investigation of children's writing in the primary school. Contrary to the beliefs of many proponents of more progressive ideologies, the expected range of writing forms or genres were not evident. Rather it was found that many children regularly wrote variations of the personal recount genre and showed little understanding of the linguistic structure and features of other genres such as expositions, explanations, procedures and information reports, genres which in school traditionally represent the 'prestige' and more highly evaluated genres (Martin 1984a). Christie argues:

> In all but a very limited sense, it is meaningless to draw a distinction between 'process' and 'product', either in general curriculum and learning theory, or in language curriculum theory. That is because in the act of

> using language, either spoken or written, one necessarily engages both in process and in product building: but, and this is the important point here, unless one's attention is properly directed towards the 'product' — upon the kind of text type or genre which the occasion requires — then the activity of using language is merely unfocused in a very unhelpful way.
> (Christie 1990, p. 17)

While acknowledging the strengths of the progressive movement in developing approaches which recognise the importance of interesting and interactive educational settings, it has been argued, in relation to minority learners, that such approaches also tend to reinforce existing social inequities, since what is expected of learners is often not made explicit (Martin 1986, 1989; Martin, Christie and Rothery 1987; Delpit 1988; Boomer 1989). Feez (1995) argues:

> in many respects ... progressive approaches have reinforced the inequalities of access which are characteristic of older, traditional pedagogies. It is simply that in progressive pedagogies, the way these inequalities are perpetuated becomes invisible. Learners' individuality and freedom may be more highly valued in progressive classrooms, but during and at the end of their courses of study learners are still assessed against the standards of the dominant culture ... although classrooms are more pleasant, what is actually expected of learners in order for them to be successful is not made explicit ... progressive classrooms tend to reinforce existing social inequalities of opportunity because it seems that it is the learner rather than the educational institution, who is to be blamed for failure in such benevolent and rich learning environments.
> (Feez 1995, p. 9)

Genre theorists have also argued that proponents of progressive approaches have quite rightly rejected the narrow view of grammar and the model of language and literacy that it presented, which had been so influential in schools, yet they point out that progressivists propose no coherent model of language to replace it. They argue that what is missing from the progressive model is a way for teachers and students to reflect on language itself, so that teachers are guided in language planning and student assessment by an explicit model of language and can make explicit to students who are unfamiliar with the language of school how to use the registers associated with power and educational success. Thus whereas progressive theorists have argued for an understanding of writing by focusing on personal growth and process, genre theorists have argued for an understanding of the

linguistic nature of texts as they are produced within social contexts and for various purposes. Those working within the genre movement also argue strongly that educators have a responsibility to intervene in the learning process (Martin, Christie, Rothery1987; Kalantzis, Cope, Noble and Poynting 1991).

Part of this debate can be seen as a debate about the model learner. Progressive theory implies a 'psychological individual', the learner as a 'lone organism' (Edwards and Mercer 1987). One of the results of such a view, as Feez (above) points out, is that educational failure is also then individualised, and seen as a feature of the learner. While progressive educators do not explicitly espouse this view, it is a real and possible consequence of a view of learning which minimises the active role played by educators in the teaching and learning process. As the next section will suggest, there is an alternative view of the learner: the learner as social participant, whose learning occurs primarily as a result of the socio-cultural situations in which they participate. This view of the learner, and the consequently more active and guiding role for the teacher, is consistent with the theories of those working within the genre movement and with the principles of Hallidayan linguistics. It draws for its theoretical framework from the work of the Soviet psychologist, semiotician and pedagogue, Lev Vygotsky. The next section discusses this work.

The Contribution of Vygotsky

Vygotsky's writings encapsulate three overall themes (Wertsch 1985; Wertsch and Toma 1991), each of which is relevant to this study. First, there is the notion of genetic or developmental method, which asserts that it is only possible to understand mental functioning if its origin and developments are understood. Second, and related to this, there is the claim that an individual's higher mental functioning has a social origin. Third, there is the claim that human activities are mediated by material or symbolic tools or signs; one such tool, and the most extensive, is language. Each of these themes is now examined.

Vygotsky's theory of genetic orientation asserts that it is only possible to understand aspects of mental functioning if one first understands their origin and the transitions that they have undergone: attempting to understand mental processes simply by analysing only the products of development may be misleading. Perhaps because of his commitment to practical concerns of education, Vygotsky's genetic orientation focuses primarily on one domain, ontogenesis or development over the life span. He argues that an understanding of this development is crucial to understanding both the individual, and the cultural and

social activities in which the individual is involved. However in order to provide an account of human mental processes, he also applies this approach to three other domains: phylogenesis, development in the evolution of the human species; sociocultural history, development over time in a particular culture; and microgenesis, development over the course of, and resulting from, specific interactions within a particular sociocultural setting (Wells 1994b). It is this last aspect of genetic orientation, the microgenetic, that is the closest to the concerns of this study: in Chapters 5 and 6 the microgenetic significance of teacher-student interactions is examined.

Related to the notion of genetic orientation is Vygotsky's assertion that mental functioning has its origins in social processes and remains 'quasi-social' in nature. In their own private sphere, human beings retain the functions of social interaction: "the individual dimension of consciousness is derivative and secondary". (Vygotsky 1979, p. 30). This idea is formalised in Vygotsky's genetic law of cultural development:

> Any function in the child's cultural development appears twice, on two planes. First it appears on the social plane, and then on the psychological plane. First it appears between people as an interpsychological category, and then within the child as an intrapsychological category. This is equally true with regard to voluntary attention, logical memory, the formation of concepts, and the development of volition ... internalisation transforms the process itself and changes its structure and functions. Social relations or relations among people genetically underlie all higher relations and their relationships.
> (Vygotsky 1981, p. 163)

The social origins of psychological phenomena are thus foregrounded. Wertsch and Toma (1991) argue that the clear cut boundaries between individual and social that characterise much western thought are not part of Vygotsky's approach. Rather, the processes and structures of the two planes of functioning are inherently linked. Likewise, Wells argues that the connection "is found in the mediating function of signs and, in particular, of speech" (Wells 1994b, p. 60).

Vygotsky's formulation of the notion of 'inner speech' suggests how the intermental and intramental perspectives are related and how the psychological perspectives on learning which focus solely on the individual, and which have played such a

significant role in western education, (for example as in the progressive approaches discussed in the previous section), can be addressed from a socio-cultural perspective. Both Piaget and Vygotsky noted the phenomenon of young children engaging in private speech, sometimes in interaction with an adult but often alone, about what they were doing or the course of action they were taking in solving a problem. Whereas Piaget argues that this private speech 'withers away' as the child matures and as they develop 'social' speech, Vygotsky (1978) argues that the social speech between a child and an interlocutor is at a later point internalised to become inner thought. The child internalises the mental processes made evident in social activities, and moves from the social to the mental plane, so that the individual's mental processes mirror the social environment from which they are derived. What is experienced at first in interaction with others, is gradually internalised and becomes a resource for self-directed mental activity such as problem solving and reflection. For Vygotsky, talk is therefore not simply a mirror on a child's inner thought processes, as Piagetian theory would suggest, but constructs and shapes thinking. Vygotsky's empirical experiments with pre-school children showed that egocentric speech almost doubled as a task was made more difficult, whereas school-aged children carrying out the same task thought in silence. When these students were asked what they had been thinking about, their responses indicated similarities between their covert behaviour and the overt verbal thinking of the preschooler. Vygotsky concluded that the operations which the preschooler carried out in overt speech were carried out by older children in inner, soundless speech (Vygotsky 1981). In the process of developing conceptual thinking, then, children move from a dependence on the linguistic context to a focus on the sign-sign relation of the adult. (For a complementary account of the process of development from a linguistic perspective, which focuses on language as social behaviour and the realisations of development in external speech, see Halliday 1975; Painter 1984, 1985; Hasan 1986; Cloran 1989).

Vygotsky's view of language as the root of learning is therefore markedly different from Piaget's notion which sees language largely as a by-product of intellectual development. For Piaget, intellectual development is universal and independent of cultural context. As discussed earlier, while acknowledging that educative and social transmission play a role in cognitive development, he asserts that this is formed through structures preliminary to the social transmission itself. For Vygotsky, by contrast, the cultural context *determines* the type of cognitive processes that emerge, a notion that is further supported by empirical evidence in cross-cultural settings (see for example Scribner and Cole 1974; Luria 1976), and by work

which shows how reasoning is closely related to the social transaction in which it occurs (Donaldson 1978).

The notion of inner speech suggests that any examination of teaching and learning in the classroom will treat interactions between teacher and learner as crucial, since these same interactions will shape young children's talk, and ultimately construct their processes of cognition. In relation to this study, the theory offers a strong theoretical justification for the investigation of teacher-student talk. If, as Vygotsky argues, social relations between individuals underlie higher cognitive thinking, then talk between teacher and students is of major significance in determining the nature and shaping of what will later become students' inner thinking. Thus we would expect that differences in teachers' interactional styles with students and the patterns of classroom talk they set up, might influence students' later intramental functioning differentially. If this is the case, educators need to consider how far the interactions in which students are involved are likely to constrain or extend their intellectual potential. Young argues that where classrooms are not characterised by the kinds of interactions which encourage enquiry, students are likely to acquire only a highly context-specific knowledge (Young 1992), and that when teachers are concerned solely with the transmission of items of knowledge to students, they deprive the learner of the opportunity of posing their own validity questions, constraining the learner instead to responding within the teacher's epistemological frame of reference, and on the basis of the teacher's authority, "sowing the seeds of perhaps lifelong habits of aquiescence to authority" (Young, 1992, p. 48). The forms of thinking and literacy that are encouraged in school anticipate the forms of civic participation that students will eventually undertake (Cummins 1996). In a more constraining type of teaching context, students also get no sense of the dialogue between the members of the specialist community through which the discipline has grown, been revised and developed (Rosen 1986). As Edwards and Mercer assert, "it is essentially in the discourse between teacher and pupils that education is done, or fails to be done" (Edwards and Mercer 1987, p. 101).

If educators wish for different sorts of educational outcomes from those which Young, Cummins, Edwards and Mercer are critiquing, that is, if students are to learn to analyse and explain experience, solve problems and develop and challenge ideas, then Vygotskian theory would suggest that what is needed is a critical examination of how far the discourse of the classroom, and in particular the interactions between teacher and students, is likely to develop these modes of thinking. We need to discover in what ways a teacher's regulation of a classroom can be more than "a means of control" to become "a building block for the child" (Foley 1991, p.19).

Some of the ways in which the teachers in this study provided such 'building blocks', referred to later as 'scaffolding', is explored in Chapter 6.

The third theme from Vygotsky's work is the notion of mediation, his assertion that human activities and human mental functioning are mediated and facilitated by 'tools', that is, cultural practices and artefacts. Artefacts include tools such as writing instruments, clocks, wheels and levers, and symbolic signs or modes of representation such as mathematical systems, diagrams, musical notation or writing systems. He argues that the cultural legacy of a society is expressed through the tools that have been developed to aid in the social activities in which people take part. Individuals learn to think by using these mediating tools, the most significant and extensive of which is natural language, (of which the language of the school is a unique and institutional example). Thus language functions not only as a mediator of social activity by enabling participants to plan, coordinate and review their actions, but is also the tool that mediates the related mental activities in the internal discourse of inner speech (Vygotsky 1978).

Mercer interprets the role of language within a Vygotskian perspective thus:

> Language is ... our essential cultural tool — we use it to share experience and so to collectively, jointly, make sense of it ... Language is therefore not just a means by which individuals can formulate ideas and communicate them, it is also a means for people to think and learn together ... Although it is useful to describe language as having these two functions, its cultural function (communicating) and its psychological one (thinking) are not really separate.
> (Mercer 1995, p. 4)

It is this aspect of Vygotsky's work, the notion of cultural mediation, that Cole and Wertsch (1996) argue constitutes the greatest distinction between Vygotsky and Piaget (virtual seminar), and thus, by extension, between the two related educational approaches. The most often presented distinction between the two theories is the individual/social distinction, yet, as Cole and Wertsch point out, Piaget did not deny the role of the social world in the development of the individual intellect, and nor did Vygotsky ignore the centrality of the active construction of knowledge.

The major difference between the two theorists lies in the fact that for Vygotsky the social world has *primacy* over the individual, since society is the bearer of the

cultural heritage without which mind cannot develop. Cole and Wertsch suggest that there is no counterpart in Piaget to this focus on the importance of cultural artefacts in human mental processes. Related to this is the role of social transmission in development within the two accounts. For Piaget, social transmission influences primarily the 'content' of knowledge, for Vygotsky it constructs the very nature of the thinking process. Again this points to the centrality of student-teacher interaction in the classroom, and to the central concerns of this study.

Drawing on the example of a practical apprenticeship, Vygotsky argues that a learner learns through the joint participation with an 'expert' how to use material tools to create a concrete artefact. Central to this view of learning as a mode of apprenticeship is Vygotsky's notion of the "zone of proximal development" (ZPD), which refers to a 'cognitive gap' which exists between what an individual can do alone and what they can do jointly and in coordination with a more skilled expert, "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more able peers" (Vygotsky 1978, p. 86). Successful coordination with the partner leads to the novice reaching beyond what they are currently able to achieve alone, to enter into new situations, to participate in new tasks, to learn new skills, or, as is the focus of this thesis, to learn new ways of using language. Bruner suggests that the ZPD "has to do with the manner in which we arrange the environment such that the child can reach higher or more abstract ground from which to reflect, ground on which he is enabled to be more conscious", a view of the ZPD which has clear implications for teaching (Bruner 1985, p. 24). Within the SLA area, related notions to that of the zone of proximal development have also been suggested, for example, Krashen's "input hypothesis" and the notion of I+1 (Krashen 1985), Prabhu's "reasonable challenge" (Prabhu 1987) and Swain's "pushed language" (Swain 1985).

The process of learning in coordination with a more skilled individual underpins an often quoted Vygotskian maxim: that what a child can do today in cooperation, tomorrow they will be able to do on their own (Vygotsky 1962). Vygotsky argues that "the only 'good learning' is that which is in advance of development" (Vygotsky 1978, p. 89). The idea that education *leads* development is a significant one in the pedagogical context, and one which problematises the idea of 'developmentally appropriate practice'. As discussed earlier, currently this is often defined in Piagetian terms by what the learner is able to do independently, which may encourage some teachers to wait until a particular behaviour or skill emerges before

planning specific activities to encourage it (Bodrova and Leong 1996). While some perspectives on education, such as hierarchical mastery-learning programs, suggest that a well-designed task is one which a student should be able to complete with minimal or no intervention, Vygotskian theory suggests that it is only *when* teacher support is needed, that learning will take place, since we can then infer that the learner is working within their zone of proximal development (Mercer 1994). Chapter 6 focuses on the nature of that support, defined as scaffolding. The ZPD has both theoretical and practical implications for education. The theoretical significance lies in the fact that it represents a way of conceptualising the teaching/learning relationship. The pedagogical significance lies in the fact that it represents the potential for a student's intramental development which is created by the intermental interaction that takes place as the learner and teacher cooperate on the task. The theory therefore has room for teachers as well as learners, since a learner's achievement can never be seen as solely the result of their innate ability, but as a measure of the nature and success of the interaction between teacher and student. This has considerable implications for the teaching of minority students, which is discussed further later in this chapter, and for the role of the teacher, which is explored in Chapter 6.

Wells argues that as apprentices learn to use material tools to construct an artefact, so too do children, through social interaction with others who are more skilled, learn to use "the language toolkit", the genres of the culture, in order to achieve specific social purposes (Wells 1996). These cultural tools, manifested through interaction in the case of language learning, will later be appropriated by the individual to construct the psychological tools for intramental activity. In the school context:

> ... spoken discourse has an essential role to play in mediating the pupil's apprenticeship into a discipline, both as a medium in which to respond to and prepare for work on written texts, and ... as an opportunity for 'talking their way in' to ways of making sense of new information ... in forms that, with the assistance provided by the teacher, gradually incorporate the essential features of the discourse of the particular discipline.
> (Wells 1992, p. 291)

Similarly it has been argued that the technicality and abstraction that are integral to the specific subject discourses of school should be seen as "tools", through which the subjects can be explored and understood (Martin 1989; Martin et al 1987). The

data in the current study illustrate some of the ways in which teachers begin to introduce students to the technicality and abstractions of the science curriculum.

At first sight Vygotsky's theories appear to emphasise cultural reproduction at the expense of cultural challenge and change, a criticism which has also been levelled at some of the educational initiatives that have grown out of genre theory. However Vygotsky argues that the inclusion of tools in action does not simply facilitate action but transforms it in a fundamental way, just as a technical tool might impact on the form of labour operations (Vygotsky 1981). Bruner argues along similar lines that language is "not only the medium of exchange [in teaching] but the instrument the learner can use himself in bringing order into the environment". He adds:

> Much of growth starts out by our turning around on our own traces and recoding in new forms, with the aid of adult tutors, what we have been seeing or doing, *then going on to new modes of organisation with the new products that have been formed by these recodings.*
> (Bruner 1966, cited in Barnes 1992, p. 123, my italics)

The data discussed in Chapters 5, 6 and 7 illustrate how the process described by Bruner occurred in the two classrooms studied.

While it is true that one function of a text is to enable a listener to reconstruct the speaker's intended meaning, it also provides opportunity for generating new meaning (Wells 1992). Addressing this issue, Wertsch and Toma (1991) propose an extension of the Vygotskian framework drawn from the work of Lotman (1988), which argues for a recognition of the dual function of texts: the univocal function which focuses on conveying meaning, (referred to earlier as the 'conduit' view of communication), and the dialogic function which is concerned with how new meanings are generated. The dialogic nature of texts suggests that "a text ceases to be a passive link in conveying some constant information between input (sender) and output (receiver)" (Lotman 1988, p. 41). Whereas the univocal view of text sees a difference between the sender's message input and the receiver's message reception as a defect in the channel of communication, a dialogic view would see such a difference as "the very essence of a text's function as a 'thinking device'" (Lotman 1988, p. 41). Within this view, change, creativity and diversification are of the essence of interaction (Wells 1995). A dialogic perspective assumes that voices, the perspectives of others, come into contact with each other through dialogue and that through this contact there is opportunity for the interactants to treat each other's

contributions as 'thinking devices', by, for example, extending, exploring or critiquing them. In the classroom:

> it is reasonable to expect that when the dialogic function is dominant ... pupils will treat the utterances of others as thinking devices. Instead of accepting them as information to be received, encoded and stored, they will take an active stance toward them by questioning and extending them, by incorporating them into their own external and internal utterances and so forth. When the univocal function is dominant, the opposite can reasonably be expected to be the case.
> (Wertsch and Toma 1991, p. 13)

While both univocal and dialogic functions of text exist, Lotman argues that one or other tends to dominate in particular areas of activity. It can be argued that for many years it has been the univocal function of texts, rather than their function as a thinking device, which has dominated much western educational practice. In a classroom where the univocal function of texts dominates there are few opportunities for students to question incoming curriculum knowledge (Young 1994). Tharp and Gallimore (1988) argue that the predominantly univocal function of text in classrooms now needs to be balanced, with more weight being given to the dialogic function. Recently this balance has begun to be rectified, with increasing recognition of the dialogic function of spoken discourse, and its role as a mediating tool for learning and for the development of cognition, reasoning and critical thinking, (see, for example, the work of the National Oracy Project in the UK described in Norman 1992). With this recognition has come a challenge to univocal transmission-based views of language and knowledge from many educationists who, though their primary concerns may be different, argue in common from the perspective of a more dialogic and discursive approach to classroom discourse (see, for example, Edwards and Mercer 1987; Lemke 1990a; Walsh 1991; Young 1992; Wells 1992; Corson 1993; Stierer and Maybin 1994; Edwards and Westgate 1994; Mercer 1995; Cummins 1996; Webster et al 1996).

A constructivist and neo-Vygotskian approach to pedagogy: some implications for teaching and learning

Constructivist or neo-Vygotskian approaches to pedagogy view teaching and learning as socially mediated activity (Wood 1988; Bruner 1986), reflecting Vygotsky's claim that "human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them"

(Vygotsky 1978, p. 88). Knowledge is seen as jointly constructed through discourse to become shared "common knowledge" (Edwards and Mercer 1987; Mercer 1995), and learning is viewed as an interactive and communicative activity (Webster et al. 1996). As discussed in the previous section, Vygotsky argues that the cultural legacy of a society is expressed and mediated through the tools that have been developed to aid in the social activities in which people take part, the most significant tool being language. Within one social institution, that of the school, this cultural legacy includes the cognitive understandings and discourse of the disciplines that make up the curriculum. The nature of social activity is constrained and defined by the social practices of the cultural institution; thus in school, children's learning is based on the mastery of the language, behaviour, attitudes and thought as defined by the social practices of the school. Teaching and learning can be interpreted therefore as the cognitive and linguistic socialisation of students; education involves the process of initiation of students by their teachers into the common knowledge which comprises educational discourse (Edwards and Mercer 1987; Stierer and Maybin 1994; Mercer 1995; Webster et al 1996), (although, as earlier discussion has suggested, this is not incompatible with the notion of also transforming social practices).

Neo-Vygotskian approaches to education, or socio-constructivism as a pedagogical theory, are characterised by three notions drawn or inferred from socio-cultural and Vygotskian theory (Mercer 1994; Webster et al 1996): *the zone of proximal development, scaffolding* and *appropriation*. Webster et al also discuss the related notions of *mediation* and *contingency*. These five constructs are briefly discussed here, and together provide some of the tools for the analysis of discourse in Chapter 6, where their realisations in classroom discourse provide for further discussion and theorisation.

The zone of proximal development

As discussed earlier, the notion of the zone of proximal development is central to a neo-Vygotskian or constructivist view of learning, and refers to the cognitive gap between what an individual can do alone and what they can achieve jointly with the help of someone more skilled. It provides a distinctly different perspective from that provided by Piaget, and has considerable implications for the role of the teacher and the nature of the teaching/learning relationship. Bruner explains the 'expert's role as "serving the learner *as a vicarious form of consciousness* until such time as the learner is able to master his own action through his own consciousness and control" (Bruner 1985, p. 24, my italics). It should be reiterated at this point that the

zone of proximal development is not an attribute of the individual learner, in the way, for example, that IQ is assumed to be, rather it is the product of a particular situated task, an attribute of the event. What the learner may need maximum help with today may require minimum help later: development involves a series of constantly changing zones.

One implication of the socially situated nature of the ZPD for pedagogically relevant educational research, is that the processes of learning and teaching should also be examined as they are manifested in these events. The paradigm for such research is not to be found in the quantitative experimental work of psychology but within qualitative, ethnographic analysis of classrooms, approaches which are also more congruent with the emphasis on the social, cultural and linguistic factors found in Vygotsky's work (Mercer 1994). This issue is taken up further in Chapter 3, in the discussion of the methodology used in this study.

Scaffolding

Closely allied to the construct of the ZPD is the notion of scaffolding, a term originally used by Wood, Bruner and Ross (1976) in their examination of parent tutoring in the early years. Bruner describes scaffolding as "the steps taken to reduce the degrees of freedom in carrying out some tasks so that the child can concentrate on the difficult skill she is in the process of acquiring" (Bruner 1978, p. 19). In the classroom it portrays the "temporary, but essential, nature of the mentor's assistance" in helping learners "move towards new skills, concepts or levels of understanding" (Maybin et al 1992, p. 186). There are, however, distinctions to be made between what counts as scaffolding and what is simply 'help' (Maybin et al 1992; Mercer 1994; Webster et al 1996). These issues are discussed further in Chapter 6.

Contingency

A fundamental factor in effective scaffolding is the notion of contingency. Van Lier claims that "it lies at the core of the Vygotskian socio-cognitive interface" (van Lier 1996, p. 169). Contingency is characterised by how well an adult judges the need and quality of assistance required by the learner, and relates to the way in which the amount of help is *paced* on the basis of moment-to moment understanding, so that within the classroom, teachers will allow room for learner initiative as a new task is grasped, but will provide intervention when learners begin to falter. Contingency emphasises the importance of teaching strategies being based on and responsive to learners' current understandings. The sensitivity and skill involved in

responding contingently to students has been seen as the defining quality of effective teaching. Webster et al suggest contingency is "arguably the most important quality for teachers to have in enabling children to take control of their own learning" (Webster et al. 1996, p. 151). Van Lier suggests that "even though it does not show up in lesson plans or syllabuses, this local or interactional scaffolding may well be the driving force behind good pedagogy, the hallmark of a good teacher" (van Lier 1996, p. 199). Wells refers to it as "the craft of teaching" (Wells 1996, p. 84). The importance of contingent responses is discussed further in Part 2 of this chapter in relation to second language learning and to the role of collaborative meaning making in language development.

It is perhaps a limitation of the concept to think of contingency solely in terms of the moment-to-moment support given by a teacher. Webster et al argue that contingency depends broadly on two factors:

> One is the adult's image or idea of the problem to be tackled: the theory of the task. The second is the teacher's image of the children, their prior knowledge, experience and capabilities: the theory of the learner. These two images or theories influence how the adult sets up activities, resources and expectations, and how learning transactions are conducted. In other words, these images determine how successful the teacher's scaffolding will be.
> (Webster et al 1996, p. 73)

Taking into account these two factors, the notion of contingency encapsulates long-term planning too, since this involves the way in which teachers plan the teaching program and design activities tailored *both* to the needs of the group *and* the demands of the school curriculum (Gibbons 1991).

Here again it is possible to make a further distinction between progressive and constructivist approaches. Progressive approaches are characterised, at least theoretically, by the significance of the teaching 'moment' with individual students. What is foregrounded is contingency in the sense of the here-and-now, and little is said about how this might relate to preplanning by the teacher. Indeed it is claimed that "traditional approaches to programming — preplanning a common set of learning tasks or activities — becomes a logical impossibility", on the grounds, for example, that "it is naive to think ... that all learners will need a demonstration on the same day at the same time of how full stops are used" (Cambourne 1988, p. 63). While Cambourne makes it clear he does not mean that young learners are entirely

responsible for their own learning, he does argue that students' literacy development is facilitated if the conditions in which children learn to speak are simulated in the classroom, and these conditions do not of course include deliberate planning on the part of the child's caregivers. In contrast, in this study, teachers gave considerable thought to long-term planning (see Chapter 3 for a brief description of the classroom programs).

In relating moment-to-moment contingency to broader levels of planning, Wells' distinction between the macro and micro-levels of teaching is useful here (Wells 1996). The macro-level is based on the teacher's knowledge of students' interests and current levels of participation and their expectations of the semiotic resources which students will need to draw on in the curriculum units in which they will be involved. Thus it corresponds, in Webster's terms, with the theory of the learner and the theory of the task and with the 'needs and demands' model proposed by Gibbons (1991). The micro level can be characterised in terms of response, where having set up the context the teacher acts to assist students as this is needed. It is at this micro level of teaching where teachers are most likely to be operationalising the notion of working in a zone of proximal development, but ensuring that this is *likely to occur* is a central part of the planning that Wells refers to as the macro-level of teaching. It is the micro-level however which is the main focus of this study, "the moment-by-moment co-construction of meaning, in the sequences and episodes of discourse" (Wells 1996, p. 84). It is perhaps through the use that teachers make of opportunities for responsive follow-up to students' contributions that they are most able to effectively facilitate students' entry into the new ways of meaning characterised by school learning.

The notion of contingency in relation to classroom interactions is further analysed and theorised throughout this study.

Appropriation

The term appropriation was proposed by Leont'ev (1981) to describe how the objects in the child's world, and his or her ideas and language use, have their origins in the child's social and cultural history. Children appropriate the ideas, understandings, attitudes and discourse of those with whom they share a social and cultural context. Bakhtin (1981) likewise suggests that we take on and reproduce other people's voices through using their words in our own speech or through the use of reported speech; as Maybin expresses it "we learn words not from dictionaries but from people's mouths, and these words are always

overpopulated with the meanings of others" (Maybin 1994, p. 132). Maybin's study of children's conversations illustrates how they report and take on other people's voices. She concludes:

> individual thought processes ... involve the taking on of voices which provide responses to voices heard in previous conversations, and which call up particular relationships and contexts.
> (Maybin 1994, p. 146)

The dialogues we have taken part in, and those we might have with people, "feed into our internal thought processes", a process closely resembling Vygotsky's notion of inner speech.

In the school context, children appropriate ideas and concepts from their teachers via the spoken and written discourse in which they are engaged. Newman, Griffin and Cole (1989) extend the notion of appropriation by pointing to its reciprocal nature. In their interactions with students, teachers also appropriate ideas from their students, by taking up an utterance, modifying it to more closely fit the educational discourse in which they are engaged, and returning it to the ongoing discourse in its recontextualised form, thereby "offering children a recontextualised version of their own activities which implicitly carries with it new cultural meanings" (Mercer 1994, p. 105). A teacher's ability to pick up on students' ideas and responses, and adjust their teaching accordingly, is an important factor in contingency (Webster et al. 1996). It can also be argued that in the context of the classroom appropriation is not truly reciprocal. Students and teachers have differing amounts of control over what ultimately gets recontextualised into the academic discourse and students do not have the same responsibility, nor an equal entitlement, to recontextualise into the ongoing discourse anything that is said by the teacher. Nevertheless, the notion of reciprocal appropriation is a useful one to characterise what many skilled teachers do intuitively, that is, to draw into the discourse aspects of students' meanings, for the purpose of moving towards their own educational objectives. The discourse which is co-constructed in this way bears 'traces' of students' meanings while in the process of becoming the authoritative discourse of the subject. Chapters 5 and 6 draw on the notion of appropriation and explore further how it is realised through the discourse.

Mediation

The concept of mediation is multi-layered, and can broadly be characterised as occurring in contexts characterised by difference, difficulty or social distance (Baynham, forthcoming): a lawyer, for example, acts as a 'go-between' in mediating between a client's account of an event and the language principles and categories of the legal world required in court (see for example Maley, Candlin, Crichton and Kostler 1995). Vygotsky writes of tools mediating activity, the most versatile and extensive tool being language. Wells (undated paper) argues for the mediating role of the act of writing in knowledge building. In the context of the school, discourse can be viewed as a mediating tool between the current levels of learners' knowledge and the broader knowledge of the community of scholars into which they are being apprenticed. In Chapter 6 it is argued that teaching itself can be viewed as a process of mediation. In the knowledge and linguistic asymmetry between teacher and students, often characterised by social distance or linguistic or conceptual differences, the teacher's role involves the building of linguistic bridges to span the 'yawning gap' to which Barnes (1976) refers. Mediation in this sense involves a linguistic process in which students' contributions to the discourse of the classroom are progressively transformed into the specialist discourse of the school curriculum. In the process of formal education, teachers mediate between the current linguistic levels and the 'commonsense' understandings of their students, and the educational discourse and specialist understandings of the subject disciplines. In the shorter term, each lesson is a process of mediation, with the teacher mediating, through the scaffolds she provides, the new educational knowledge which the students are in the process of developing. This notion of the teacher as a 'mediator' is therefore closely allied to an understanding of their 'expert' role as guide in the learning partnership discussed earlier in this section, and is taken up further in Chapter 6.

To conclude this section, the opportunities presented by these aspects of Vygotskian theory for theorising pedagogy will be considered, and some directions in which further developments need to occur will be suggested.

Theoretical implications of a neo-Vygotskian approach

First, a neo-Vygotskian approach appears to be theoretically better equipped to develop the kinds of reasoned thinking that much educational rhetoric supports. Once again the point of difference with progressive approaches needs to be considered. The notion of 'construction' in progressive approaches is allied to the psychological view that the learner 'constructs' their own knowledge through their

interaction with the environment: in Piagetian terms, the learner is described as the 'architect' of their own understanding. Constructivism in the sense in which I am using it here, (to refer to neo-Vygotskian approaches) is founded on what earlier discussion has shown to be a very different view of learning. Knowledge construction in a neo-Vygotskian approach implies the presence of two 'architects', the teacher *and* the learner, in a collaborative learning partnership. We would therefore expect the difference between the two approaches to be evident in teacher-student interactions, and in particular in the way that teachers choose to respond to students. It is in what counts as an 'effective' response that the differences between the two approaches are perhaps most evident. Like progressive approaches, neo-Vygotskian approaches view what the learner already knows or can do as a starting point for teaching: this is inherent in the notion of the ZPD. Thus the kind of hands-on activities that often characterise progressive approaches are not incompatible with neo-Vygotskian approaches. Where the approaches differ at the theoretical level is the role that the teacher plays in this learning and the degree to which the function of personal learning is made explicit. As discussed earlier, progressive methods stress the value of allowing children to work things out for themselves, to learn by doing. Neo-Vygotskian constructivist approaches, however, place interactions between teacher and students at the heart of the learning process.

One of the dangers of seeing learning as essentially about personal experience and activity, is that understanding can remain at the level of the specific example and procedure, rather than forming the basis of more principled understandings (Edwards and Mercer 1987). In this example, where a young student is explaining how she gets good marks for mathematics, procedural knowledge has become ritual and replaces an understanding of underlying principles:

> I know what to do by looking at the examples. If there are only two numbers I subtract. If there are lots of numbers I add. If there are just two numbers and one is smaller than the other it is a hard problem. I divide it to see if it comes out even and if it doesn't I multiply.
> (Taba and Elzey 1964, cited in Edwards and Mercer 1987, p. 95)

Principled knowledge on the other hand is "essentially explanatory, oriented towards an understanding of how procedures and processes work, of why certain conclusions are necessary or valid, rather than being arbitrary things to say because they please the teacher" (Edwards and Mercer 1987, p. 97). A neo-Vygotskian approach may have been more successful in helping the mathematics student develop an understanding of the principles underlying the procedures she had

ritualised, because through dialogue between teacher and learner, different interpretations can be brought into the open, the basis for a student's beliefs can be explored and reasons can be made explicit. Dialogue provides evidence for the teacher to find out the learner's current understandings and prior knowledge, an essential aspect of the ZPD, and of effective and contingent scaffolding. One function of the dialogic approach is to build the principled understanding to which Edwards and Mercer refer. Through interaction with students teachers can tap into their world view, and provide contingent support where students need help in modifying, changing or challenging their thinking. Although it cannot of course be claimed that such dialogue does not occur within the other pedagogical orientations discussed, it can be argued that neither transmission not progressive approaches are as *theoretically* well-equipped to address the development of principled learning.

A second area of potential for neo-Vygotskian theory is related to the somewhat schizophrenic approach to teaching and learning which has characterised the way in which western educationists have tended to treat pedagogy. Theories of learning and studies of teaching method are often seen as quite separate entities, and pedagogical theory has tended to foreground one or the other: transmission-based approaches focus primarily on teaching, and progressive on learning. A model of the learning process is still to be developed "which can accommodate the teacher as active participant, as opposed; for example, to a custodian of stimulating environments" and which "offers an alternative to the tired debate about 'traditional versus progressive' pedagogies" (Maybin et al, p. 187). It is significant that the Russian word *obuchenyie* refers to both teaching and learning. A socio-cultural theory of pedagogy offers a more unified view of teaching and learning, in that it describes active roles for both learner and teacher within the kind of learning partnership theorised by Vygotsky. Teaching and learning is construed as "a social enterprise which draws on the immediate resources of the participants" (Webster et al, 1996, p. 42), that is, the resources of *both* participants. This study explores how the expertise of the teacher and the resources of the learner can be brought together for the purposes of language development.

The theory also encompasses an inherent and problematic characteristic of the reality of the classroom, that is, the generally asymmetrical distribution of power and knowledge that exists between the participants. One response to how pedagogy should handle the existence of the asymmetrical relationship in general, is again to foreground the active and interrelated nature of the roles of teacher and student, or, as Bruner argues, "to treat the zone of proximal development in terms of its general conception as the structure of joint activity" (Bruner 1985, p. 155). The

nature of the partnership described by Vygotsky and referred to here by Bruner, addresses and theorises the asymmetrical relationship, indeed depends on it, in a way that fosters rather than hinders learning (Edwards and Mercer 1987; Stierer and Maybin 1994).

A neo-Vygotskian approach is also significant in representing a move away from the notion of learners as lone organisms who succeed or fail on their own resources, (such as their innate cognitive abilities and home backgrounds), towards a view of learning as a situated, culturally contextualised process where learners' achievements or failures are at least in part due to the strength of the cultural and linguistic frameworks in which learning is embedded (Mercer 1994). Educational successes or failures must therefore be viewed as depending in part on the quality of the contributions of others, and this positions the learner very differently from the way they are positioned by psychologically-oriented pedagogical models. As Part 3 of this chapter will suggest, neo-Vygotskian approaches are congruent with the views of those working in minority education who seek to avoid 'blaming the victim'.

There are a number of questions raised by this discussion, some of which this study seeks to address. First, although in their present state of development, the construct of the ZPD, and the notions of scaffolding, contingency, appropriation and mediation offer valuable insights into the nature of teaching and learning (Mercer 1994), they have yet to be thoroughly examined in the classroom context (Webster et al 1996). This study seeks to contribute to such an examination. More broadly, at the present time a coherent theory of teaching and learning as social practice has still to emerge (Mercer 1994). The theoretical framework presented in Vygotsky's work needs to be pushed further to take account of how the ideas which stem from it can be applied to a large group context, and educationists have yet to directly apply many of the ideas to the classroom (Mercer, 1994; Webster et al 1996), and to illustrate and extend them with reference to the ways in which adults respond to children in busy school contexts (Webster et al 1996). Again the study seeks to provide such an illustration. One way in which this can be done is through the analysis of instances of classroom practices, in particular the micro-interactions between teachers and students, which, when theorised, will offer insights into the development of a theory of teaching and learning as social practice. The study seeks to develop some such insights by focusing on the micro-interactions between teacher and learner.

As it stands, neo-Vygotskian theory is a powerful tool in helping educationists and researchers to interpret actual classroom processes, and to explain the processes of

teaching and learning as researchers view them. Edwards and Mercer (1987) and Stierer and Maybin (1994) have illustrated through detailed analyses of transcripts how teachers and learners together reach common understandings, and how the process of education can be viewed as a process of cognitive socialisation through language. However an educationally relevant theory should not only enable researchers to describe what they see, but also to evaluate and model the processes of teaching and learning, and ultimately to make some contribution to the debate about what constitutes 'effective' practice. In the analyses of instantiations of practice, which, it has been argued, are necessary to help develop the theory, might also lie insights into new possibilities. It has been argued that the univocal function of texts has dominated western teaching practices for too long, and that pedagogical theory needs now to take a greater account of the dialogic function. It is within instances of teacher-student interactions that models may be found of how such discursive approaches might be represented in practice. Such instances may be rare, but:

> better practice, practice which is better than common practice, is rare, almost by definition, but at any given level of development, it is to the higher but still infrequent levels of practice that we must look.
> (Young 1992, p. 122)

Perhaps it is these infrequent practices which will point the way to what can be: what might be possible can be surmised from what is actual.

In summarising the ideas that have been discussed in this section, three major principles can be foregrounded (Wells 1992). The first is that knowledge is not a commodity existing independently of particular knowers. The second is that although knowledge becomes an individual resource, the process of knowledge construction is social and cultural in nature. The third is that problem-solving and learning is mediated by cultural artefacts and practices, the most important of which is discourse. It has been suggested that this theory, if followed through to its logical conclusions, "is likely to bring about a revolution in classroom practice" (Wells 1992, p. 286).

It remains the task for researchers and innovative teachers to suggest what that classroom practice might look like, and how its pedagogy is to be theorised.

PART 2: PERSPECTIVES FROM SECOND LANGUAGE ACQUISITION RESEARCH

Introduction

Part 2 considers the possible directions for teaching which are offered by Second Language Acquisition[2] (SLA) research. In addressing this question, it is necessary first to consider briefly the relationship between SLA theory and pedagogical practice.

Nunan points out that many second language researchers are "cautious about deriving pedagogical implications from their research" (Nunan 1991, p. 2). Some researchers feel that research to date does not provide an adequate enough description of what happens in the acquisition process, or an explanation of how. More important, there is as yet no generally agreed theory of SLA, although there is a myriad of models, frameworks and principles (Breen 1985; Long 1993; Gregg 1993; Ellis 1994; Lantolf 1996; Block 1996)[3]. From this range of theories it appears unlikely that a single theory can explain the acquisitional process and more likely that it is a consequence of a number of factors.

More relevant for this study, many theories make no specific comments about classroom learning, either as relevant data or as relevant application. Perhaps what underlies this reluctance to apply theory to practice is not only the lack of a commonly agreed theory, but also the extent to which SLA research has largely taken place in sites which are not themselves genuine classrooms, and the extent to which the research approach has been quantitative and experimental rather than qualitative and descriptive. Lantolf for example writes of the "commitment to the rationalist epistemology and ... the positivist legacy that continues to pervade SLA studies" (1996, p. 74). Clarke argues that research in language acquisition "contributes only a narrow range of insights to L2 teachers, primarily because the classroom, which is the primary venue for SLA, is explicitly excluded from consideration" (Clarke 1994, p. 15). This is reflected in a survey of fifty studies on second language acquisition, where it was found that only fifteen were actually

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[2] The term *acquisition* is discussed in the conclusions of this study, where it is argued that the term *development* is more appropriate within a model of language learning which foregrounds the social nature of the phenomenon. The term *acquisition*, however, is retained at this point.

[3] See also the special issue of Applied Linguistics in September 1993, edited by Alan Beretta, which is devoted to theory construction in SLA.

carried out in authentic language classrooms (Nunan 1991). Twenty eight of the studies were carried out in classrooms constituted for the purpose of research, and the remaining seven were in a mixture of the two environments. In this situation it is not unreasonable to argue that generalisations made in one context, an experimental one, may not be directly applicable to the context of the authentic classroom.

The assumption underpinning many debates (not only those in the SLA area) on the relationship between theory and pedagogical practice is that theory informs practice, a kind of temporal metaphor. There are a number of alternatives to this view both of theory construction and of the uses of theory. The following chapter in this study argues that practice itself can be theorised, and it is this view which has governed the process of this research. Widdowson (1990a) suggests that because the procedures involved in conducting research and in language teaching are not the same, the direct application of theory and research to language pedagogy is impossible. He argues instead for teacher education to take the form of discussion of current pedagogical issues informed by generalities and principles drawn from research. Ellis suggests that applying the results of SLA research means examining aspects of language teaching to see how they might be made more relevant and efficient by attending to what is known about how learners learn a language (Ellis 1987). He argues that SLA studies provide a body of knowledge which teachers can use to reflect on and evaluate their own pedagogic principles, enabling them to "examine critically the principles upon which the selection and organisation of teaching have been based and also the methodological procedures they have chosen to employ" (Ellis 1994, p. 4). He points out that SLA does not provide teachers with recipes for successful practice, since there is no comprehensive theory of SLA. Instead:

> SLA research should be treated as providing teachers with *'insights'* which they can use to build their own explicit theory. It is on the basis of this theory — not on the basis of SLA research itself or any theory it has proposed — that teaching practice should proceed.
> (Ellis 1994, p. 4, my italics)

Chapter 7 of this study examines sections of discourse and interprets these in relation to what current SLA research suggests is significant in language learning. Existing theory then offers a tool for providing a richer insight into the interpretation of authentic classroom data, thus (in this study) allowing for further theorisation of practice. From an SLA perspective this approach has additional value: the data has the potential to illustrate how theory may get realised in practice, thus 'fleshing out'

the bones of SLA theory. On the one hand, then, the relationship of SLA theory to specific texts within the data is one of instantiation. The study however aims to do more than simply flesh out SLA insights. The theory/praxis nexus can be more dynamic and interesting than this suggests: praxis itself can be theorised. This theme is taken up in the following chapter.

This section of Chapter 2 seeks to determine the kinds of pedagogic practices, and in particular discourse practices, which might be found in a classroom which is an 'acquisition rich' environment for language learning. It will draw on SLA research to suggest what kind of classroom organisation and grouping patterns are most pedagogically effective, and what overall patterns of classroom discourse and characteristics of teacher talk might be expected to promote learning. While the SLA field is large and its boundaries not always clear (Ellis 1994), the review is restricted to research which addresses these pedagogical issues. It includes both research which is broadly psycholinguistic in orientation and research which takes a more sociolinguistic orientation. The first tends to focus on the processes that learners appear to use to make sense of and produce the new language. The Chomskyan tradition has figured strongly in such research, and within this tradition linguistic knowledge is separated from its use in social interaction, thus little or no account is taken of the role of context. The second, research which takes a more sociolinguistic orientation, focuses on the role of context, interaction and socialisation in second language learning. Such research sees language, and language learning, as shaping and being shaped by wider contexts of use. Earlier SLA research largely focused on the former approach, and was aimed at developing understanding of the individual mental processes involved in language learning. Later research, influenced largely by research in the social sciences, has included an emphasis on the communicative and social aspects of language as one of the keys to successful second language learning, suggesting that an understanding of mental processes alone is not sufficient to account for individual or group variations in language learning outcomes. The position taken in this study is that a theory of practice needs to include both the mental and the social-interactive aspects of learning. Both are of relevance in exploring the notion of an 'acquisition-rich' classroom. The primary focus in this study, however, is on the latter.

The first section of Part 2 of this chapter focuses on more theoretical issues of second language acquisition research (that is, it does not address specifically pedagogical issues). It considers in particular the significance to language acquisition of input, of learner output, and of interaction. While some of this research was carried out in classrooms, much of it is aimed primarily at contributing to an

understanding of the SLA process itself. As such, however, it carries important implications for pedagogy. The second section addresses some more directly pedagogical aspects of second language acquisition, such as class organisation and grouping patterns, the construction of learning tasks, and the relationship between 'language' and 'content' where the second language is the medium of education.

Aspects Of Second Language Acquisition

The Role of Input

It has been claimed that comprehensible input is the major factor in second language acquisition (Krashen 1981, 1982, 1985, 1988, 1989). Among the claims put forward by Krashen in the input hypothesis are the following. 'Acquisition' occurs subconsciously when learners are focusing on meaning rather than accuracy, and this subconscious 'acquisition', rather than conscious formal 'learning', is responsible for successful language learning. 'Acquisition' is identical in all major ways to the process by which children learn their first language, and there is a natural order of acquisition through which learners progress as a result of comprehending the input to which they are exposed (Dulay, Krashen and Burt 1982). The language teacher does not need to explicitly teach the next structure within the learner's natural sequence; if the input is understood, and there is enough of it, the necessary grammar is automatically being provided (Krashen 1981). In addition to being comprehensible, input must also contain structures which are a little ahead of the learner's current level of competence, which Krashen refers to as 'I plus 1'. Learners need to be in environments in which they are not anxious, so that they are 'open' to the input, and have many opportunities to practice language in personally rewarding situations. In situations of stress or anxiety, Krashen posits that the learner's 'affective filter' will block the input from reaching the internal language processor, which Chomsky (1965, 1980) describes as a 'language acquisition device'. The input will be comprehensible, even though it may contain as yet unacquired grammar, with the support of extra-linguistic contextual clues (such as pictures), the learner's knowledge of the world, and their previously acquired linguistic knowledge and familiarity with the subject matter. Oversimplification of grammar on the other hand may make language less comprehensible because it may remove important cues to meaning, and may not aid acquisition because it does not provide the learner with I plus 1. Most relevant to the concerns of this study is the role of talk in language development. In Krashen's view, speaking is simply an outcome of learning, and not a contributing factor to learning (1982, 1985,1989). The current

study challenges this view by demonstrating the significance of talk for learning and language development.

Krashen's claim for the input hypothesis as a *theory* of second language acquisition (1985) has led to considerable debate among and challenge from other researchers, most notably Gregg 1984, and in addition Swain 1985, 1995a; Sharwood Smith, 1986; White 1987; and Ellis 1991. In particular, Gregg points to Krashen's lack of linguistic theory which he argues must be included in any valid theory of SLA, an issue which is also addressed in this study. There is also the question of how a direct relationship between input and acquisition can be shown. While a number of studies suggest that there is a correlation between input and acquisition (see for example Larsen-Freeman and Long 1991), there is little direct evidence that the input either causes or results in acquisition. White (1987) argues that it may be the *failure* to understand input that sometimes leads to learning, since this may encourage the learner to pay more attention to a target structure in order to more effectively work out its meaning, a point which is later taken up in the discussion of Swain's work on output. Faerch and Kasper (1986) argue similarly that it is only when the learner *perceives* the gap between the input and their own interlanguage (learner-language), that acquisition will take place. As Ellis (1994, p. 247) states, "it is probably not 'raw' input but 'heeded' input that works for language acquisition". Thus comprehensible input should be seen as playing a facilitative role in acquisition, rather than being seen as sufficient in itself for acquisition to occur.

Related to the input hypothesis is the interaction hypothesis (Long 1981, 1983; Pica 1987). Long draws a distinction between comprehensible input as facilitating learner *comprehension*, and comprehensible input as *causing* second language acquisition to occur. While accepting the notion of comprehensible input as significant in language acquisition, he extends Krashen's notion of how it is provided by focusing on the importance of two way interaction, (and hence acknowledging a role for learner output). A critical factor in the provision of comprehensible input appears to be the interactional modifications which occur as a result of communication breakdown (Long 1981; Pica 1987; Ellis 1991). Pica, Young and Doughty (1987) also show that mutual understanding can be reached when the learner and interlocutor modify and restructure their contributions to the interaction through clarification requests and confirmation checks. Their study demonstrates how interactionally modified input, where the initial input was unmodified but where learners were free to seek clarification from each other, led to a greater degree of comprehension than input which had been premodified. Although their research does not demonstrate a direct relationship between modified interaction and

language gains, it does suggest that interactional modifications can maximise the potential of comprehensible input for language acquisition. Later studies (Pica 1994; Pica, Lincoln-Porter, Pasinos and Linnel 1996) also suggest that when learners modify their interactions through negotiation, opportunities for language learning are increased. This issue is explored further in the current study.

If comprehensible input is a necessary condition for SLA, then, its provision needs to be seen in terms of the negotiation of mutual understanding rather than simply in terms of simplified input. It is also likely that it is the quality rather than the quantity of interactional modifications which is significant for comprehension. A more important issue for pedagogical purposes is perhaps not whether comprehensible input is necessary, but what form it should take for acquisition to occur (Ellis 1991).

While there may be only limited evidence to support the input/ interaction hypothesis as a theoretical construct, it has strong face validity: most teachers accept as commonsense the view that making learners understand what is said to them will help them to learn the second language. Rather than abandoning the hypothesis, therefore, Ellis (1991) proposes that what is needed is a theoretical account of how input which has been made comprehensible through interactional modifications might result in second language acquisition. He proposes a three part process to account for the process of language acquisition: noticing, comparison and integration. 'Noticing' refers to the process by which learners pay attention to specific linguistic aspects of the input, which Chaudron (1985) refers to as 'preliminary intake'. Noticing is discussed further in the following section on learner output. 'Comparison' entails the learner identifying the difference between the linguistic feature which has been noticed, and their own interlanguage. 'Integration' occurs as the learner constructs a new hypothesis on the basis of this comparison, what Chaudron refers to as 'final intake'. The role of input derived from interaction is thus that of facilitating the initial processes of noticing and comparison. Schmidt (1990) suggests that noticing can take place either intentionally or inadvertently, but argues that learners who notice the most, learn the most.

There remains the question of what causes a learner to notice features in the input and then compare them. Ellis (1991) suggests that modified input might do this in two ways. It may increase the frequency of specific forms, and it may also construct the message in such a way that specific linguistic features become salient to the learner, as in this example:

NNS: No go disco this Saturday.
NS: Oh, you're not going to the disco this Saturday?
NNS: Yeah, not going.

He comments that:

> In such an exchange the native speaker reformulates the learner's utterance in the guise of a confirmation check and one feature of this reformulation is taken up in the learner's response. Such interactions afford the learner overt comparisons between interlanguage[4] and target language forms.
> (Ellis 1991, p. 200)

Interactions involving reformulation by one or both of the interactants appear to be significant in both first and second language learning. It is worth noting that the importance of responsiveness by the child's interactant, in both mother tongue and second language acquisition research, is implicit in the notions of 'recasting' (Oliver 1995; Long 1996; Lyster 1998), 'semantically contingent interaction' (Wells 1985) and 'leading from behind' (Painter 1984; Wells 1995). The notion of semantic responsiveness is discussed further in the discussion below of the role of discourse in second language learning, and explored in later chapters in terms of the notion of 'contingency' in teacher-student interaction.

Learner output

Research into French immersion programs in Canada has found that despite very great amounts of comprehensible input, and a communicatively oriented classroom, students may not develop native-like proficiency in syntax and morphology (Allen, Swain, Harley and Cummins 1990; Swain 1985, 1995a, 1995b). Swain (1985) suggests that what is missing in these classrooms is sufficient learner output, that is, the language that learners produce, and concludes that the limited opportunities that students had in the immersion classes for *extended* output which demanded linguistic accuracy, might be a factor in explaining lower proficiency levels than might have been predicted.

Swain argues that since the ability to decode the language is not the same as discovering and producing the linguistic systems that carry meaning, output encourages learners to process the language more deeply than comprehension alone

[4] The term 'interlanguage' is used with a number of related meanings. Most simply, it refers to the notion of an approximative system (Nemser 1971, in Ellis 1994).

may do: it 'stretches' or 'pushes' their interlanguage, by stimulating learners to focus on form more than they need to when processing another speaker's input. Output can thus be considered "to represent the leading edge of a learner's interlanguage" (Swain 1995b, p. 12), a significant claim clearly related to Vygotsky's notion of learning within the ZPD. Swain (1985) suggests that learners need opportunities to 'stretch' their interlanguage to meet communicative goals, thus arguing, unlike Krashen, that such production is in itself a source of learning, not simply an outcome of what has been learned. The importance of interactions which are comprehensible to the learner is therefore not only because the learner's focus is on meaning, or because a two-way exchange is occurring. More important is the fact that, by being understood by the learner, and matching the learner's ongoing intentions and cognitions, it permits the learner to focus on form. It would seem that negotiating meaning, or what Swain refers to as coming to a communicative consensus, is a necessary first step to grammatical acquisition: because the message is understood, the learner pays attention to form, thus "paving the way" for future exchanges. While one to one conversations provide important opportunities for this, as well as meaningful use by the learner of their current linguistic resources, even more helpful for acquisition are those occasions where communication breaks down and the learner, in response to negative feedback by the interlocutor, is 'pushed' to use alternate means of getting their message across. Since, however, this can occur with grammatically deviant or sociolinguistically inappropriate forms, Swain also argues that the notion of 'negotiating meaning' should not simply imply that the learner has been able to get the message across, but should incorporate the notion of conveying meaning "precisely, coherently and appropriately" (Swain 1985, p. 249).

Three functions of output in second language acquisition are posited (Swain 1995a). First it appears to promote 'noticing', by which Swain refers to the recognition by learners of a 'gap' in their linguistic system: that is, they consciously recognise something which is a linguistic problem for them, a gap between what they wish to say and what they are able to say. (Swain's use of 'noticing' in this way differs slightly from its use by some other researchers. Chaudron (1985) and Ellis (1994) for example, use the term noticing to refer to the learner attending consciously to linguistic features in the *input*.) Second, output offers opportunities for learners to test hypotheses, for example when feedback leads to learners modifying or reformulating their output. Third, output has a metalinguistic dimension, whereby a learner's reflection on their language use helps them to internalise linguistic knowledge. Using the example of dictogloss, a language teaching activity where small groups of students work collaboratively to reconstruct a text which they have heard read aloud, Swain shows how this procedure led students to talk *about*

language in the context of using language, and was successful in getting them to notice the gap between their current language knowledge and what they needed to know. Many of the solutions worked out by the students through this reflective process were remembered a week or two later, leading Swain to conclude that contexts where students reflect on the language they are using appear to be supportive for second language learning. Other similar roles for output have also been posited (Ellis 1994), and it has been suggested to be the mechanism that facilitates the integration of language into the learner's developing system. Thus "situational conditions and tasks that promote interaction ... and which encourage the processes of noticing, comparison and integration will be effective for acquisition (Ellis 1991, p. 202).

There is an additional sense in which learners may benefit from being 'pushed', that is, when there is a need to communicate in more sociolinguistically appropriate ways. While some learners may have achieved a high level of grammatical accuracy they may have in their linguistic repertoire only a restricted range of grammatical constructions and thus are unable to vary what they say according to contextual constraints and requirements. A functional perspective on language suggests that the result of this would be to limit learners' socio-linguistic competence, the degree to which they are able to control the language appropriate to different social contexts and purposes. As pointed out in Chapter 1, this is very relevant to second language learners in school. While learners may be able to produce grammatically 'correct' language, it may not always be appropriate to the situation or may be inadequate to meet the demands of less context-reliant situations. Thus:

> such learners need to experience situations that require more complex output, as, for example, when they are called on to demonstrate mastery of the forms required to communicate in a sociolinguistic appropriate manner with different addressees.
> (Ellis 1994, p 284).

This is an important issue in the context of this study and one which the study directly addresses.

In acknowledging the role of production and arguing for the importance of interactional modifications in promoting L2 acquisition, Pica (1988) and Pica, Holliday, Lewis and Morgenthaler (1989) argue that certain kinds of interactional modifications are more helpful than others for 'stretching' learners. Requests for clarification, for example, are more likely to stretch learners to focus on how they

have said something, whereas straight confirmation checks from the teacher may be less effective because they solve the communication problem for the learner. This issue is taken up in Chapter 7, particularly in relation to teacher 'moves' in the interactional patterns of the classroom.

In emphasising the interplay between the language learner and the possibilities for interaction in the environment, interactive models of acquisition present a more comprehensive view of language acquisition than those which are grounded solely on cognitive and psychological variables. However, the focus has tended to be on specific and clause level features within individual utterances, rather than on the communicative effect of the discourse as a whole. This may reflect both the accuracy-driven view of language underpinning much SLA research, and the fact that discourse-based approaches are less amenable to quantitative analysis. At this point I turn to SLA studies which have been concerned more explicitly with the role of discourse in learning.

The role of discourse

Discourse analysis has been on the SLA agenda for some time. In a seminal paper in 1978, Hatch wrote that "the search for explanation [for second language acquisition] via discourse analysis is one of the more promising areas of research" (Hatch 1978, p. 402). In this paper she builds a case for discourse analysis as a methodology for the study of second language acquisition, suggesting that discourse analysis "gives more revealing, if less formal and elegant, insights into the second language learning *process* " (p. 402). She argues that in talking about the importance of input and the frequency of forms found in that input, we have "overlooked the most important factor of all, the link that explains *how* the child learns". Discourse analysis is one way to approach this:

> it is not enough to look at input and to look at frequency; the important thing is to look at the corpus as a whole and examine the interactions that take place within conversations to see how that interaction, itself, determines frequency of forms and how it shows language functions evolving.
> (Hatch 1978, p. 403)

Drawing on Scollon's work on first language learning (Scollon 1976), Hatch suggests that the importance of discourse in language development is that linear (grammatical and sentence level) structures arise out of the vertical constructions of discourse. Interaction serves to provide learners with opportunities to create these

'vertical constructions', where meaning is built up over several turns. Vertical constructions provide the basis on which the learner is subsequently able to produce a meaning within one turn. Hatch notes that when an adult takes the topic nominated by the child, and asks for clarification, they are also asking for a constituent to fill out the construction, for example:

> Child: hiding
> Adult: hiding? what's hiding?
> Child: balloon
> (Hatch 1978, p. 406)

Thus "one learns how to do conversation, one learns how to interact verbally, and out of this interaction syntactic structures are developed" (Hatch 1978, p. 404). It is through this form of "'apprenticeship in conversation' that children learn both the language system and the cultural ways of making sense of experience that constitute the 'meaning potential' of that system" (Wells 1992). Thus the learner and the partner *together* build a conversation, a process which many of the texts discussed in this study illustrate. In relation to early mother tongue development, Bruner also notes that the structure of language is a by-product of learning to use language in discourse (Bruner 1978). Like some second language researchers (Pica 1988; Pica et al 1989), Wells argues for a particular quality of interaction. This quality he terms a "contingent responsiveness" to the needs of the learner, which Snow (1986) similarly refers to as "semantically contingent speech". Wells argues that semantically contingent responsiveness is as important a feature of teachers' interactions in the classroom in facilitating the learning process of students in school, as it is in first language development.

Among the features of contingently responsive speech Wells (1986) includes the following: experts check that they have understood children correctly; misunderstandings are negotiated, topics initiated by children are sustained; and children are given opportunities to contribute to the conversation. Contingent responsiveness appears to be a feature in the speech of parents whose children are seen as accelerated language learners (Wells 1985), and while the input of parents of fast-learning and slow-learning children does not differ significantly on linguistic features, it does differ in the number of interactional features such as expansions and acknowledgements (Ellis and Wells 1980).

There are interesting parallels in SLA research on the types of interactional modifications believed to be most facilitative of second language learning. In a study

of the second language development of two adolescent Punjabi speakers, Ellis (1994) examines whether and in what way interactions with the teacher contributed to the children's acquisition of English. He suggests that by identifying when 'new' language items appear in the learner's speech and then examining the discoursal content of these features, it is possible to shed light on how taking part in conversations contributes to language learning. This approach, as he points out, depends on a qualitative rather than a quantitative analysis of discourse. An examination of his data from this standpoint suggests a number of facilitating characteristics of the discourse. First it appears that new items were more likely to be produced when the children were allowed to initiate the discourse topic; thus the children were able to establish intersubjectivity with the teacher without having to first understand what the teacher wanted them to talk about. Second, the teacher helped the children to 'stretch' their linguistic resources by providing models of new syntactic structures at the moment when the children needed them; the children could then incorporate these into their own speech, and were thus able to achieve a more complex coding than would have been possible alone. Third, the teacher's responses to the students' contributions frequently encapsulated expansions which supplied the missing parts of students' utterances which students had struggled to produce, or added new semantic information. Ellis concludes that comprehensible input is not simply the result of adjustments made by competent speakers, but is the result of the interactions themselves: both learner and native speaker adjust their speech in the light of feedback which they give each other. Simply noting native speaker adjustments may not therefore provide a full picture of how input is made comprehensible or how language develops. Rather, as functional linguists would argue (for example, Painter 1984, 1985) language is developed as a way of organising and understanding experience as that experience takes place. Out of a conversation, then, certain structures arise, not because, as the input hypothesis suggests, an acquisition device is operating on the input, but because the child wants to communicate about something.

Recent research in SLA has focused on the role of recasts in language acquisition, as part of a broader concern with the role of negative evidence, that is, information about what is not allowable in a language (normally, in the studies to date, defined in terms of grammatical acceptability). Recasts have been defined as "utterances that rephrase a child's utterance by changing one or more sentence components ... while still referring to its central meanings" (Long 1996, p. 434). Recasts are one type of semantically contingent speech (Lyster 1998) that have begun to be examined by a number of researchers (see Morgan, Bonamo and Travis 1995, on parent-child dyads; Oliver 1995, on child Native Speaker-Non Native Speaker

dyads; and Doughty 1994, Doughty and Varela (in press), and Lyster and Ranta (1997), on teacher- student interaction in second language classrooms). Oliver (1995) offers evidence of the facilitative effect on language acquisition of semantically contingent feedback which occurs within discourse. Drawing on first language acquisition research, and the work of Farrar (1990), Oliver defines recasts as utterances that correct the child's syntactic or semantic errors by a caregiver demonstrating the correct sentence after the child has produced an ungrammatical one. Thus it would appear to be referring to a similar phenomenon as Wells and others in their work on contingent speech in mother tongue development. Oliver considers whether learners acquire a second language based purely on positive evidence, (models of the correct form of the target language) or whether negative evidence (data that gives the learner information about what is not allowable) also plays a role, and argues that indirect and implicit feedback, such as recasts, negotiation strategies and forms of repetition, need to be included in considering the role of negative feedback. Recasts are likely to be 'usable', or noticed by the learner, because they are salient and contingent on what the learner has said (Farrar 1990) and likely to lead to 'comparison' between the two forms, because the recast maintains the central meaning of what the learner has said (Long 1996). In this context, (and as suggested by earlier discussion, as Ellis, Swain and others also suggest), the meaning is already clear, and so the learner is more likely to attend to and compare the differences in form between what they have said and the adult response. Oliver's study focuses on the use of negative feedback between child native speaker and non-native speaker, and demonstrates both its existence and its relative frequency in tasks where the focus was on meaning (rather than on form). In 61% of instances of interactions involving NNS errors, NS's responded with negotiations or recasts, and there is evidence that learners used this feedback in subsequent interactions.

There is however also evidence that implicit recasts (where learners are provided with reformulations of erroneous utterance) lead to minimal uptake and do not lead to student-generated forms of repair (Lyster and Ranta 1997). In Lyster and Ranta's study, more than half of the teachers' corrective feedback moves involved recasts, although the majority of these (69%) were followed by topic continuation in which students did not immediately repeat or incorporate the correct form. The researchers conclude that this is because recasts *provide* correct forms to learners, and so students are not required to generate their own repair. They suggest that in classrooms where the teacher is focusing on both content and language, a wider range of feedback strategies is required which explicitly focus on the negotiation of form, rather than simply on the overall meaning and substantive content of student

contributions. These strategies include elicitation (*how do we say that in French*); metalinguistic clues (*we don't say it that way*); clarification requests (*I don't understand*), and repetition of student error as a question (*le girafe?*):

> Unlike the negotiation of meaning, the negotiation of form aims not only at comprehensibility of message but also for accuracy and precision in form, thus involving a more pedagogical and less conversational function of negotiation.
> (Lyster 1998, p. 53)

Such strategies, involving focus on the negotiation of form as well as meaning and content, are used many times by the teachers in this study.

It has been suggested that such modifications occur most often when native speakers signal an explicit need for clarification rather than provide a model utterance as confirmation (Pica 1988; Pica et al 1989), since while implicit recasts do require the learner to acknowledge the response they do not require them to adjust what they have said. Negotiation of form, when realised as a listener signalling a need for clarification, may benefit second language learning in two ways: by providing clues to learners to assist them in modifying and actively confronting errors, and thus revising their hypotheses about the new language; and by inviting student — rather than teacher — generated repair, which provides opportunities for learners to 'proceduralise' knowledge that they have internalised about the language in declarative form (Swain 1995a, 1995b; Lyster and Ranta 1997).

However 'implicit' recasts, those which simply reformulate all or part of the student's utterance with no additional meaning and without drawing the student's attention to the reformulation, have been described as "remnants of audiolingualism that minimise the value of student utterances" (Calve 1992, cited in Lyster 1998, p. 55). Allwright and Bailey (1991) also point out that simple repetition of the correct form by the student may be useless if the student is unable to differentiate between the model and their own utterance, and that time and opportunity needs to be given for self repair. Van Lier (1988, 1996) also argues that teachers should delay correction until the learner has had opportunity to self-repair.

A recent study (Lyster 1998) attempts to explore further how teachers use recasts naturalistically in meaning-oriented classrooms, where the focus is primarily on content rather than on language per se. This study suggests that in the classrooms examined, the corrective function of recasts (ie. in relation to grammatical form)

appeared to be less salient than the discourse functions they served (ie. in relation to the substantive subject content of the students' utterances). In addition, the intent of the recast from the students' perspective tended to be ambiguous, since teachers often used noncorrective repetition, that is, they repeated well-formed as well as corrective utterances. It can be questioned how far learners (particularly young learners) are then able to distinguish one context from the other, and thus recognise those times when their utterances need repair. Such ambiguity makes it difficult for them both to test hypotheses about the target language, and to detect mismatches between input and output (Lyster 1998).

Several studies support the role of negative evidence (for example, Pica et al 1989; Pica 1988; Lightbown and Spada 1990; Carroll and Swain 1993), although as Lyster points out, none of these support the implicit use of recasts without some explicit attention being drawn to them by the teacher/native-speaker interactant. Some evidence exists however for the uptake by students of jointly constructed discourse containing both students' contributions and teachers' recasts of these in more register appropriate ways (Gibbons 1998). Journal writing by students in science lessons contained instances of teachers' recasts which had occurred during a series of interactions between teacher and students, when students had recounted the results of experiments to others who had not taken part in them. In this classroom too, however, there were frequent explicit comments by the teacher foregrounding the form of language (in this case the scientific register), for example, students' attention was often drawn to the fact that they were "learning to talk like scientists". A recent study by Doughty and Varela (forthcoming, cited in Lyster 1998) also demonstrates the benefits of recasting when preceded by explicit signals with an attentional focus.

The significance of recasts for second language learning is therefore far from clear and as Lyster points out, presents a dilemma for teachers whose mandate is to teach both language and content, "namely, how to reinforce the substantive content of student messages while giving [students] clear messages about language form" (Lyster 1998, p. 71). However it appears likely that the usefulness of recasts is increased when they are accompanied by some explicit signalling to the learner, so that they are noticed. This signalling includes metalinguistic talk relating to the form of the recast item, and signs of non-comprehension by the listener which require the learner to take an active part in reformulating the utterance. Both these issues are taken up in this study in the analysis of teacher-student talk in Chapters 5, 6, and 7.

This section has examined research which has focused on how input, output, and learner-teacher discourse might each have a role in second language acquisition. The following section discusses insights from classroom-based research and suggests how aspects of the classroom itself might impact on learning.

Pedagogically Focused Research

Minority learners in mainstream classrooms

There have been relatively few studies on how classroom organisation impacts on second language learning, or looks at language learning in a multilingual 'mainstream' (that is, non ESL-specialist) context. These issues are specifically addressed in a study by Wong-Fillmore (1985), where she examines possible reasons why some minority children learned a great deal more English in their first year of school than others. Although she points out that the results are not conclusive, the study is discussed here in some detail both because the data were drawn from authentic classrooms, and because the issues it raises are particularly pertinent to this study.

Wong-Fillmore suggests that two sets of characteristics appear to distinguish classes that worked for language learning from those that did not. The first set relates to the way the classes were organised, that is, the participant structures of the class, and the second to the way language was used during instructional activities. Wong-Fillmore draws a distinction in her study between 'teacher-directed' or 'teacher-centred' classes, and 'open' or 'student-centred' classes. The first type was highly controlled by the teacher, and included a relatively greater number of whole class or large group instructional events. The second was 'coordinated' rather than 'directed' by the teacher, and included a relatively greater number of individual or small group cooperative group learning activities. Wong-Fillmore concludes that the classrooms which were least successful for language learning were those which were more 'open' in structure, while the most successful were those which made the greatest use of teacher-directed activities.

Wong-Fillmore advances a number of hypotheses to explain the relative lack of success of the more open classrooms in her study. First, it appears that how much practice students actually get with English is dependent on individual students, whether or not, for example, they have well developed social skills. It also depends on who is in the class, whether, for example, there are sufficient numbers of English speakers to support those with less English. In addition, much of the interaction in open classes was between teacher and individual student, and so the amount of exposure to English could vary considerably from student to student. Wong-

Fillmore also suggests that where most of the students are not native English speakers, they are exposed to non-standard models of language as input (Selinker, Swain and Dumas, 1975) and may as a consequence develop permanent interlanguage features in their speech. She concludes that in open classrooms, "the major source of second language input comes from other language learners, a situation which is hardly conducive to successful language learning" (Wong-Fillmore 1985, p. 26). This suggestion, however, is not substantiated by other research which suggests that the grammaticality of students' production is no different whether speaking in group situations or in a teacher-fronted situations, (Pica and Doughty 1985a), although Porter (1986) does suggest that an overuse of small group communicative-type activities may not provide sufficient new sociolinguistic input to students.

In discussing the characteristics of those classrooms which appeared to be successful settings for language learning, Wong-Fillmore draws attention to the fact that the main structural organisation represented a balance between teacher-directed and individual activities, although she does not suggest what constitutes a 'balance', or how this balance was achieved, an aspect of classroom planning which is addressed in this study. The activities themselves tended to have different organisational characteristics from those in the more open classes, suggesting that the structure of the activities affected how well the language used in them could be used as input. Three characteristics of lessons appeared to be significant for language learning. First, they were formal, timetabled lessons with clear boundaries between 'subjects' or between individual and whole class work. These boundaries were not only linguistic, but were marked in other ways such as a change in seating pattern or the teacher's voice quality or body language. It is likely that such boundary markers served to frame the lesson or activity, thus indicating to the children when they should pay attention and what they should be listening for. Children therefore knew what to expect, what to do and where to go, even if they understood little English, and little time was then wasted in organising the procedural aspect of teaching activities. The second structural characteristic of successful classes was the consistency of the overall lesson formats. Although Wong-Fillmore does not claim this to be creative teaching or even an example of best practice, she comments that this consistency resulted in students becoming familiar with teaching routines and thus being better able to play the roles expected of them as participants. They were able to follow the lesson without having to work out anew what was happening: they were "ahead of the game in figuring out what they are supposed to be learning each day" (Wong-Fillmore 1985, p. 29). Thus although the content may have been new, the regularity of the lesson routines, the routinised,

consistent language used by the teacher, and the familiarity of the activities, meant that the format in which the content was presented was a familiar one. An important part of these familiar routines was the teachers' use of instructions and signals to guide the learner, such as telling students what they were going to do (*open your math books, now we are going to review this page*) and locating new learning in students prior experiences (*you did have math on Friday but we didn't use this book*)[5]. Wong-Fillmore points out that such signalling devices provide an orientation for students, telling them where they are and what they will do next. The third structural characteristic of successful classes is related to turn allocation. Teachers tended to use a variety of procedures: at times students bid for turns, or they might be asked to recite in chorus, or they may be called on by teachers, but procedures for participation were always clear. In contrast, procedures in less successful classes were often unclear, with more aggressive students gaining more 'turns' and hence a greater share of the feedback. Quieter students on the other hand got fewer turns to participate and consequently less feedback from the teacher.

In the same study, Wong-Fillmore also considers the characteristics of teacher talk that worked well as input. As many of the children had only been learning English for two years or less, it was difficult for teachers to teach anything that could not be easily demonstrated. How they communicated what was to be learned in the lessons not only affected how effectively curriculum content was learned, but also whether the language used "worked as language learning". The teacher-talk in successful classes shared a number of features. First, there was an emphasis on communicating meaning. Since English was the *medium* of education (unlike the situation where English is the *subject* of the lesson, such as in instructional ESL and EFL classes) ideas and concepts were often quite complex, and yet in the successful classes, the lesson was at an appropriate conceptual level for the grade. Often the teacher used demonstration as a way of teaching concepts, for example by writing and working out maths problems while she was talking, and relating the words to known maths concepts. Wong-Fillmore illustrates how the teacher demonstrated each idea she was trying to communicate to the students, relating the concepts she was discussing to the procedures that the students were to use, for example by demonstrating the process of division in mathematics on the board as she was talking, and putting new information in the context of work that the students had already done. Thus prior knowledge and experience provided the contexts for making sense of new material and possibly unknown language. Wong-Fillmore concludes that the presentation of the material in a variety of ways, such as talk,

[5] The teacher is thus using both anaphoric and cataphoric references to locate the here-and-now learning.

board work and demonstration "added up to a message redundancy that gave the students multiple access to the materials that were taught in it" (Wong-Fillmore 1985, p. 38). This notion of multiple access is explored further in the current study, particularly in relation to the provision of comprehensible input.

A further feature of the teacher-talk in all classes was its grammaticality and lack of 'foreigner-talk' forms. Of particular significance in the teacher-talk in the successful classrooms however was the fact that it was not only grammatical but registrally appropriate. Such talk is defined by Wong-Fillmore as "more precise, more expository, and more highly propositionalised than ordinary talk", which also defines the type of language that students need for school. Wong-Fillmore points out that it is therefore essential for students to be exposed to this kind of language by their teachers. In addition, teacher talk included the repeated use of patterns and routines that have the appearance of substitution drills, although as Wong-Fillmore points out, here they are used for the teaching of content, not merely for the rehearsal of language structures:

> What does an inventor do? They make things. New things. An inventor made the first TV. An inventor made the telephone, the first telephone. An inventor made the first electric light. An inventor makes things. He makes up new things for the first time.
> (Wong-Fillmore 1985, p. 39)

Similar instances occur in the data in the current study (see for example Chapters 6 and 7). The repetition of key patterns and the message redundancy in Wong-Fillmore's example offer the students more than one chance to understand what is being said, and to notice where and how forms can be substituted. The teacher's use of repetition gives students several opportunities to hear what is almost the same sentence, and in this way, students can work out some of the substitution rules of English. Paraphrases were also common; again giving students several opportunities to understand a message and to learn alternative forms. (It is worth noting here that in a review of the effects of input modification on comprehension, Parker and Chaudron (1987) also note the facilitative effect of such factors, suggesting that simplified input may be less effective in facilitating comprehension than elaborations which contribute to redundancy, such as repetition, paraphrase, or the use of synonyms, or which clarify the thematic structure of the discourse.) In addition, teachers frequently repeated students' one-word answers to questions and expanded them into their full forms, an example of one type of what was earlier

described as a 'recast'. The current study explores further the use of questions and teacher initiation moves.

The final characteristic of teacher-talk in successful lessons is what Wong-Fillmore describes as "richness of language". While the language tended to be simple, teachers exemplified a variety of forms, functions and uses of language in their own talk: it was "in no way the stripped-down, unnaturally plain language featured in many ESL courses". Wong-Fillmore concludes that the teachers "were effective communicators ... because all of them were concerned with communication".

Although she herself does not refer to the notion of explicitness, it is clear that the successful classrooms in Wong-Fillmore's study exhibited a high level of explicitness about both the content and the procedures of the lesson. Delpit (1988) also makes it clear that this was a feature valued by the black school students of her study. Her work is discussed in more detail in Part 3 of this chapter, but here it is worth noting the similarities in this respect between the pedagogy which she favours, and the more 'closed' classrooms to which Wong-Fillmore refers.

With the concern for communication in the language classrooms, there has been a focus on the nature of the questions that teachers ask. Long and Sato (1983) found that teachers used significantly fewer referential questions (where the teacher is asking for information which she does not already know) than display questions, (where the information is already known by the teacher), a finding which is supported by Pica and Long (1986). In a survey of research on teacher-student interaction, Chaudron (1988) suggests that questions alone may not promote learner output, and that while modifications of questions may help the learner, multiple questions do not, on their own, serve to make language comprehensible. Chaudron concludes that questions that negotiate comprehension and sharing of information are the most potentially useful to the learner. This is taken up in subsequent chapters of this study, and discussed in relation to the teacher's 'feedback moves' in Chapter 7.

It also appears that the ratio of display to referential questions increases in contexts where there are non-native speakers. Early (1985) found that while the ratio used by teachers with ESL social studies students was almost 6 to 1, it was only 1.5 to 1 for native speaker students, thus suggesting that display and referential questions are differentially distributed across ESL and non ESL students. A study by Jane Torr (1993) found similar results in primary classrooms. Her study involved two teachers, one with children from English-speaking backgrounds (ESB) and the other

with children from non-English speaking backgrounds (NESB), many of the latter group however being rated as fluent English speakers by their teacher. Torr suggests that the nature of the teacher talk led to the NESB group playing a different role in the construction of the discourse compared with their English-speaking counterparts. The NESB teacher spoke more frequently, contributing more to the construction of the discourse, and asked fewer questions, with those questions requiring mainly display responses, (such as the naming of people, things and processes). In the NESB classroom the teacher tended to be coded in the grammar as doing the 'thinking', 'knowing' and 'hoping'. By comparison, many of the questions asked by the ESB teacher required explanations of how or why something occurs, and it was the children who were coded in the grammar as 'knowers' and 'thinkers'. Relative to the ESB class, the NESB children spoke less frequently, (thus limiting opportunities for interaction with the teacher), asked fewer questions and made fewer unsolicited observations. Consequently the classroom offered them fewer semantic options than those available to the ESB students. Torr concludes that the two environments were "significant in terms of the children's potential to gain access to society's resources" (Torr 1993, p. 52).

Group talk and group tasks in the classroom

It has been suggested that in traditional, teacher-fronted classrooms, students who are less proficient in English take part in less communication with their peers and their teacher, and that this communication is also at a lower linguistic and cognitive level (Long, 1980). Traditional participation structures often result in students producing only a quarter to a third of the total utterances (see for example Sinclair and Coulthard 1975; Mehan 1979; Long and Porter 1985; Edwards and Mercer 1987; Chaudron 1988). The triadic structure of typical classroom discourse is examined more fully in Chapter 4. The critical point here, however, is that the output hypothesis would suggest that learners require more opportunities for language use than this type of interactional structure provides.

Group work offers students many more opportunities to hear more complex language and in increased amounts (Long and Porter 1985; Pica 1987) and may result in a wider range of rhetorical functions being used (Long, Adams, McLean and Castanos 1976). It is now generally accepted that practice in speaking in communicative exchanges in the classrooms is necessary for the development of communicative competence and greatly increases the opportunities students have to use new language (Porter 1986). Group work has important pedagogical and psychological perspectives: students in groups tend to take more turns, produce

more language, and have more language directed towards them. It increases language practice opportunities, improves the quality of student talk, promotes a positive affective environment and increases learners' motivation to learn (Long and Porter 1985), and is likely to lead to more interactional modifications than teacher-fronted tasks (Pica and Doughty 1985a). It has also been suggested that small group work offers major benefits to students relating to three areas of theoretical importance for language learning: input, interaction, and the contextualisation of knowledge. The process of asking questions, exchanging information and problem solving provides a natural context for redundancy to occur. Redundancy includes the repetition of words, the rephrasing of ideas, the restatement of problems and the refining of meanings. This redundancy, when contextualised within the curriculum and driven by the communicative requirements of the interactants, supports comprehension. In addition, the need to get information or clarify meaning also increases the need for learners to ask questions which genuinely seek new information, (in contrast to teacher known-answer or 'display' questions), and thus further input and practice in genuine communication is provided (McGroarty 1993).

There may be an additional reason why a heavily teacher-controlled classroom is insufficient for promoting language learning. The social relationships between participants appears to be a factor in the extent to which interactional modifications take place, and this suggests that the social relationship between participants underpins the need for mutual understanding and the opportunity to modify interactions. It appears important that participants see themselves as having equivalent status as conversational partners if interactional modifications are to occur (Pica 1987). Pica argues that these circumstances are more likely to occur in the process of a two-way information flow, when both participants have information which the other needs to share; each participant has both a right to request and an obligation to share. However in a classroom which is predominantly teacher-controlled, and therefore where there is an unequal distribution of participation rights, these conditions are less likely to be met. When the talk is controlled by the teacher, through the initiation, response, follow-up pattern described earlier, it is usually unnecessary for the student to restructure their interaction, since the discourse tends to be aimed at a one-way display from student to teacher, rather than a two-way flow of information, and thus there are minimal opportunities for the restructuring of interaction claimed to be necessary for second language learning. Teachers normally know beforehand the kind of thing they want students to say and do: mutual comprehension does not have to be striven for but tends to be built into the discourse. Many classroom activities are actually set up in such a way that students can opt out of interaction:

> when faced with ambiguous target or interlanguage material on a particular topic, classroom participants may be willing to suspend comprehension completely, or settle for less than total understanding, rather than interrupt the flow of classroom discourse to seek clarification.
> (Pica 1987, p. 12)

It also appears that communication breakdowns are more frequent between non-native speakers than between native and non-native speakers, and so it has been suggested that interactions between non-native speakers result in more practice in negotiating meaning, since there is no one to intervene and resolve the communication breakdown for them (Varonis and Gass 1982, 1985). Thus genuine communication between nonnative speakers is likely to lead to a greater degree of involvement in the negotiation of meaning than does talk with a native-speaker. An implication for the classroom, where typically the teacher is a native speaker, would appear to be that the teacher should at times avoid taking responsibility for the immediate resolution of communication breakdown, and structure the discourse in such a way that the student shares this responsibility. This issue, in terms of the notion of jointly constructed discourse, is one which this study explores.

Peer group talk, then, would seem to be facilitative of language learning on two counts: it has the potential to offer many more and varied opportunities for language use and target language practice, and it is more likely to produce the kind of social relations to which Pica refers. Although support for the use of group work appears be well-founded, one of the ongoing concerns of teachers has been that in group work students will be exposed to inaccurate models of English (Selinker et al 1975). Studies have shown, however, that group work does not significantly compromise grammatical accuracy, and there is little difference in this aspect between teacher-fronted and group talk in the classroom. While interlanguage talk may be less grammatical than teacher talk, a study by Porter (1986) found that learners corrected each other's errors wrongly only 0.3 per cent of the time. Long and Porter (1985) likewise suggest that group work does not compromise accuracy significantly.

The nature of the tasks in which learners are engaged appears significant in how successful group work is in providing a language learning context. A number of studies have concluded that tasks which involve students in exchanging information (two-way tasks) lead to a higher frequency of interactional modifications and hence

are more likely to promote negotiation of meaning, than tasks which require only a one-way giving of information (Long 1980, 1989; Pica and Doughty 1985b). In a comparison of teacher-directed and student-student talk in two tasks, a decision-making discussion and an information-exchange task, Pica (1987) likewise found that teacher-directed talk generated a relatively small amount of interactional modifications in both tasks, whereas in group participation there was a four-fold increase in interactional modifications in the information-exchange task. However, the decision-making task produced only slightly more modifications than the teacher-directed activities, leading Pica to suggest that a critical factor in the information-exchange task was the fact that participants were exchanging "unique bits of information":

> ... the results indicated that modified social interaction was not an inevitable outcome of students' working together but instead was conditioned by the nature of the classroom activities in which they participated.
> (Pica 1987, p. 15)

This suggests that students are more likely to restructure their interactions, and work towards mutual comprehension, if the task requires, rather than simply invites, them to do so. Pica concludes that talk must be necessary and integral to the task, not simply an accompaniment, and should emphasise collaboration and equality of responsibility. McGroarty (1993) likewise suggests that individual accountability should be built into group activities, so that the resulting interaction is more likely to lead to genuine collaboration and hence negotiation among participants.

The output hypothesis would suggest that such tasks would be facilitative of language acquisition on the grounds that they create contexts where students are actively involved in producing language. Communication between interactants in the context of two-way information gap tasks involves overcoming a differential, some imbalance of information between the two parties. As the discussion of the mode continuum in Chapter 3 will suggest, language development and the school curriculum itself can be viewed more broadly as the ability to communicate across wider and wider information gaps or information distances. It would therefore appear that not only are two-way tasks facilitative of language development, they also predict, for school-aged children, the kind of language demands they will face as they move through school.

In one respect, student-student talk is likely to be inferior however. Non-native speakers tend not to provide each other with sociolinguistically appropriate input and thus may be unable to develop sociolinguistic competence from each other (Porter 1986). This is particularly significant in relation to the current study, where the focus of the teaching was on the development of sociolinguistic competence, specifically the development of a school register. It suggests that in this respect students will be dependent on other sources, such as the teacher, to provide access to the target language (in this study, a register unknown to most). For this aspect of learning some teacher-centred teaching appears to be appropriate. This is addressed in Chapter 6.

In summary, research studies present some tension between approaches that favour the teacher-centred or 'closed' classroom of the kind described in Wong-Fillmore's study, and those which argue for the value of small group work. This issue is one which later chapters of this study take up.

Content-based language teaching

School-aged ESL learners are faced with the need to learn curriculum content through the medium of their second language, and teachers with the job of providing language teaching which is not at the cost of the development of curriculum knowledge. This section examines factors relating specifically to content-based language teaching in a school setting.

Language teaching methodologies have long accepted the notion that language teaching is more effective when learners are presented with meaningful language in context, and the integration of language and content teaching is now generally accepted as enabling of second language learning (Short 1993). There have been a number of reasons put forward to support this view in relation to school-aged second language learners. For children, cognitive development and language development go hand in hand; language is learned most effectively in meaningful, purposeful social and academic contexts; content provides a cognitive basis for language learning in that real meanings are being made while specific language functions and structures are being used; and the learning of subject specific registers are closely related to the ultimate mastery of specific content or to academic development in general (Snow, Met and Genesee 1989). Subject-matter classes can be viewed as language classes on the grounds that they are likely to provide plenty of comprehensible input (Krashen 1985). Since language is being heard in the context of an academic activity that provides a conceptual structure for language

redundancy, students are likely to remember more of what they hear, and since the focus is on meaning, correction is used in the service of understanding (McGroarty 1993). Likewise it has also been suggested that students learn language more effectively when their attention is focused on learning other things: interesting content provides a motivation to learn, and language becomes the means to this end, rather than an end in itself (Genesee 1987). In a model where linguistic structures are grouped around but subordinated to a topic or theme, the content can be exploited and maximised for the teaching of the 'skill areas', and this has the potential to tie together the various skill areas via the contextual theme. Since the topic is already given, teachers have no problem about the 'content' of the language lesson, something that may be a problem in a 'language' class where teaching may be done in the absence of a ready-made context. In content teaching, students are also assured of a focus on meaning, rather than form; communication takes place because the students are engaged in "real, not just realistic", topics and activities (Brinton, Snow and Wesche 1989).

However, although there is considerable support for content-based language teaching, there are still issues surrounding exactly what role 'content' should play in the language acquisition process (Brinton et al 1989) and how the integration between the two should be accomplished (Met 1994; Swain 1996). Often the relationship between 'content' and 'language' is not articulated, with language learning and content learning considered separately, an approach which is inadequate for students who are learning through the medium of a language in which they are not yet proficient (Mohan 1986; Met 1994). Mainstream classes into which minority students are placed without specific support or an 'ESL-aware' teacher are also likely to produce inappropriate contexts for language learning (Harklau 1994). An added consideration is also that programs need to be appropriately cognitively demanding for the chronological age and developmental level of the students (Met 1994; Cummins 1996).

A study by Saville-Troike (1984) highlights some of the problems associated with separating ESL teaching from content teaching, but also has implications more generally for ESL content teaching. In an attempt to answer the question of what "really matters" in second language learning in relation to academic achievement, Saville-Troike focuses on the range of achievement of nineteen children learning in English as a second language, who were in mainstream classes for most of the day, but were withdrawn for ESL instruction. Among Saville-Troike's findings is the fact that the language focused on in structured ESL lessons was rarely carried over into other classroom contexts. Even more significantly, accuracy in English morphology

and syntax in spoken language did not appear to make any difference in academic achievement, whereas the number of different vocabulary items that children used was significantly correlated with reading achievement. Contrary to what might be expected, Saville-Troike also found that the ability to interact socially with other children, and the degree to which this occurred, did not correlate with faster learning or with later academic achievement.

Saville-Troike also notes that children with little English appeared not to cope either with whole-class teacher-fronted participant structures, or with individual independent tasks where they were expected to proceed without additional interaction with peers or other adults. The relationship between these participant structures is one which the current study addresses. Saville-Troike also notes that some children's facility in answering the teachers' questions (often requiring minimal language use) misled teachers into thinking that children were learning more English than was in fact the case, a situation which was noted in Chapter 1. Ironically it was only during less formal interactions, when teachers were requesting genuine information, such as whether a student was absent, that students' communicative range increased to include more functional categories which went beyond memorised patterns and which, in addition, required them to struggle to make their meaning clear. This last point not only calls to mind the output hypothesis and Swain's emphasis on the need for 'stretched language', it also has clear implications for the nature of teacher questions.

Saville-Troike presents a number of generalisations of relevance for second language teaching. Among these she highlights vocabulary knowledge as the most important aspect of English for academic purposes, and suggests that vocabulary taught should therefore be related as closely as possible to students' learning needs in their subject classes. She concludes that emphasis on interpersonal communication does not of itself lead to academic achievement and may even inhibit it, and warns against the interpretation of 'communication' to apply only to social interaction, arguing that a broader definition to include a focus on students' "academic competence" is necessary if we are to "fulfil our accountability for students who must learn how to learn through the medium of English" (Saville Troike 1984, p. 217). This focus on academic competence, and how it can be supported by classroom interactions, is the subject of this thesis.

Content-teaching within the 'immersion' model used in bilingual Canadian schools involves English-speaking students being taught curriculum content through the medium of French, and here too the results are not straightforward. Although these

programs have been successful in developing students' knowledge of curriculum content as well as a high level of functional skills in the second language (Genesee 1987), students have not developed native-like competency in some aspects of grammar and syntax, and their language use tends to be sociolinguistically restricted (Harley and King 1989; Swain and Lapkin 1990). Swain (1996) suggests that in the integration of language and content teaching, sufficient attention is not always paid to students' target language use, and that the input students receive from their teachers in immersion classes may not be as rich linguistically as might be expected. Her observations lead her to conclude that the input to which students were exposed was restricted in a number of ways. Although grammar was taught, it was often isolated from meaningful contexts. Apart from context-specific meaning, there was little focus on vocabulary teaching. Extended discourse was rare among students. Their talk (mainly in response to teachers' questions) was rarely sustained, that is, longer than a clause, with only 14% of student turns in teacher-fronted talk being utterances of this length, and as Swain points out, second language theory suggests that students need more opportunities than this for sustained language use. Finally, there was little or inconsistent correction of linguistic errors.

Thus content teaching, while providing a *potential* context for language learning, may not necessarily be realised fully by teachers for this potential. Research by Snow et al (1989) also leads them to claim that "it is unlikely that desired levels of second or foreign language proficiency will emerge simply from the teaching of content through a second or foreign language" (p. 204).

Much less successful than the Canadian bilingual programs have been immersion education for language minority children taught through the medium of their second language, a finding which some have argued is the result of inadequate support for minority students' mother tongues (Cummins and Swain 1986; Cummins 1988; 1996). As discussed in Chapter 1, Cummins (1981, 1994) also argues that very different time frames are required for second language learners to reach peer-appropriate levels in more academically related English, compared to general conversational skills. A distinction between conversational and academically-related language was first made in relation to the achievements of migrant children by Skutnabb-Kangas and Toukamaa (1976) in a description of the academic performance of Finnish immigrant children living in Sweden. The Finnish children had either been born in Sweden but spoke Finnish at home, or had immigrated at pre-school age. Skutnabb-Kangas notes that while many of these children had surface fluency in Swedish, and in everyday situations could converse in age-

appropriate ways in both their first and second languages, their skills in more academically-related language, and particularly in literacy, were much below age-appropriate levels in both languages. Later research has replicated this finding (Collier 1987, 1989; Cummins 1981, 1994; McKay et al 1997) and suggests that it cannot be assumed that children entering the first years of school speaking English as a second language will simply 'pick up' sufficient English for curriculum learning. Moreover, the research points to the fact that the ability to control everyday conversational English, does not necessarily indicate the same ability to control the language of the school curriculum. This issue is central to the study.

In addition, ESL students have not only to learn the second language, but, like the French immersion students, must also learn the subject content of the curriculum as well. In other words, the importance of curriculum content goes beyond simply providing a vehicle for language learning. As Mohan comments, "it is all very well to use the math class as a resource for learning English, but the students' interests in gaining an education in mathematics cannot be neglected" (Mohan 1986, p. 10). Also arguing for an equal importance to be placed on language teaching, Mohan continues, "unlike the deficiencies in other subjects, a deficiency in the language of instruction is a fundamental obstacle to education in all subjects".

Cummins (1994) suggests that content-based language instruction is very appropriate for ESL students, since it can address both their learning and language development needs. However, like Mohan, he argues that such instruction must involve the integration of language teaching with academic content, and simultaneously promote language, cognition and content mastery. Moreover, as argued in Chapter 1 of this study, the modifications to a mainstream program which this requires "do *not* entail a dilution in the conceptual and academic content of the instruction, but the adoption of strategies that take account of students' background and that ensure comprehension of content" (Cummins 1994, p. 42), a point supported by others (Gibbons 1991; Harklau 1995; McKay et al 1997). Strategies as to how this might be achieved include the use of the whole curriculum as a resource for language teaching in the context of a functional approach to language (Gibbons 1991); and the use of visual information structures such as diagrams, graphs and timeliness in making new information comprehensible (Mohan 1986; Early 1990). Arguing for a greater role for vocabulary development in supporting students' academic development, Zimmerman (1997) shows how more interactive approaches to vocabulary teaching contributes to students' knowledge of the multifaceted nature of words and to gains in their vocabulary knowledge. Strategies involved paying greater attention to the role of spoken and oral context in

developing word meaning, an increase in opportunities for repeated encounters of target words in authentic texts, and to thematically related and content-based discussions.

Looking more broadly beyond the level of individual classroom strategies, a number of researchers argue for the significance of the social context and interaction for minority students' learning of both content and language (Edelsky, Altwerger, and Flores 1991; Faltis and Hudelson 1994). Thus "the crux of learning occurs through social interaction in which content is being discussed and negotiated" (Faltis and Hudelson 1994, p. 458). This perspective is foregrounded by the current study. Such a perspective suggests a major shift away from cognitive ideas about second language acquisition towards a notion of language development as contextually situated in activities "that must have one or more knowledgeable members who interact with learners in ways that invite them to 'join the club'". This socially based perspective "more adequately depicts what happens in classrooms that invite students who are acquiring English to generate as well as gain knowledge and discourse from peers and the teacher" (Faltis and Hudelson 1994, p. 458).

It appears from this discussion that while many researchers would argue at a theoretical level for the potential value of the content classroom for language learning, and while strategies exist to make individual lessons more comprehensible, there are complex issues embedded in how such programs should be conceptualised, and how they can then be operationalised.

Addressing these issues, and taking into account language as a medium of learning, and the role of context in communication, Mohan (1986) describes a planned integrative approach which relates language learning and content. This teaching model is developed around a 'knowledge framework' for the sequencing and development of structures of knowledge across the curriculum, and is related to sequencing principles for discourse. The knowledge framework is sequenced from practical to theoretical content, that is, from specific practical activity, to theory which may require students to classify, define principles and evaluate. The discourse framework, in parallel, is sequenced from 'implicit' to 'explicit' discourse: that is, from the practical discourse of 'here and now' action situations, to theoretical academic discourse, in which theoretical knowledge is made explicit, and (relatively permanent) information is conveyed by language alone. These frameworks are underpinned by a sequencing principle for learning itself, from experiential to expository learning.

Talk which occurs in the immediate environment of the learner is however a starting point for the development of 'theoretical discourse' which is not dependent on this immediate situational context:

> A major pedagogical principle for both L1 and L2 teaching is that language skills in context-reduced situations can be most successfully developed on the basis of initial instruction which maximises the degree of context-embeddedness ie. clues to meaning.
> (Cummins 1983, p. 125)

The importance of the 'here-and-now' principle for early language learning is one which has been addressed in both first and second language learning environments (Halliday 1975; Painter 1984, 1985; Krashen 1985; Wells 1985, 1986). Second language development in school will presumably also be facilitated through a similar orientation by the teacher (Dulay et al 1982; Krashen 1985). But while context-embeddedness is an enabling factor of early learning, learners must also learn to control more explicit academic discourse:

> While context-dependent discourse is important for the early stages of language learning, competence on processing relatively context-independent theoretical discourse is necessary for academic achievement and is a major aim of schooling.
> (Mohan 1986, p. 101)

The need for learners to handle this increasingly less context-dependent language has been a recurrent theme in several fields of educational research, not all primarily related to the SLA field. While the notion of 'decontextualised' or 'explicit' discourse is addressed more linguistically in Chapter 3, it is worth noting here, in the context of Mohan's work, the breadth of the research which has addressed it. Halliday (1975), for example, illustrates how a major aspect of language development is the learner's increasing ability to become less reliant on situational contexts, and to interpret discourse and express ideas and experience through language alone. Moffett (1968) points out that a major business of formal education, where typically expository learning is closely tied to written texts and teachers, is to "render experience into words". Cummins argues that while context-dependent discourse is important in the early stages of learning, competence in processing and producing less context-dependent discourse is essential for academic success in schools (Cummins 1994, 1996).

One way to provide for gradual development towards theoretical discourse is to arrange teaching from practical to theoretical, with teachers building on the transition between the experiential and the expository, for example following experiments and simulations with discussions and reports which reflect on the experience (Mohan 1986). The significance of this for language learning is that "it is a transition from discourse interwoven with action and observation, to discourse where the message is expressed by words alone" (Mohan 1986, p. 104). Mohan describes this as the "expanding environments design": learners understand increasingly more distant environments, and develop the ability to handle increasingly less context-dependent discourse, so that ultimately unfamiliar content can be learned through language alone. A critical issue within such a model is the management of this transition from experiential to expository learning, which teachers must achieve while taking into account both the development of curriculum understanding and the development of discourse. Mohan notes that there is "little if any research that addresses this problem directly" (Mohan 1986, p. 115). This issue is central to the current study, and one which it directly addresses in Chapter 5.

PART 3: APPROACHES TO MINORITY EDUCATION

Introduction

This section considers the kind of classroom practices and interpersonal relationships that will lead to bilingual students not only learning the second language successfully, and using it to construct other kinds of curriculum knowledge, but doing so without compromise to cultural and personal identity, a classroom "where students are not only educated to be critical thinkers, but also to view the world as a place where their actions might make a difference" (McLaren 1994, p. 170).

For ESL students in Australia the classroom is simultaneously a site for the learning of a second language; a place where the learning of other curriculum knowledge takes place, (usually through the medium of the second language); and a context for the playing out of power relations, which will position learners in certain ways. These dimensions are not value-neutral. Particular views of the nature of language, language learning and literacy, and the social purposes for these, will influence how a second language is taught and assessed. Particular epistemologies, what kinds of knowledge are privileged, and how it is acquired, are reflected in the content and

teaching processes of the curriculum. And the kinds of interpersonal relationships that are created between students, and between teacher and students, impact on how far students' identities and life experiences are negated or affirmed, and how far their school experiences, in Cummins terms, "construct" or "constrict" possibilities for a more just society.

Before turning to these issues, this section briefly considers the context in which minority education takes place in Australia. It is outside the scope of this study to discuss the historical and political issues around multicultural education in Australia in depth. The survey which follows is intended simply to locate the current study within its broader social and political context; but it does not attempt to address in detail the complexity of the political and policy agendas which have impacted on multicultural and second language education, and on the professional agendas of teachers.

Lo Bianco (1988) describes multicultural education in Australia as "a generalised concept containing both elements of description of society, and normative elements which prescribe that, as a consequence of our demographic pluralism, matching policies are either necessary or desirable" (Lo Bianco 1988, p. 25). He traces three phases in the way multicultural education since the 1970's has been applied to education in Australia, describing these as the discourse of disadvantage, the discourse of incipient multiculturalism and the discourse of 'hard-nosed' multiculturalism. Overall there has been an increasingly utilitarian attitude to multicultural education. This has also been reflected in attitudes to multilingualism which is increasingly considered in terms of economic and trade considerations, attitudes which could lead to a rejection of less 'useful' languages (Clyne, 1991).

The discourse of disadvantage linked ethnicity with class, class consciousness and demands for equality, and characterised the early 1970's. This era saw programs of intervention specifically aimed at particular groups for equity reasons, and the burgeoning of English as a Second Language programs aimed at children and adults. These were aimed at providing access to the mainstream curriculum and towards participation in the broader society.

The discourse of incipient multiculturalism evolved out of this, proposing cultural questions as explanations for minority underachievement. Programs were aimed at intercultural tolerance of culture and language, and the fostering of self esteem for minority groups, including the teaching of 'community' languages. They included the teaching of ethnic heritage, customs and language and were aimed to develop

minority students' personal and cultural identification. They were also targeted not simply at ethnic communities but at the whole of society, on the assumption that this would lead to tolerance, reduced prejudice, harmony and social cohesion. One positive achievement of this time was the official support given to first language maintenance in the National Languages Policy (1987), but many 'multicultural' programs in schools were of the 'spaghetti and polka' variety in their approach to cultural and linguistic diversity. Such programs celebrated aspects of their students' 'cultures' on 'multicultural' days, often rarefying what was perceived as the exotic or quaint elements of cultural diversity, but were often little concerned with educational equity or in a critique of the nature of the curriculum, and tended to reinforce cultural stereotyping.

These programs have been strongly criticised on the grounds that they divert attention away from the key dilemma in educating children from ethnic cultures; as Kalantzis, Cope, Noble and Poynting (1991) argue, immigrant groups do not *necessarily want schools to reproduce their culture, if* that culture is defined within cultural pluralism as their difference, but rather, they may see access as measured in economic and social terms. The respect for difference that is intrinsic to cultural relativism rings hollow when it does not actively promote social access: tolerance of difference can in fact mean toleration of social inequalities. At the same time, 'self esteem' is more likely to be improved by programs which enhance students' potential for educational success than those designed to make students feel good (Kalantzis et al 1991).

The third phase which Lo Bianco defines, the discourse of 'hard-nosed' multiculturalism, has "a strong functionalist, instrumental, pragmatic element" (Lo Bianco 1988, p. 27), with a focus on the needs of society rather than on the needs of the individual groups within it. Thus language issues, including the learning of English as a second language, have predominantly macro-economic and national self-interest objectives. This thinking, at Federal level, is still prevalent in the late 1990's, with funding for ESL programs increasingly linked to 'outcomes' rather than provided on the basis of perceived need. At one level, the outcomes-based approach of the National Statements and Profiles (1994) has been welcomed by teachers, since the inclusion of ESL as an area of curriculum activity legitimates it and offers a common language for ESL and subject teachers to talk about second language learners, their achievements and their needs. At the same time however, common funding arrangements and the conflation of ESL with related areas such as English and LOTE (languages other than English), and most recently with 'literacy' programs, has threatened ESL as a distinct area of expertise and specialist practice

(Davison 1997; Hammond 1997, Lo Bianco 1998). The linking of first and second language and literacy education has the potential to construct ESL as a 'deficit' mother tongue English, to displace the nexus between language and culture, and to lead to a neglect of bilingual and multicultural education (Davison 1997). Davison argues that the current political agenda of the late 1990's, with its concern with system-wide standards, learner commonality, linguistic 'product' or outcomes, and supposed simplicity of accountability, is increasingly at odds with the professional agenda of teachers, an agenda which is increasingly being ignored in the politicisation of education.

In this political context, there is a continuing need for professional support for both ESL and mainstream teachers. One teacher comments:

> I'd have to say it's not enough just to train ESL teachers but to train other teachers about language, to be a bit more sensitive of the needs of students ... no classroom is without ESL students ... it's easy to see in this class that [an] ESL student is fairly lost. Either people don't have the time or they find it difficult to incorporate strategies in their planning to cater for these students ... I don't think it's because the teachers don't want to. I think they haven't got enough time or the training, knowing how to do it.
> (ESL teacher, data from Davison 1997)

This reflects numerous claims over the past fifteen years for similar professional development (see for example the recommendations of the National Conferences on Teacher Education 1983 and 1984; the Campbell Reviews of the Commonwealth's ESL Program 1984 and 1985, including *Bridging the Language Gap* (Campbell and McMeniman 1985); the ESL Factors and Index Study (1985), and the Christie Report 1992). Most recently McKay, in an examination of the relationship between first language development and second language acquisition, writes: "a major common issue in the case studies is a lack of formal preservice preparation and subsequent professional development of mainstream teachers teaching NESB (non-English speaking background) children" (McKay et al 1997). The recommendations in the report include the following:

> Most classroom teachers in these studies indicated a lack of ongoing professional development to assist them to meet the needs of NESB students in their classes. Professional development of mainstream teachers, in conjunction with ESL specialists, is recommended so that

> mainstream teachers will have a better understanding of the nature of second language acquisition in a classroom context (including the role of the L1 and L1 culture in this), will employ more effective strategies to assist ESL learners in the classes, and will recognise the progress and need of second language learners in literacy assessment activities.
> (McKay et al 1997, p. 265)

In line with these recommendations the current study aims to contribute to an understanding of the nature of second language acquisition in a classroom context, and to ways in which ESL learners may be better supported in the mainstream classroom. As Lo Bianco argues:

> Central to ESL is the idea that the acquisition of a second language and the ability to participate fully in formal learning contexts cannot be left to osmotic processes and blind faith ... ESL learning cannot be left entirely to incidental, indirect, inductive or implicit acquisitional processes.
> (Lo Bianco 1998, p. 1)

Deficit Theories of Educational Failure

Among attempts to discover the causes for the academic failure of minority groups have been those which place blame at the personal individual level. At times certain groups have been portrayed as 'genetically' inferior (Jensen 1969). As recently as 1987 in the US, Hispanic pupils and their parents have been explicitly blamed for their educational failure on the grounds that they "have not been motivated and dedicated enough to make the system work for them" (Dunn 1987, p. 65).

More commonly, cultural deprivation theories lay the blame for educational failure within students' home experiences; students are seen to come to school retarded linguistically, cognitively and socially, with blame laid at the door of their bilingualism, perceived parent apathy, lack of cognitive stimulation, or lack of home literacy. The individual learner, usually 'measured' in some way against factors considered important in the middle-class child, is thus found to be disadvantaged or deprived in terms of socialisation practices and home environment (Eckerman 1994). Perceived characteristics of the group to which the student belongs, such as lack of motivation or parental disinterest, have in the past been presented as the cause of educational failure (see for example Bereiter and Engelmann 1967; Hunt 1969). Such theories are summarised by Oakes (1985):

> Most considerations of barriers to educational equality have focused on characteristics of students themselves as the source of the problem. Seen as products of disorganised and deteriorating homes and family structures, poor and minority students have been thought of as unmotivated, noncompetitive and culturally disadvantaged.
> (Oakes 1985, p. 4).

The ideology of deficit is also implicit in school discourse when teachers, albeit well-meaningly, speak of their students as having 'no experiences'. Eckermann, writing in the context of Australia, cites comments from interviews with teachers, (who she claims were deeply committed to their students) which were "firmly steeped in the philosophy of deprivation" (1994, p. 49). Among the teachers' comments, for example, were the following: "[the children] are not getting a lot of input from home"; "socially some of the children are not very well adjusted... some of the children are not exposed to very much culture in their families"; "the values of the school don't seem to be held by the parents"; "there is a lot of poor language development around". My own experience has offered many similar examples. One teacher during a teacher inservice gave an account of the harrowing journey to Australia of one of his refugee students, and just minutes later remarked that the learning problems of his ESL students were due to their lack of experiences. The equation of 'experience' with those experiences valued by the school, (such as excursions and outings of various types), is indicative of the way in which English-speakingness and middle class values are frequently normalised in school. As McLaren suggests, "we naturalise whiteness as a cultural marker against which Otherness is defined" (McLaren 1994, p.114).

Theories of cultural deprivation have been influential in producing large numbers of compensatory programs, which aim to provide those experiences seen as lacking. Although it could not be claimed that such programs have been without value, the assumption that underlies them is one which a more critically oriented approach to pedagogy and to the education of minority students would reject: namely that such children suffer from a deficit in skills which they bring to school, and that the causes for this deficit lie in a lack of appropriate training by parents and caregivers, and in the cultural experiences of the home. One of the more invidious effects of locating a learning 'problem' within the student, or within the student's home background, is that it serves to legitimise existing school structures and approaches to curriculum and pedagogy, because it obscures any need for critical reflection on school

structures and classroom practices and deflects any pressures for change (Cummins 1994, 1996).

Bernstein is similarly critical of the concept of compensatory education, arguing that it detracts attention away from the deficiencies in the internal organisation and the educational context of the school itself (Bernstein 1971). He argues that the speech variants that children need to learn in school, "the universalistic meanings of public forms of thought"[6], which may be less familiar for some children, do not constitute compensatory education. Rather, it is education itself. We may add to these critiques that not only are deficit approaches unhelpful in addressing the educational failure of students, a cultural deficit theory is also profoundly disempowering for teachers, since the problem of 'failing to learn' is then located outside the power of an individual teacher to address.

The deficit model has continued to influence educational thinking in Australia, despite the fact that 'deficit' has in most cases been replaced by the term 'disadvantage' (Eckerman 1994). Moss argues that whatever term is used, and whether or not it is qualified by 'socially', 'culturally' and 'economically', "there is no child who can fit into such a category... education should pay more than lip service to its long-held commitments to pupils as individuals and education as a process of meeting individual needs" (Moss 1973). However Moss also argues that cultural difference prevents students' full participation in the culture of the school, an interpretation which many educators have associated with the concept of disadvantage (see for example the work of those associated with the genre approach discussed in Part 1 of this chapter). The implications of cultural difference on students in mainstream classrooms, to which Moss refers, are discussed below.

Redefining minority students

Linguists have argued for many years that many of the difficulties that minority children experience are the result of sociolinguistic differences between the students and the language and culture of the mainstream classroom (Hymes 1971). These differences are compounded when educators overlook often subtle differences in cultural capital and discourse strategies, and are unaware of the result these differences may have on learning in school (Corson 1993). Lack of positive feedback

[6] A parallel can perhaps be made here between Bernstein's notion of the universalistic meanings of public forms of thought, and Mohans' reference to theoretical and explicit discourse. All students are expected to develop this ability to control such discourse; this, as Bernstein points out, *is* education.

and limited opportunities for the use of their own language or dialect in school mean that, for minority children, the knowledge and power asymmetry that already exists between teacher and students is further widened. A number of studies carried out in the UK, US, Canada, New Zealand and Australia have demonstrated that minority students in mainstream classes, compared with their native English speaking peers, suffer a number of educational disadvantages. For example, they may have fewer opportunities for extended language use with teachers (Au 1978; Cazden 1990; Biggs and Edwards 1991), receive less feedback and participate less often in class discussion (Philips 1972, 1985; Au and Mason 1983; Jones 1987) are asked less cognitively demanding questions and generally have fewer opportunities to talk (Torr 1993); and use discourse structures which are evaluated less positively (Michaels 1981; Malcolm 1982; Heath 1982, 1983; Erickson 1984; Michaels and Cazden 1986). These forms of rejection are usually unintentional but nevertheless may lead to educational inequality. It is also likely that when students' identities are devalued through their personal interactions with educators, academic effort is felt to be futile, and they may withdraw mentally and perhaps physically from the life of the school (Cummins 1996).

Working with American Indian[7] children in mainstream Anglo classrooms, Philips (1985) argues that their efforts to get the floor in the classroom are less often ratified by their teachers, and less often incorporated into the social reality constructed through classroom discourse. Her study provides linguistic evidence that the speech of some students is 'heard' by teachers, in that it is responded to or built on in some way, more than the speech of others. Philips concludes that because Indian children's contributions are judged lacking, they are indirectly defined as less proficient or as unequal to their Anglo peers. The reason for this lack of ratification, she suggests, is that Indian students' notions of a culturally appropriate response are different from those of their teachers. In addition, the daily experiences and common knowledge of the Indian students incorporate cultural elements with which teachers are not always familiar so that when children refer to specifically Indian cultural aspects of their everyday life, their teachers may be unable to build on children's contributions or expand on what they are saying. A study conducted by the US Commission on Civil Rights (1973) similarly found that Euro-American students were praised or encouraged 36% more often than Mexican Americans and that their classroom contributions were used or built on 40% more frequently (cited in Cummins 1996).

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[7] The term *American Indian*, rather than the more recent term *First Nation*, is used here since this is the term Philips herself used in the study.

In the Australian context, studies have also shown the impact of Koori (Aboriginal) values on classroom talk, and the ways in which the interactions that result can be perceived as disruptive by teachers within conventional classrooms (Malcolm 1979, 1982; Malin 1990). Malin considered in particular why aboriginal students who were considered competent and skilled at home were not seen as such at school. Her findings show considerable sociolinguistic differences in the socialisation of home and school. In Aboriginal families, children were taught to be independent and self sufficient. In school this behaviour translated into a preference for helping their peers, and asking them for assistance, rather than enlisting the help of the teacher. Consequently Aboriginal students delayed answering teachers' questions and helped their peers by calling out answers, they received less teacher-guidance since they frequently did not seek it, and the assistance they gave to each other appeared to the teachers as 'disruptive' behaviour. Sociolinguistic variation thus frequently resulted in negative evaluations by teachers.

Where a variation in sociolinguistic patterning is not recognised by schools, it appears likely, then, to result in learning difficulties for some children. It could be argued that where there is such home-school 'mismatch' and it is unrecognised and inappropriately responded to, (for example, by a pedagogy of intense instruction which confines students to a passive role), then learning difficulties may actually be pedagogically induced (Beers and Beers 1980; Cummins 1988). This may result in a cycle of failure to learn, low self esteem, and possibly negative attitudes to the learner by teachers.

By comparison, a number of studies have reported on the positive effects on minority groups' educational outcomes, where there has been a conscious attempt by teachers to respond to minority learners by adapting or changing their own pedagogy and discourse styles, (see for example Au and Mason 1983; Vogt, Jordan and Tharp 1987; Ada 1988; Cazden 1989; Gibbons, White and Gibbons 1994). The educational responses documented in these studies have in common a perspective on minority learners which sees educational failure not as a factor of the learner or their background, but, broadly, as a reflection of wider socio-historical injustices and, more narrowly, of a need for educators and institutions to reflect on and adapt their own practices. The programs in these studies all demonstrate ways in which school curricula and classroom practices have been adapted to be responsive to the needs of students, rather than students being expected to adapt to an (Anglo-oriented) curriculum. A reading of these studies with a Vygotskian perspective also suggests a repositioning of minority education: the success or otherwise of students is implicitly recognised as a factor of the strengths of the

cultural and linguistic frameworks that support their learning. Success or failure is seen as resting not only within the individual, but in the contributions of others in the educational process. The current study further illustrates this notion.

While some sociolinguists have considered the way that features of minority group language and discourse behaviour impact on learners' opportunities in school, other researchers have questioned the way in which societal power structures disadvantage some groups, arguing in particular that educational institutions themselves perpetuate such disadvantages (see for example Jakubowicz 1984; Kalantzis and Cope 1988; Cummins 1988, 1996; Ogbu 1992). Bullivant (1981a, 1981b) argues that educators must consider the dynamics of economic and political power, that is, how and why minority groups are disadvantaged in relation to dominant groups in society. I turn now to this broader socio-historical perspective.

While the kind of curriculum that minority students are taught is important, the effects of teaching programs may be limited, or serve some groups better than others, because they do not address the complex realities that affect the overall relationship between the cultures and languages of the minority and dominant groups (Ogbu 1992). Focusing mainly on black students in the US, Ogbu (1978) suggests that the causes of inequality of educational outcomes are ultimately not to be found within the education system itself, but in wider societal structures related to social mobility and the 'job ceiling'. Post school rewards in terms of employment and social mobility are unequally distributed between dominant and non-dominant groups, and the long term effect of this impacts on student performance. Education, Ogbu argues, does not serve the dominant and minority groups equally; minorities often reject academic competition with the dominant group because their efforts in school have not led to the traditional social and occupational rewards. Lower educational attainment is then functionally adaptive to minorities' actual inferior social and occupational positions, because in the process of socialisation, children acquire the skills, motives, knowledge and attitudes which will enable them to perform adult roles in the way that their society typically conceives them. Inequalities between groups, as manifested in job status, socio-economic background, and educational outcomes, then become 'normalised' by members of the dominant group, and, in the educational context, rationalised through stories and myths about particular groups of students, and perpetuated by educators' lowering of expectations for some groups.

Recognition of the role of sociolinguistic factors and societal power structures in educational low achievement requires an ideological shift away from the deficit

view of 'blaming the victim'. While Ogbu's major thesis concerns the power relationship between majority and minority group cultures, Cummins (1996) presents a theoretical account of minority educational failure aligned to Ogbu's argument. Like Ogbu, what is central in Cummins' account is the dominant/minority power relationship. However he argues that it is possible to reconceptualise this relationship, at a micro level, within the classroom, where it is mirrored in the relationship between teacher and minority student and realised through the interactions they are engaged in. In line with this, the school is seen as an agent of social change whose aim should be to reverse the pattern of dominance and subordination which holds between dominant and minority cultures in the wider society. Just as in the wider society relations of power range from coercive to collaborative, so minority students within the societal institution of the school may be disadvantaged educationally in their interactions with teachers in very much the same way as their communities have been disadvantaged historically in their interactions with the broader society. Similarly Bourdieu (1991) argues that talk is symbolic of the power that an institution gives to the individuals within it, and that in withholding power, institutions maintain and reproduce existing power structures. Such a view locates power not in language per se, but within the institution which defines who has the right to speak and how (Bourdieu 1991). The critical nature of the interactions between educator and student underlies van Lier's assertion that a transformation of teacher/student interactions will "necessarily (though not instantaneously) bring about a transformation of the institution itself" (van Lier 1996, p. 158).

Cummins' thesis rests on the notions of coercive and collaborative power within the classroom. Coercive relations of power refer to the exercise of power by a dominant group to the detriment of a subordinated group, and operate to maintain the division of resources and status in society. In a school context, they frequently invoke the discourse of 'blaming the victim' referred to earlier, as educators look to the perceived characteristics of a group as the cause for underachievement. Thus the effect of relations of power are to further legitimise existing school practices and maintain the status quo. Gutierrez, Larson and Kreuter (1995), for example, show in one study of classroom discourse how a monocultural and monolithic instruction marginalises the linguistic, social and cultural capital of the diverse student population. Gutierrez et al argue that, in the classroom they observed, participation in joint activity was so restricted that fundamental educational goals were subsumed within the goal of social order, producing an institution which valued social order over educational outcomes.

Collaborative relations of power on the other hand operate on the assumption that power is not a predetermined quantity but is something which is generated in interpersonal and intergroup relations. In the process of a collaborative relationship, empowerment for *both* participants is generated in that each is more affirmed in their identity and has a greater sense of efficacy to create change in their life or situation. Within the classroom, Cummins argues, educators should seek to create collaborative relations of power (Cummins 1996), so that through their interactions with minority students they reverse the historical patterns of subordination and coercive relations of power that have characterised relations in the broader society. Thus he argues that minority groups "will succeed educationally to the extent that the patterns of interaction in school challenge and reverse those that prevail in the society at large" (Cummins 1996, p. 137). The way students are defined by teachers is interwoven throughout all classroom interactions. Their identities as learners are created in the way they are both talked *to* and *about:* "culturally diverse students are empowered or disabled as a direct result of their interactions with the educators in the schools" (Cummins 1996, p. 141). Empowering interactions are therefore those which are related to pedagogical approaches that value and attempt to amplify students' prior experiences.

What is significant about this view of the importance of teacher-student interaction is that it acknowledges that individual educators have control over how they define minority and culturally diverse students. Unlike deficit views of the learner, the focus on teacher interaction defines individual teachers, rather than whole education systems, as change agents who are able to make a difference to the individual students they teach. As van Lier argues, "the power of the status quo can only be broken by the power, minute in isolation but invincible in a purposeful project, of transformed interaction between educator and educated" (van Lier 1996, p. 158).

The causes of minority underachievement in part, then, lie in the way in which individual educators define their roles. This notion can be extended to the structures of the school itself. Educational institutions, while they may not be overtly racist, may be *structurally* so if the curriculum and pedagogy militates against successful minority participation and if there is an unjust use of power which creates and maintains minority stereotypes and class distance (Labov 1987; Cummins 1988). Eckermann (1994) states:

> Institutional racism is covert and relatively subtle; it originates in the operation of essential and respected forces in the society and is

> consequently accepted. It manifests itself in the laws, norms and regulation which maintain dominance of one group over another. Because it originates out of society's legal, political and economic system, it is sanctioned by the power group in that society and at least tacitly accepted by the powerless, it receives very little public condemnation. (Eckermann 1994, p. 33)

Arguing an explicitly reformist agenda, and going beyond arguments resting on sociolinguistic difference, Cummins (1996) suggests four critical areas which maintain institutionalised racism and impact on the academic success of minority students: the degree of cultural and linguistic incorporation within the curriculum, the degree of community participation; the pedagogy; and the assessment practices. Each of these can be analysed along a continuum, with one end reflecting an antiracist orientation, and the other a more traditional Anglo-conformity orientation. Cummins argues that a school which is responsive to its multicultural population is one which is inclusive of the language, culture and community of its students, takes an 'interactive' rather than a 'transmission' based approach to teaching and learning, and avoids culturally and linguistically biased assessment practices, such as standardised tests, which legitimate students' failure to learn because they locate the learning 'problem' within the individual. Where schools have an orientation towards traditional Anglo-conformity and define their roles narrowly and in a mechanistic way as transmitting a body of knowledge and skills to students, minority students are likely to become "disabled" (Cummins 1994). Cummins' argument suggests the need for critical reflection by educators in relation to these four areas. Teachers can become agents of change, by working together to collaboratively critique existing school practices (Faltis and Hudelson 1994), and working towards a more just and democratic society (Edelsky 1993). This might include, in the case of schools where minority children enter school without control of the language of instruction, a more reflective and critical approach by teachers as to how language is used in their classroom. An example of the kind of linguistically informed orientation to curriculum which may result is illustrated in this study.

The definition of learners as inferior, deficient or incapable, (whether or not this is explicitly articulated), leads to a pattern of interaction which is confining and constricting either psychologically or academically (Cummins 1996). Low teacher expectations toward children (often those already most unfamiliar with the language of school) mean that teachers tend to provide fewer opportunities for academic development, thereby confining students intellectually (Au 1980; Gumperz 1980; Oakes 1985; Torr 1993). Oakes' study (1985) on how schools

'structure' inequality illustrates the constraining effects of a reductionist curriculum and low teacher expectations on students' academic development. In considering the question of 'who learns what', Oakes draws on high school data collected in interviews with students and teachers, and examines textbooks and teachers' programs. In particular she focuses on the differences between the educational experiences and the attitudes of teachers and students between students placed in high streams, and those placed in low. Her study shows the ways in which teachers' perceptions of the characteristics of the groups of students they teach legitimise existing practices, and suggests that the way in which knowledge is distributed in some schools leads to structural inequalities. When asked the most important thing they had learned or done so far in their class, high-stream secondary students tended to answer in ways that reflect higher order learning. By contrast low-stream students tended to emphasise learning for the here-and-now, and the mastery of low level skills; their responses included, how to get a better job, how to act when at an interview, how to fill out a form, how to cook and keep a clean house, and how to spell words. An examination of the content of lessons, and teachers' perceptions of what they hoped students would learn, uncovered the fact that desired attitudes and behaviours were seen as different for the two groups. The researchers make the point that while they do not consider valueless the knowledge and attitudes that low-stream students were learning, they have little 'exchange value' and offer little access to educationally or socially important learnings. Basic functional skills, good work habits and the ability to follow directives work to keep the current social system functioning, but do not provide students with the means to life choices. Thus the way in which students were defined resulted in the maintenance of the status quo, and of existing social and economic differences between groups of students. In addition, teachers estimated that in high track classes approximately eighty per cent of class time was spent on instruction (as opposed to student discipline and general classroom routines) whereas in low track classes it dropped to approximately sixty-seven per cent, findings which were substantiated by observers and students. When this time difference is converted to actual time over several years, it is clearly inequitable, if we believe that active student learning is critical to achievement outcomes. Oakes' insights are relevant in considering how far the status quo of minority students is similarly maintained through their educational experiences.

To the finding of Oakes' study can be added, from a Vygotskian perspective, that learning which is oriented towards actual, rather than potential, levels of development is also more likely to constrain the language development of minority groups. Vygotsky (1978) points out that more traditional forms of 'special

education', where the pedagogical orientation is towards the use of concrete, look-and-say methods and where tasks involving more abstract thinking tend to be eliminated from the curriculum, actually *prevent* students from any chance of developing what is lacking in their own development. It can be suggested that this is likely to occur in schools which have low expectations of ESL students' performance, focus on their current abilities in English language, and present a curriculum heavily weighted towards concrete learning and tasks which are reduced in cognitive demand. Vygotskian theory would suggest that it is precisely because students are less likely to have yet developed the academic registers of the classroom that the school must make every effort to support such development, rather than teaching a less demanding curriculum.

Since schools have always reflected the values and attitudes of the broader society, the interactive process between educators and students is less problematic where there is a socio-cultural and linguistic match between them (Heath 1982). However where this is not the case, when children do not share the culture and language of the dominant group, patterns of interactions and the 'hidden messages' they convey can construct students as learners in ways which work against successful academic outcomes and may further compound any preconceived ideas of learner deficit. The work of Cummins' and others which has been discussed here underlines the fact that interactions in the classroom between students, and between teachers and students, can never be neutral, but that in the process of whatever 'instructional' function they may be serving, (such as, in this study, developing students' understanding of science), they are simultaneously realising relations of power which construct how students are positioned as people and as learners. The ways in which relationships are constructed are a powerful indicator to students about how they are viewed: "children are aware, albeit not at the theoretic level, of when they are being treated as persons in an educational relationship and when as mere instructional objects" (Young 1992, p. 67).

These issues are discussed further from a more linguistic and discourse perspective throughout this study, in particular in relation to the way that students are positioned as learners in the interactional patterns between teachers and students. At this point, it is sufficient to note that a discussion of minority students' academic learning should not be considered in isolation from the social relations constructed in the discourse of the classroom.

Issues of social justice

The dilemma of a simple pluralist notion is how to reconcile the concerns of individual cultural identity with equality of educational outcomes. Concentration on the private domain may divert attention away from the real issues of inequality and discrimination in the social domain (Kalantzis and Cope 1988). Making a similar distinction between the private and the social domains, Bullivant (1981b) argues that a multi-ethnic society such as Australia is not pluralist at all levels. While it is pluralist at the family, community and private levels of ethnic group life, it is integrated at the institutional level of society, such as government, the law and the economy. It can be argued, then, that educational systems must incorporate *both* domains in their response to cultural and linguistic diversity.

A critique of education which focuses primarily on the 'private domain' is presented by Delpit (1988), in relation to the education of Black children in the US. She argues forcibly that while liberal educators argue for a curriculum which reflects minority *groups' life experiences and world views, alternative world views* have rarely been sought in the development of many now generally accepted 'progressive' ideas and liberal views of education. Examining this schism between liberal education movements and non-White, non-middle class teachers and communities, Delpit argues that, because classrooms are sites for the enactment of power, and because the codes of participation by which they are governed are a reflection of the rules of those who are already dominant, the 'rules' of power must be made explicit to non-dominant groups. In addition, educators need to be aware of the power they hold. Delpit points out that if you are not already a participant in the culture of power, being told explicitly the rules of that culture makes acquiring power easier. Entering a new culture is easier, "both psychologically and pragmatically", if information about the appropriateness of behaviour is made explicit to those outside the culture, rather than being conveyed as implicit codes, as it would be to those who are members of the community by birth. She concludes: "unless one has the leisure of a lifetime of immersion to learn them, explicit presentation makes learning immeasurably easier" (Delpit 1988, p. 283).

In addition, those with power are frequently least aware of, or least willing to acknowledge, its existence. Middle class liberal educators may not perceive the kind of power they exert over non-dominant groups. While they may seek to reduce the power differential with their students, the effect is frequently to increase it, since instructions and information become increasingly less explicit as a result. Although they may argue along the lines of desiring the same education for all, if this means

that schooling simply reflects liberal values and aspirations, then it maintains the status quo and ensures the culture of power remains in the hands of those who already have it:

> Some children come to school with more accoutrements of the culture of power already in place — "cultural capital" as some critical theorists refer to it — some with less. Many liberal educators hold that the primary goal for education is for children to become autonomous, to develop fully while they are in the classroom setting without having arbitrary, outside standards forced upon them. This is a very reasonable goal for people whose children are already participants in the culture of power and who have internalised its codes. But parents who don't function within that culture often want something else. It's not that they disagree with the former aim, it's just that they want something more. They want to ensure that the school provides their children with discourse patterns, interactional styles, and spoken and written language codes that will allow them success in the larger society.
> (Delpit 1988, p. 285)

One clear implication of this thinking is that the educational curriculum must include explicit teaching to minority groups of those forms of language which will enable them to succeed in school and actively participate in the dominant community, an argument also presented by critiques of progressive education in Australia (see Part 1 of this chapter). Delpit points out that where educational standards are not accorded a high priority for minority students, then, no matter how friendly, egalitarian and caring the environment, classrooms may still operate to oppress students, even though in a benign and less obvious way. The lack of willingness to be explicit may be attributed to teachers' unwillingness to exhibit power in the classroom, yet this very inexplicitness, whether it is about rules of conduct or forms of writing, often ensures ultimate failure for many students. Moreover, making rules and expectations explicit to students is not in itself inconsistent with liberal principles, nor does it limit students' freedom and autonomy:

> Pretending that gatekeeping points don't exist is to ensure that many students will not pass through them ... I prefer to be honest with my students. Tell them that their language and cultural style is unique and wonderful but that there is a political power game that is also being

> played, and if they want to be in on that game there are certain games that they too must play.
> (Delpit 1988, p. 292)

The notion of 'explicitness' is a recurring theme in the current study which shows how it is played out in the discourse of the two classrooms.

Delpit's claims about the teaching of writing embody questions which lie at the heart of much of the debate about the goals of minority and multicultural education: whether the educational process should aim to affirm and encourage diversity and the rights of all children to their own language and culture, to develop students' identities and to accept all forms of language expression as equally valid; or whether it should aim to teach those forms of language and ways of knowing which are the heritage of those already in positions of power. The two positions however present an inherently false dichotomy:

> Those [teachers] who are most successful in educating black and poor children ... understand the need to help students to establish their own voices, but to coach those voices to produce notes that will be heard clearly in the larger society.
> (Delpit 1988, p. 296)

While arguing for an explicit teaching of the dominant language to minority students, Delpit and others (Walsh 1991; Corson 1993; McLaren 1994; Cummins 1996) adopt a more critical view than a simple additive approach might suggest, arguing that students should not be taught simply to *adopt* new codes in a passive way, but should also learn to critique them, so that they recognise both the arbitrariness and the political power of the new codes, and can understand the power realities.

This view of education calls into question the teacher's role, and how the reality of power is played out within it, an issue which is addressed in Chapter 6. Freire (1995) makes a distinction between an 'authoritative' and an 'authoritarian' teacher, arguing that the authoritative teacher is able to foster learners' critical capacities in the way that a 'facilitator' cannot:

> When teachers call themselves facilitators and not teachers, they become involved in a distortion of reality. To begin with, in de-emphasising the teacher's power by claiming to be a facilitator, one is being less than

> truthful to the extent that the teacher turned facilitator maintains the power institutionally created in the position ... the facilitator still grades, still has certain control over the curriculum, and to deny these facts is to be disingenuous. I think what creates this need to be a facilitator is the confusion between authoritarianism and authority. What one cannot do in trying to divest of authoritarianism is relinquish one's authority as teacher ...
>
> A better way to proceed is to assume the authority of a teacher whose direction of education includes helping learners get involved in planning education, helping them create the critical capacity to consider and participate in the direction and dreams of education, rather than merely following blindly.
> (Freire and Macedo 1995, pp. 378-379)

The next section addresses some of the issues around critical approaches to pedagogy which are suggested by these arguments.

A critical approach to pedagogy

At the heart of all critical pedagogy, whether its particular concern is with gender, class or other social issues, lies a notion which has already been referred to: that schooling is inherently biased towards reproducing the status quo and dominant culture. It can be argued that since a critical approach to pedagogy is based on principles of social justice it is therefore necessarily partisan:

> any worthwhile theory of schooling must be partisan. That is, it must be fundamentally tied to a struggle for a qualitatively better life through the construction of a society based on nonexploitative relations and social justice.
> (McLaren 1994, pp. 176-177)

McLaren's discussion of hegemonic relations is consistent with Cummins' view of coercive relations of power, and reflects the way in which institutional racism is enacted (McLaren 1994). McLaren defines hegemony as the way in which domination is maintained not by force or direct coercion or the construction of harsh regulations, but

> rather through the general winning of consent of the subordinate class to the dominant class. The dominant class need not impose force for the manufacture of hegemony since the subordinate class actively subscribes to many of the values and objectives of the dominant class without being aware of the source of those values or the interests which inform them.
> (McLaren 1994, p. 177)

The dominant culture frames the ways that members of a society see their own lives and experiences by providing what McLaren refers to as the terms of reference against which individuals are expected to live their lives. In the school context, for example, examples have already been given of how such frames of reference may operate: they include the way in which some kinds of responses to teacher questions are validated or ratified over others, the values and judgments of the teacher, the codes and maintenance of social behaviour, and also the visual and written texts of the classroom. The ideology which is supported by this hegemony is usually invisible, and thus becomes the norm, the natural way of things, the common sense view of the world. A critical approach seeks to make this ideology visible by interrogating the common sense view. The challenge for teachers is therefore to first recognise and then change undemocratic features of hegemonic control in the classroom. Yet as McLaren points out, these are precisely the features which are rarely challenged because they have been for so long normalised that they are viewed as 'natural'.

A similar view is put by Young, who states:

> Ideology critique thus concerns itself with concealed practices which create such meanings and the general dispositions to accept rather than to inquire into them, and so distinguish between authority which is justified and that which is not.
> (Young 1992, p. 53)

One example of such a 'concealed practice' which is of particular relevance to this thesis, is found within the unmarked (and often unremarkable) discourse practices of the classroom. Earlier discussion referred to the three part dialogic pattern, or IRF, which serves to allow the teacher to control, perhaps totally, the thematic development of a topic, and to maintain the teacher-student power relationship embedded in classroom life (Lemke 1990a). A critical approach to pedagogy would involve considering what ends such unmarked patterns might be serving, both overtly and covertly. It could be questioned, for example, whether triadic dialogue is

simply leading uncritically to the reproduction of mainstream thinking and values, and how such discourse positions the learner.

Gutierrez et al's notion of 'script' is useful here, to characterise the expected pattern or orientation that serves as a framework for classroom participants (Gutierrez et al 1995). Gutierrez et al argue that the dominant script is that of the teacher, and represents beliefs about the nature and function of teaching held by the teacher and the wider community. They show how this emphasis on social order restricts not only the kinds of knowledge to which the students are given access, but also how they are given access to this knowledge, and how the scripted pact maintains the power relations of the classroom by excluding voices which do not follow the unspoken rules. The study shows how Nora, a poor Latina foster child, is marginalised by the teacher and by the other students through her verbal and non verbal resistance to the teacher's script. The researchers argue that this "ironic rekeying of classroom behaviour" reveals the scripted and inflexible nature of a classroom which consistently excludes marginal voices such as Nora's, but that this at the same time creates the possibility of a challenge to the scripted pact by providing for the possibility of *dialogic* change. They conclude that:

> what the analysis ... indicates is that the voices of these marginal students are imminently valuable in that they have the potential to force teacher and students out of their mutually confirming scripts and to recognise alternative forms of classroom practice ... Although the practices in this classroom are embedded within a larger culture, the potential of the classroom as a locus for social change lies in directing this teacher's discourse away from the transcendent script and towards the students and their diverse perspectives and experiences.
> (Gutierrez et al 1995, p. 438)

The authors suggest that such alternative practices be based on dialogic interaction as a means for scaffolding learning, rather than on the monologic and restrictive interaction described in the study. Part of the focus of this thesis is to locate and describe such alternative practices, and to offer some alternatives to the kind of restrictive discourse practices that Gutierrez et al describe. Young (1992) argues that a search for alternative practices involves a choice between authoritarian and discursive approaches to the way that knowledge itself is constructed and presented, a theme which was explored at the end of Part 1 of this chapter:

> We must choose whether we take as our model the typical authoritarian asymmetry of the scientist's communication with the layperson, or a discursive model. The former approach has already been with us for a long time, in the communicative relationship of imperial power with colonised cultures, and the imperialism of science and administrative rationality against everyday culture. Perhaps it is time we tried the alternative?
> (Young 1992, p. 125)

Thus the *way* that learners come to know is of critical importance if children are eventually to be creative and critical participants in society.

Conversely, the more that knowledge is based on social influence, authority and power, the less likely it is that learners will develop the problem solving skills and the skills of critique that Young argues will be increasingly important for the future. Young argues that schooling can no longer simply be aimed at producing a mirror image of the older generation. Instead what should be encouraged is the development of co-operative, holistic, problem-solving strategies, through an education based on what he refers to as a 'discourse model' for classroom talk. Thus we are led back again to Lotman's notion of text as a thinking device, discussed in the first part of this chapter, and to the notion of a discourse model for classroom talk. Such a model involves a curriculum which is 'open to inquiry', which for learners means:

> being aware of *the processes that produced the knowledge*, having some practice in open-ended inquiry for themselves, and/or awareness of the ongoing inquiry — the contemporary discourse — and some degree of access to that discourse".
> (Young 1992, p. 13, my italics)

Young argues that a discourse classroom is one which is characterised by the suspension of judgement and one where the gathering of more evidence is encouraged. Where a teacher does not use learners' creativity and capacity for rational exploration as a resource for learning, "the rejected creativity of the learners can nonetheless find its fulfilment in rejection of the teacher" (and we could add, as both Cummins and Ogbu suggest, in the rejection by minority learners of the education process in general).

PART 4: MAKING CONNECTIONS

The final section of Chapter 2 draws on the previous discussions to suggest a theoretical 'profile' of a classroom which is inclusive of ESL students' language and curriculum learning, and in which they are positioned as active and able learners. It also draws together a number of common themes in the three areas covered by the review.

In Vygotskian theory, in second language acquisition research and in critical approaches to minority education, the role of spoken interaction is foregrounded. Although, as the reviews have shown, the rationale for an interactive classroom is different in each case, the three domains have in common a primary concern with the role of interaction in the process of learning.

As discussed earlier, neo-Vygotskian approaches to education see interactions between teacher and student as central to the learning process. External dialogue is seen as the source of inner thinking, and talk between 'expert' and 'novice' leads the development of learning. Spoken discourse mediates students' apprenticeship into a discipline, as they talk their way into an understanding of key concepts. SLA studies also suggest ways in which interaction is critical to the acquisition process, foregrounding the importance of student output and interactional modifications. Critical approaches to minority education also see the kinds of interactions in which learners take part as a partial explanation for learners' educational success or failure, and argue that students are positioned as learners by the way educators speak to and about them: interactions between educators and students are never 'value neutral'. Clearly then, a classroom which is to be responsive to the needs of minority learners must place a high priority on classroom practices which incorporate interaction between participants.

Equally however, it is clear that interaction per se is not of itself necessarily supportive of learning; rather it is the quality of interaction which is critical. Neo-Vygotskian approaches argue for the dialogic function of text, an active stance towards ideas, so that spoken discourse becomes a thinking device and the ideas of all participants can be challenged, clarified or modified. This focus on a more equal status between participants is also compatible with the notion of collaborative rather than coercive relations of power between educators and minority students. The responsive quality of interactions has several times been referred to as 'contingency', characterised for example by how well an adult judges, on the basis of

moment-to-moment understanding, the pacing, type and amount of help required by a learner. The notion of contingently responsive interaction suggests certain kinds of teacher-behaviours, such as that teachers check they have understood correctly, negotiate misunderstandings, and sustain student-initiated topics. SLA research argues, more specifically, for the value of clarification and confirmation checks, and for students to be given some freedom in initiating topics and exchanges rather than simply responding to the teacher's choice of topic. Contingent interactions are thus central to the kind of discursive classroom suggested by neo-Vygotskian educational approaches, to the interpersonal relationships between educators and students suggested as critical in the education of minority groups, and to the kinds of interactions seen as enabling of second language development. A classroom supportive of minority learners will therefore be rich in interactions which can be described as contingently responsive.

It has been suggested at several points in the reviews that explicitness about both the content and procedure of lessons is a key factor in enabling minority students to learn to participate in the mainstream classroom, and more broadly, to gain access to the dominant culture. The expert/novice relationship inherent in the construct of the ZPD likewise suggests explicit teaching. The explicitness of (native-speaker) interactants' responses in feedback also appears to be a factor in successful language learning, with importance given to contexts where 'noticing' is likely to occur. Reflection on learning is also a recurrent theme, including reflection on individual learning, and metalinguistic reflection on language itself.

Previous discussions also support the need for classroom practices to focus both on the process and products of learning. A discursive classroom allows a focus on the processes of learning, the way in which learners come to know; students will generate as well as gain new knowledge and discourse. In the review of minority education, it was argued that a responsive and critically oriented classroom is one where learners become aware of the processes which produced particular knowledge, and have some practice in open-ended enquiry themselves. Many of the studies cited in the SLA review also focus on the interactional processes by which learners increasingly approximate the target language. Equally, a view of learning which sees it as the cognitive and linguistic socialisation of students into the culture of the school must also place emphasis on the products of learning, the texts and genres which give access to power within the dominant culture, and the skills to critique it. To achieve this, the curriculum must be one which is academically rigorous, one which has the 'exchange value' needed for learners to participate in the mainstream culture.

The need for communicative competence to include sociolinguistic competence in academic contexts is also a recurring theme in several of the studies reviewed. Studies carried out in immersion classrooms have argued for the need for ESL programs to take account of the academic learning needs of second language speakers. A supportive classroom is therefore one where students have access to registrally appropriate models of language, used in authentic and purposeful contexts, and this includes the use of the more context-reduced discourse associated with academic learning.

On the basis of SLA studies, it can also be argued that a supportive classroom is one where there are opportunities for students' language to be 'stretched' in contexts requiring more extended language use. Tasks which incorporate an information 'gap' are likely to be a feature of the classroom since it would appear that these create the need for the kinds of interactional modifications believed to be important for language learning. It would also seem there needs to be some balance between group work and teacher-directed work, (although the literature does not suggest what this balance might be or how it might be achieved).

This profile is not of course a definitive one. Nothing has been discussed here regarding the use of the first language, nor has mention been made of the ways in which the content of the curriculum can be more or less inclusive of minority learners. However, in terms of the concerns of this thesis, the profile suggested here provides some key criteria against which the data will be read.

CHAPTER 3

Researching the Classroom

We seek not to prove but to understand.
(Block 1996, p. 77)

INTRODUCTION

Chapter 3 discusses the methodology used in the study. It situates the approach taken within a range of methodological options, and argues that this approach is congruent with the aims of the research.

Part 1 discusses the methodological approach used and its rationale. It argues that different kinds of knowledge require different kinds of research approaches. It goes on to discuss the implications that qualitative approaches have for the relationship between teacher and researcher, including ethical considerations, and for data collection and interpretation.

Part 2 describes the school and community which provided the site for data collection and includes a description of the community, the teachers, the children and the teaching programs.

Part 3 describes the data sources and the range of approaches used in their analysis and interpretation.

Part 4 describes the model of language which underpins the interpretation of the discourse. It argues that this language model is a particularly appropriate one for researching the classroom, and that in this study it serves to inform and unify the range of analytical approaches used. Most importantly, it is congruent with the methodology and broader aims of the research.

A glossary of linguistic terms is at the end of the chapter.

PART 1: THE STATUS OF PRACTICE: THE METHODOLOGICAL APPROACH

'Kinds of knowledge': a rationale for the approach

The methodological approach taken, and the procedures and methods used, depend on the objectives and purpose of the research. They are also implicitly or explicitly informed by the theories and assumptions held by the researcher (Simon and Dippo 1986; Norton Peirce 1995): "all methods are ways of asking questions

that presume an underlying set of assumptions" (Simon and Dippo 1986, p. 195). The theories and assumptions that impact on this study include knowledge and belief systems about teaching and learning, and about language itself; the way in which the endeavour of educational research itself is conceived, including the status and place of 'theory' and how such theory should be constructed; and how the relationship between researcher and researched is viewed, (for example, how the teachers and students in the research are positioned, who the 'experts' are and the status of the 'knowledge' they hold). Also relevant in methodological considerations is the possible use to which the results of the research will be put, the context in which such application will occur, and the kinds of knowledge which the research seeks to contribute to. This chapter discusses how these considerations have impacted on the methodology of the research, and makes explicit the philosophical and theoretical principles which guide and shape the research. It therefore seeks to put 'up front' my assumptions as researcher.

This is a study about learning and teaching: it seeks to identify in particular how classroom discourse can contribute to the language development of minority groups who have traditionally not experienced success in school. Any insights that result will therefore have pedagogical implications. This pedagogical purpose shapes, at every point in the research, the methodological options chosen. It has influenced the choice of research site, the kinds of relationships developed with teachers and students, the choice of an interpretive qualitative approach, and the kind of analyses used.

Research paradigms should not be viewed as competing, but seen as useful for different purposes (Lakatos 1978). Rather than beginning with outlining the distinctions between qualitative and quantitative research then, a more useful starting point is the question of what *kinds of knowledge* might be useful in order to investigate second language development. Much of the work in this area has focused on what learners can say, rather than what they can do with language (van Lier 1988), with the SLA field often dominated by narrowly prescribed research methods (van Lier 1994). For the last two decades, SLA researchers have tended to view SLA as a mental process, and have generally adopted research approaches which are dominant in psychology, and characterised by the perspectives of mentalism and individualism. These are based on positivist approaches which seek 'objective', hard data and aim to produce replicable findings (Davis 1995), leading

to accusations of 'science envy' (Block 1996)[1]. Such approaches commonly utilise experimental research designs and paradigms and draw on statistical analyses. This focus on cognitive factors has been challenged, not on the grounds that it is irrelevant, but because if there is an expectation that this is the dominant line of enquiry for the entire field, it may lead to a narrow view of what is a complex phenomenon, and to a further widening of the gap between researchers and practitioners (Block 1996). While such research has considerably increased understanding of the 'mental' aspects of second language learning, for instance in relation to an individual learner's syntax development and acquisition strategies, this is not the approach taken in this study. Like Breen (1985) I believe that

> If our goal is to move closer to the realities of language learning and to understand the experience of discovering a new language in a classroom group, then such an audacious enquiry demands anthropological sensitivity.
> (Breen 1985, p. 151)

Davis argues that all research is informed by the 'grand theories' held by the researcher, which should be articulated at the onset of the study (Davis 1995). Likewise Ernst-Slavit refers to 'theoretical anchors' (Ernst-Slavit 1997). The theoretical guiding principle underlying this study is that while mental processes are not unimportant, *language development interacts dynamically with the sociocultural contexts in which it occurs and cannot be analysed or understood apart from its situational and cultural contexts.* Research which seeks to address language in its situational and cultural context is best served by qualitative approaches which can offer "an alternative to mainstream SLA research in viewing acquisition not only as a mental individualistic process, but one that is also embedded in the sociocultural contexts in which it occurs" (Davis 1995 p. 432). Although this concern with the social and situational context is increasingly evident in more recent studies of minority groups and of second language development (for example Breen 1985; Faltis and Hudelson 1994; Norton-Peirce 1995; Lazaraton 1995; Angelil-Carter 1997; Ernst-Slavit 1997) and in research focusing on the social nature of interactions in the second language classroom (for example Prabhu 1992; Torr 1993; van Lier 1996), there is still in general a dearth of socially situated SLA studies (Davis 1995).

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[1] See for example the extended debate and range of stances taken in *Applied Linguistics* during 1993 -1996, and in particular the paper by van Lier (1994).

The term 'qualitative' is also itself problematic. Qualitative studies may be defined as simply those that utilise non-quantitative techniques, yet this limited definition ignores the philosophical and theoretical considerations on which qualitative research is based and may lead to the conclusion that qualitative research, when seen through positivist eyes, is not rigorous or 'legitimate' (Davis 1995), a point which is taken up further later in this chapter. Qualitative research has its origins in anthropology and sociology, but within this broad framework a number of approaches are included and overlap. The meanings of *qualitative* and of the terms it overlaps with, such as *ethnographic, case study, participant observation, interpretive* or *discourse analysis,* are loosely defined (Hammersley 1994). Qualitative studies that take a semiotic approach are frequently referred to as interpretive. The interpretive label too has been used to cover a wide range of studies, including loose ethnographic accounts, more systematic and rigorous ethnographic approaches, commentaries on how teachers control knowledge, and formal systematic structural analyses of the organisation of turn taking (Edwards and Westgate 1994). One helpful distinction often made between interpretive and ethnographic approaches is that the former focus on the co-construction of meaning within a particular social setting (in this study, the classroom), whereas the latter focus on the shared meanings of a particular social or cultural group (Davis 1995). From this perspective the approach taken in this study is primarily an interpretive and semiotic one: what is important is the immediate and local meanings of the actors (teachers and students) understood in terms of social action. At the same time, the research can be described more broadly as ethnographic, in that it has many of the features noted by Hammersley (1994). It is concerned with the analysis of data from real-world contexts; it takes data from a range of sources; the approach to data collection is unstructured, in that it does not follow a detailed plan set up at the beginning; the focus is a single setting or group; and the analysis of data involves interpretation of the meanings and functions of human actions, and mainly takes the form of verbal descriptions and explanations (Hammersley 1994, p. 2). While the focus is on what is 'observed', the findings are contextualised within a social, cultural and historical framework. Thus this study uses an interpretive and ethnographic approach in order to foreground the situational and cultural factors that impact on language development.

It has been suggested that educational research in schools has in the past tended to define problems in terms of variables common to all schools, with the unique and the particular seen as not relevant because they are not generalisable (Hymes 1981). Yet in anthropology the particular is of inherent interest: something new and particular 'counts' as knowledge. Many of the questions of relevance to SLA

research, at least that which is concerned with pedagogy, can be better addressed within an interpretive paradigm. In relation to a theory of L2 classroom development, for example, van Lier argues for:

> [a theory] that allows us to answer the questions ... Does it [classroom development] make a difference? How effective is it? How can we improve it? What kind of world is the classroom? What is its place in society? How does it turn out the way it does? How differently can it turn out in different circumstances?
> (van Lier 1988, p. 9)

Though it may be possible to address some such questions using quantitative empirical approaches, it can be questioned how far these approaches are able to tell us about *how* certain activities unfold, for example, *how* students should be interacting for optimal language development to occur, questions which are highly relevant for language pedagogy. As Block (1996) suggests:

> If we adopt a view of the classroom as a social context, our point of departure is not a quest for a theory of SLA for all of humanity but a modest attempt to understand language teaching in situ.
> (Block 1996, p. 76)

The value of *a priori* claims often made by qualitative interpretive research is sometimes questioned on the basis that such claims are in one sense telling us only what is already known (Heap 1995). However this in itself is one of the strengths of interpretive research in classrooms: as Mehan (cited in Edwards and Westgate 1994, p. 59) comments, the highest compliment which a piece of classroom research can elicit from practitioners is 'Ah yes, of course!' By relating the particular and observable to the general, the claims which such studies produce offer important and relevant kinds of knowledge and insights for educational research.

Understanding the real importance of *a priori* claims means considering in more depth what it means to 'know' something. What we 'know' is often stored intuitively or implicitly learned. Thus a child may 'know', at a subconscious level, how to participate as a student in a classroom, or a teacher may 'know' what helps students learn language. But the child and the teacher may not necessarily be able to put this into words, because such knowledge is not necessarily stored in propositional form (Heap 1995). And unless such knowledge is 'propositionalised', through being articulated, it cannot be reflected on, or fed back into the classroom

and into curriculum design. I suggest that this is the real importance of qualitative approaches for educational research: that they recast teachers' innate understandings as educationally 'useable' propositions.

There are also clear implications here for the role of teachers in educational change. To theorise this further I turn briefly to Leont'ev's analysis of activity (1981)[2]. He proposes three strata of activity, each of which provides a different perspective on how events within a culture are organised: *activity, action* and *operation. Activity* can be identified according to its motive, or goal; in Cole's words, "an activity is coextensive with the broadest context relevant to ongoing behaviour" (Cole 1985, p. 152). Thus the activity with which this thesis is concerned is that of education. In order for an activity to be realised, it needs to be translated into *action*. Thus activities are composed of actions, and actions involve consideration of the specific goals embedded in the activity. Actions thus represent intermediate steps in satisfying broader goals. Actions are in turn realised through certain means, which are represented by the notion of *operation*. Since action is goal directed, participants are consciously aware of attending to it. The means by which it is done, however, (the operation) is often routine, and below the level of conscious attention. At times, operation can cease to be at an unconscious level, as for example, when participants' attention is drawn to the means by which the action is being carried out. Then participants may have to attend more to what they are doing, so that, at least for a while, what has been previously automated temporarily receives conscious attention and itself becomes action (Wells 1996).

Earlier it was suggested that ethnographic research can articulate the intuitive behaviour of teachers. Since such research is able to bring to consciousness previously unnoticed, unremarked and routinised behaviour, it provides the means to disrupt this behaviour, such as, for example, the routinised (and, as Chapter 2 has suggested, frequently constraining), discourse patterns and responses teachers commonly employ in their classrooms. In terms of activity theory, such reflection, leading to a more conscious approach to talk, has the potential to disrupt *operation*, that is, the unconscious behaviours of teachers. Where this disruption leads to changes of behaviour, such changes in turn change the nature of the *action*, Ultimately, since *action* realises *activity* , the *activity* (education) is also changed.

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2 The use of the term *activity* here refers in its broadest sense to the whole enterprise of education. Where it is used in this way, referring specifically to Leont'ev's notion of *activity theory*, it will be made explicit in the text. Otherwise the term *activity*, as used in this thesis, may be taken to refer, in its more usual sense, to a single pedagogical event; I refer, for example, to the carrying out of an experiment, or the reporting back of findings, as classroom 'activities'.

'Articulating the intuitive' thus, in terms of activity theory, has the potential to lead to educational change: as van Lier (1996) has argued, interactional change can lead to educational change.

Ultimately, the debate over methods of inquiry is a debate about one's world view and the nature of knowledge. Taking a more pragmatic view, it can be claimed that specific *methods* have no paradigm implications, and that all data collection procedures are legitimate for almost all research designs, though some may be more typical of one design than another. However at the level of the grand theory, different paradigms picture the world in different and sometimes incompatible ways, so that data are likely to be interpreted differently by those working in different paradigms (Hammersley 1994).

The debate perhaps finally rests on whether the researcher holds that there is some objective 'truth' to be discovered, independent of the observer. In many fields, even in science, this has become a questionable assumption. It is even more questionable in fields which have to do with something as complex as human behaviour. Throughout this study, and as Chapter 2 has argued, I take the epistemological position that knowledge is co-constructed, not an 'entity' that is transmitted. The study itself argues that there are alternatives to the traditional, teacher-directed and logical empiricist view of learning in schools. It would be inconsistent, therefore, to take a position in relation to my own methodology which is fundamentally at odds with this.

A theory of theory-construction, and its implications for the researcher-teacher relationship

In this section, I outline a theory of theory construction which is consistent with the aims and rationale of this study, and consider implications for the research process. I begin with some personal reflections about the nature of teacher development.

My experience, first as a consultant for many years, and then as a researcher, suggests three ways in which this relationship may be constructed. Teachers may view the researcher as someone who holds the key to good practice, who 'knows the answers', and so defer in their own judgments about classroom practices to the supposed authority of the 'expert'. Some researchers too may suffer from this delusion. Teachers often have little power in how such a relationship is constructed; that power tends to rest with the researchers since they are generally the ones who

get into print. Clarke (1994, 1995) characterises the typical power relationship between teaching and research in this way:

> I do not dispute the assertion that individuals who conduct research on language learning and teaching can provide information and insight for teachers, but I believe that the relationship in the profession is unnecessarily hierarchical, and that *experts* are generally accorded a disproportionate amount of time and space to accord their views.
> (Clarke 1995)

A similar point is made by Kumaravadivelu who argues that "theorizers have traditionally occupied the power center of language pedagogy while the practitioners of classroom teaching have been relegated to the disempowered periphery" (Kumaravadivelu 1994, p. 29).

A second way in which the teacher-researcher relationship is constructed, and perhaps in reality a more likely one, is that teachers view research (and researchers) as irrelevant to the real business of the classroom, dealing with theoretical issues of no consequence to the practicalities of every day teaching. As Shulman has remarked, practitioners tend to be more often "missing in action" than "lost in thought" (Shulman 1987, cited in van Lier 1996).

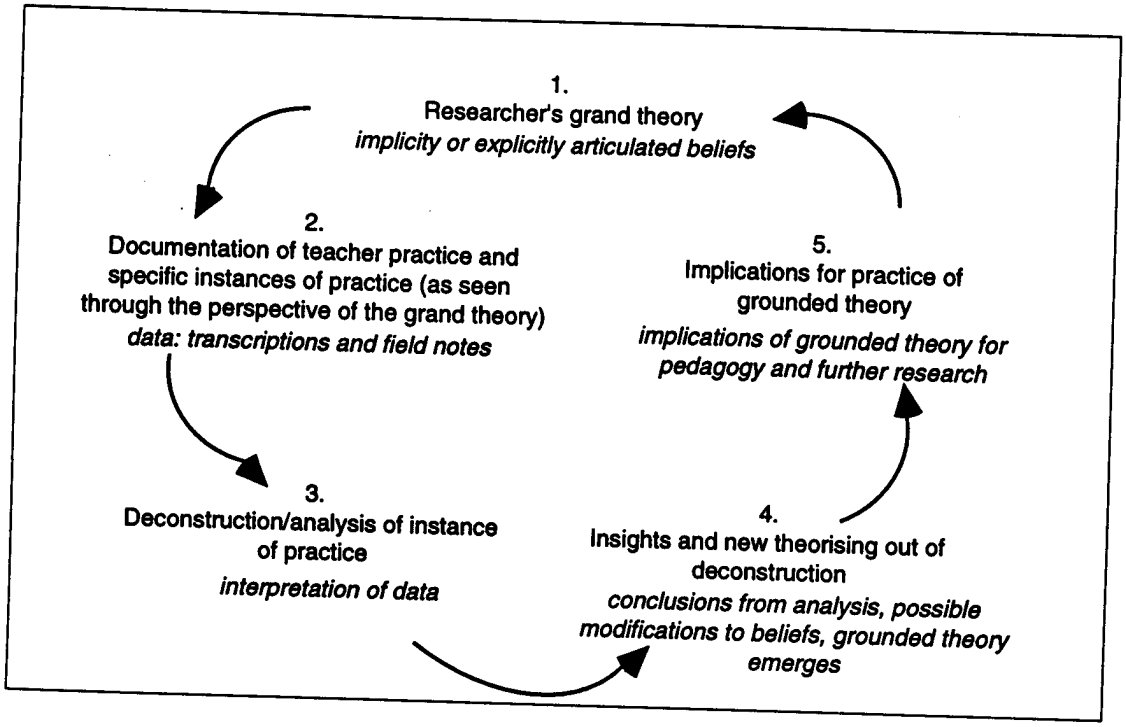
There is however a third alternative to the researcher-teacher relationship, and this alternative is bound up with a view of theory construction which has praxis as its focus and which does not "set up a pecking order between practice-less theory and theory-less practice" (van Lier 1994, p. 337). This can be described as "a new type of theory ... multidisciplinary, grounded in practice yet sophisticated as theory and directed to informing the key policy issues of our time" (British Association of Applied Linguistics, 1993: newsletter). In the field of L2 teaching, a number of researchers and scholars have argued for experience-based theory building (Prabhu 1990; Richards 1990; Widdowson 1990b; Clarke 1994; van Lier 1988, 1994; Kumaradivelu 1994; Block 1996). Rather than viewing the practice of teaching as simply *informed by* research, their arguments are based on the notion that pedagogy is *itself* a domain of theory and research. As Widdowson writes, language teachers are often represented as "consumers of findings that are retailed by research ... which denies the nature of teaching as a domain of theory and research in its own right" (Widdowson 1990b, p. 47).

Clarke (1994, 1995) argues that because theorists are rarely teachers themselves, the theory-practice distinction creates "strata of expertise in which, paradoxically, teachers are considered less expert than theorists", and suggests that "it stretches credulity to assert than the best theory building comes from individuals who are disconnected from daily contact with the schools" (1995, p. 13). As pointed out in Chapter 2, there is no coherent theory of second language teaching and learning which summarises what is known about language teaching: "over the course of its history the second language teaching field has either been without a theory or it has had its theoretical needs inappropriately met by relying on related disciplines outside itself, most notably linguistics and psychology" (Larsen-Freeman 1990, p. 261). Consequently research which deals with the nature of second language teaching per se is rare (Richards 1987). Similarly, research in language acquisition itself has generally contributed only a narrow range of insights to language teachers, largely because the methodological approaches taken have tended to exclude the classroom as research site. Clarke concludes that "the discourse [about teaching] will be of little use at best, and disabling, at worst, if the total experience of language learners and teachers is not included in the theory-building effort" (Clarke 1995 p. 16). Rather than attempting to excise teaching from its context, then, the in-context experience of teachers should be seen as essential for the development and application of pedagogical theories.

In arguing for the breaking down of the traditional barriers between theory and practice, van Lier (1994) challenges the notion that theory is something that is "constructed and subsequently applied to practice", defining it instead as a "reflexive dimension of practice", with practical activities being seen as a rich source of theoretically relevant data. Putting forward the case for classroom-based research, van Lier (1988, 1994), urges linguists to "put their energies into the service of real life concerns, and not just to pursue the Snark of academic respectability" (1994, p. 336). He suggests that action research and classroom ethnography could be "profitably combined" and that "the ever present danger of the widening gap ... between research and practice can only be avoided if the concerns of teachers and learners themselves are kept on centre stage" (van Lier 1988, p.15). This study is situated at the theory-praxis nexus. Such research involves "participation in the practical affairs of the field" out of which theory can be developed, and subsequently "put back into the service of progress in practical affairs, and so on, in cyclical reflexive ways" (van Lier 1994, p. 338).

Figure 3.1 suggests the role of theory in this model of the research process.

Fig 3.1: Research as a process of exploration



In the diagram, Step 1 acknowledges the subjectivity of what the researcher 'sees', and puts the researcher's view of the world 'up front'. The theory and assumptions that inform this study have been made explicit in the previous chapter, *Connections across discourses: building a theory of practice* and will be further developed in the current chapter.

Step 2 represents the data gathering, (although again it is important to note that how it is documented and interpreted is embedded in the assumptions and beliefs of the researcher, for example, assumptions about what language is, what classrooms are for, and what counts as learning).

In Step 3 instances of practice are analysed and interpreted, in this study to show, for example, how student learning has occurred or how language development evolves from interaction.

From these interpretations emerge certain propositions, for example, in this study, the role of prior and shared experience in developing intersubjectivity and in making new language comprehensible. Such findings are articulated and form the 'grounded theory' that is a significant part of ethnographic and interpretive research. This is represented by Step 4.

Finally, at Step 5, these grounded theories can be reapplied both to practice and to theory building. The grounded theory developed through the process contributes to a theoretical model for subsequent studies.

The arrow from Step 5 back to Step 1 indicates the cyclical and reflexive nature of much qualitative research. New insights continue to impact on the further development of the process, while theory continually shapes and reshapes the whole of the research process: it is not confined to initial framing of questions or to final data analysis. The cyclical nature of the research may result in some changes of direction and additional theoretical perspectives. As this study evolved, for example, it became clear that a number of 'fields' were present in the discourse (see Part 4 for discussion of the notion of field), the significance of which had not been anticipated. In addition it was found that interactional patterns could differ in minor ways which had subtle but important effects on the discourse. These perspectives proved worthy of further investigation. Thus the design of interpretive qualitative research is constantly evolving and emergent rather than preordained. Hammersley and Atkinson (1983) explain the dialectical link between theory building and data collection in this way:

> In ethnography the process is reflexive. In ethnography the analysis of the data is not a distinct stage of the research. It begins in the pre-field work phrase, in the formulation and clarification of research problems, and continues into the writing up. Formally it starts to take shape in analytic notes and memoranda; informally it is embodied in the ethnographer's ideas, hunches, and emergent concepts. In this way the analysis of data feeds into the process of research design. This is the core idea of 'grounded theorising' ... the collection of data is guided strategically by the developing theory.
> (Hammersley and Atkinson 1983, p. 174)

Given the kind of teacher-researcher relationship implied in this discussion, then one issue that must be addressed is what Labov refers to as the 'observer-paradox' (Labov 1972, p. 209). This is a recognition of the influence of the presence of the researcher on the data being collected. In the classroom context, for example, an observer in the language classroom may affect the behaviours of both the learners and the teacher. At worst they may find it somewhat threatening, and may say or do things that would not have occurred in the usual course of events, viewing the researcher as "a sinister figure in the wings, faintly contemptuous, armed with the

paraphernalia of expertise and tapping ominously their research findings" (Rosen 1978, p. 55).

The observer-paradox becomes particularly problematic where the research attempts to separate the researcher from the data. Both empirical and naturalistic methods of research have attempted to do this, though in different ways (Hammersley and Atkinson 1983). Empirical methods may attempt to eliminate the effects of the researcher through standardisation of research procedures, while naturalism may suggest the researcher should be a neutral vessel for the documentation of 'experience'. While some have claimed that quantitative research is less subjective, the structuring of the data may have reactive effects: people react to the structure, thus increasing the chances that the behaviour studied is an artefact of the research process itself (Hammersley 1994). Both positions fail to recognise that all data involve theoretical assumptions: the researcher cannot be separated from the data. A classroom study such as this, represents, in one sense, not simply a 'perceptual' narrative of the classroom but a 'conceptual' one. The researcher is not so much an eye-witness of the classroom, but rather the creator of its story (Brodkey 1987). The key issue, then, within the paradigm of this study, is not that the effects of the researcher should be eliminated, but that they should be acknowledged. Hammersley and Atkinson suggest "including our own role within the research focus and systematically exploiting our participation of the world under study as researchers" (Hammersley and Atkinson 1983, p. 25).

If the researcher is held accountable for uncovering their world view, to make explicit the grand theories that construct the framework of the research, and if the role of the researcher is built into the research design, then the issue of the observer-paradox is a less pressing one. In this study I attempt to do these two things in two ways: first, by describing my role within the classroom so that any influence I had on curriculum decisions is not hidden (see the section on data collection); and second, by making theoretical assumptions and ideological positions as explicit as possible, both in the writing of the research, and in talking with the participants[3]. It is useful at this point to give a more concrete example from the study of how the effect of the researcher can be acknowledged and built into the research design.

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3 The second is essential for some forms of research, for example, in some forms of action research in the classroom, and in research aimed at 'empowerment' (Rampton 1992), where participants' assumptions and positions then become part of what is on the table for discussion.

Much of the data collected was on audio tape. Tapes made in authentic classrooms, as anyone who has been involved can testify, are at times notoriously difficult to understand, even to hear. I was interested in the interactions of children as they were working in small groups, so a considerable amount of taping was in this context. In general the students' interactive and interpersonal skills when they talked together were impressive, but at times, and as might be expected, there was a considerable amount of overlapping of turns, attempts to make a point by talking louder than anybody else, and a high level of background noise from other working groups. The children were very keen to hear the tapes, but on one occasion when they listened to them they commented with some disappointment that "you can't hear what we're saying". What follows is a summary of the conversation that took place between the children and the teacher.

Teacher:	Why can't you hear what you're saying?
Children:	Because we're all talking at once.
Teacher:	And what happens if you all talk at once?
Children:	Mrs Gibbons can't hear what we're saying so the tape won't be any good.
Teacher:	Well yes, but why else isn't it a good idea?
Children:	We can't hear what other people are saying?
Teacher:	And why isn't that a good idea?
Children:	It's rude to people.
Teacher:	And why else?
Children:	Because if we can't hear we won't hear other people's ideas.
Teacher:	And so?
Children:	We don't learn so much.
Teacher:	So what must we remember to do when we're talking in groups .. not just for the tape recorder but always.
Children	*giving suggestions*: 'take turns', 'listen to each other' , 'not shout' 'don't all talk at once'.

From then on with this class, turning on the tape recorder usually became a signal for model group behaviour. Though it would be fair to point out that interpersonal group skills was something the teacher and children worked at in an ongoing way, the incident with the tape recorder illustrated to the children in a tangible way the importance of listening to each other and the need for collaboration. From this interchange which involved my data, the teacher and themselves, the children learned some important lessons about how to work together successfully. But at the same time it suggested that the explicit teaching and learning of collaborative skills

is a prerequisite for the kind of small group work which many SLA researchers see as facilitative of language learning, and that the development of these skills needs to be taken into account in classrooms where language development is a key focus.

It is hard to see here where the research process ended or began, and becomes impossible to separate out the process of data gathering, its effect on the participants, and the reaction to it from children and teacher. From the research process itself grew new learning for the children which was in turn a new source of data for the researcher. It is an example of the complexity of the observer-paradox, but at the same time, it is an example of the importance of acknowledging it and sometimes exploiting it for its usefulness to both researcher and researched. Such instances suggest a notion of 'research as curriculum', and exemplify the reflexive and open-ended nature of this kind of research.

The model of research presented here also relates closely to part of the rationale for much educational research, this study included: that its findings should offer useful insights for professional development and curriculum design. I have argued that ethnographic and interpretive research is able to articulate teachers' innate and intuitive understandings about teaching and learning, and that the importance of particular instances of practice is that they may be a source for new theorising. Such studies then are not simply a description of useful teaching strategies; it is important to draw a distinction between pedagogy and practice. There is a danger, and one that seems to be ever present in the current educational context, of pedagogy and teaching strategies being treated synonymously, with instances of practice *becoming* theory. Some of the teacher development materials around 'process writing', for example, reduced the potential richness of whole language theory to a series of procedural steps through which teachers and children should proceed. It is easy to see how this could then become the 'theory' of process writing, rather than simply a useful example of a way that pedagogical theory might be operationalised. It is probably fair to say that teachers are told what they should be doing and how they should do it, rather more often than they take part in discussion and critique of current pedagogical theories which build on the wealth of their own expertise, and out of which teachers themselves can generate a range of practices. This confusion between pedagogy and practice is not only profoundly disempowering for teachers; it is ultimately reductionist in its effect on teaching and learning, leading ultimately to theoretical reduction. In contrast, Kumaravadivelu (1994) describes what he refers to as the "post-method" condition, which he defines as "a search for an open-ended, coherent framework based on current theoretical, empirical, and pedagogical insights that will enable teachers to theorise from

practice and practice what they theorise" (1994, p. 27). This framework "signifies a search for an alternative to method rather than an alternative method" (1994, p. 29). As Clarke also argues, "we will have a much better success in understanding language instruction if we assume that teachers' decisions and behavior meet some criteria of rationality, what Prabhu (1990) calls a sense of plausibility, than if we attempt to fit observed behavior into a preconceived theoretical mould where linguistic or other criteria predominate" (Clarke 1994, p. 17).

Rather than presenting particular strategies as the 'way' to teach, then, it would seem to be more strengthening of the professional growth of educators, and more potentially transforming of classroom practice, to consider what can be learned from instances of teaching, and then to consider how this learning can be operationalised in further ways. Such collaboration can also extend the research agenda in ways which foreground teachers' own professional concerns.

Some ethical considerations

In working with the teachers in this study, three principles became important, in addition to those generally accepted as requirements in classroom research[4]. These three ethical considerations are in line with the requirement in qualitative research to protect participants from risk or harm, and with the notion of exchange of services or reciprocity (Agar 1980; Erickson 1986; Davis 1995).

The first principle is that research should take second place to children's learning. Since I was not relying on controlled experiments, or on researcher-written material, it was not difficult to avoid disruption to normal teaching routines, and the teachers followed their normal planned program. Any disruptions were in fact in reverse: the research got disrupted even if the teaching did not. In the course of the research, I experienced two fire drills, the noise (at times deafening) of rebuilding the classroom next door, the usual stream of visitors to the classroom, announcements over the tannoy system, children leaving mid-recording to visit specialist teachers, sudden changes of teaching plan, the swimming program, and Christmas concert practices.

A second principle was to avoid adding to teachers' work loads. Ideally more time would have been spent interviewing teachers, discussing interpretations, and

[4] For example, the anonymity of participants, their informed consent and their right to withdraw from the study, and researcher sensitivity towards issues relating to the exposing of professional practice to scrutiny.

gaining their insights on why they had chosen certain courses of action. I was conscious however that time they gave me was personal time, often at the end of a long teaching day which in addition had been followed by meetings with specialist teachers to plan and refine programs. This is an example of one of the compromises researchers must be prepared to make if they work in authentic sites: to remain aware that the research agenda is likely to be far less important, and certainly less immediate, to teachers than it is to researchers. Despite considerable school pressures the teachers regularly provided me with copies of their programs, talked through with me what they planned to do, reflected on the course of events in a class, made photocopies of children's work, and provided me with copies of any documentation they saw as relevant.

The third principle was that of reciprocity. Major insights that came from the research were shared with the teachers and the school, through a series of professional development activities for the whole staff. Discussions with the two teachers involved in the study frequently indicated that they felt their practice was affirmed. On being shown the positive effects on writing of her talk with an ESL student, for example, one teacher commented: "I didn't realise I was doing that. I suppose you do it without thinking". Comments like this were not uncommon, and lend support to Heap's claim that the value of *a priori* claims is in unfolding educational concepts and putting teachers' intuitive understandings into propositional form (Heap 1995). Returning to the same school a year after I had first collected data there, I discovered that the particular practice on which I had focused and consequently talked to teachers about (which in the research I refer to as 'teacher-guided reporting') had been built into several teachers' programs as a regular event across the curriculum. Such is the power of telling teachers what they already 'know'.

The model of research as I have outlined it so far has implications for data collection and interpretation, and these issues are discussed in the following section.

Implications for data collection and interpretation

The goal of theorising practice, the reflexive approach to research that I have suggested, and the closer involvement of teachers in the research process, all impact on the choice of research site. It would seem to be self evident that the choice for a research site which is concerned with pedagogy is the place where pedagogy is put into practice, namely, the classroom. Yet, as has already been suggested, this has

not been the case in SLA research (Nunan 1991), leading Nunan to argue that we need "far more of these classroom-based, rather than classroom-oriented studies ... [and] research which investigates linguistic behaviour in context" (Nunan 1991, p. 9).

In producing empirical claims, issues arise such as generalisability, sampling, validity and reliability. If empirical claims are seen as the *only* type of claims that are relevant or possible, then all research, including that which is actually non-empiricist, has to take these issues into account (Heap 1995). Researchers must then demonstrate that they assure the 'validity' and 'reliability' of claims, in order to be able to make warranted 'generalisations' and to be seen as 'doing science'. Criticisms levelled against ethnographic research include lack of precision because of the lack of quantification; subjectivity and hence bias in the data; small samples which are not generalisable; a lack of statistical control of variables and hence the impossibility of identifying causal relationships; and the impossibility of replication (Hammersley 1994). Heap (1995) argues that this line of rhetoric is misguided and that by orienting to empiricist criteria, researchers risk distorting their research: they are "dancing to the tune of the empiricist piper". Arguing that non-empiricist research should not try to justify itself as science by using an empiricist methodology, Heap asserts that instead it should look for other ways of formulating methodology, in line with its own aims; it should "dance to a different tune ... in line with the dance we want to do" (Heap 1995, p. 275).

In line with their own aims, then, ethnographic researchers might respond to the criticisms above as follows (Hammersley 1994). In response to the first, precision may not be important; where differences are large they can be reported in less precise ways without loss, and additionally, precise measures may not be justified given the nature of the data available. Second, all research is influenced by the researcher's assumptions, even if these are not made explicit, thus all research is to this extent, subjective. Structured data may even increase the chances of atypical behaviour which is not representative of the phenomenon under scrutiny. Third, the choice of small samples represents a choice of depth of investigation rather than breadth, and this may be more appropriate for the purposes of the investigation. In addition, ethnography is usually not concerned with empirical generalisation but with theoretical inferences, which do not require the case studied to be 'representative'. The grounded theory established by interpretive qualitative studies potentially allows for transfer (rather than generalisability) to a wide range of cultures and situations, given contextual similarity between the described situation and the situation of the study to which the theory is to be transferred (Davis 1995).

Fourth, causal relationships in the social world are not of the same kind as in the physical world; in fact the tracing of patterns of relationships among social phenomena which is possible within an ethnographic approach, is not possible through experimental techniques. Finally, replication is not the only means by which research can be evaluated (Hammersley 1994).

There are three further considerations which should guide the data collection and analysis of interpretive research. First, given its holistic and emic nature, it is important that the construction of meaning is considered "at least one level up from the actual social situation being investigated" (Davis 1995 p. 444). In this study, this contextualisation is achieved in two ways, first by including an account of the school, the teachers and the overall programs (this chapter), and second by providing two Episode Summaries[5] which summarise the corpus as a whole, and represent a detailed account of every teaching and learning activity in the two classrooms (see Appendix 1). These summaries illustrate the representativeness of the texts chosen for detailed interpretation.

Second, research credibility must be established. The findings of qualitative research must be shown to be credible to those being researched, and to other researchers. One way that this can be done is to triangulate by drawing on multiple sources and methods for analysis. This study draws primarily on audio-recordings of teacher-student and student-student talk, but also on field notes, interviews with children and teachers, and written work from the students. In addition, assertions about patterns of behaviour must be backed up by evidence in the form of "thick" description, detailed and drawing on several sources (Geertz 1973). The episode summaries (see Appendix 1), the teachers' written program, the field notes, and the description of the classrooms in this chapter all aim to provide a thicker description than would be possible simply through a linguistic analysis of the transcripts alone.

Finally, the question of which sections of discourse to select for close analysis is a critical issue. Given that discourse analysis by its nature is concerned with large chunks of text and that such classroom studies often yield large amounts of data (this study for instance includes fourteen hours of transcribed discourse), then the choice of what sections to describe in detail is complex. Concerns with sampling, which deals with phenomena on a large scale, are clearly important if the purpose

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5 An episode is roughly equivalent to a single teaching/learning activity. The term is discussed further in Chapter 4.

of research is to produce justifiable empirical generalisations, but in qualitative research the issue is not about sampling, but about selecting the most appropriate examples in order to exemplify as adequately as possible the basis for any claims being made.

> Data for cultural science inquiry, must be chosen and analysed *for what they can be used to exemplify*...the task of the analyst is to produce a culturally warranted description of the captured events as the basis for generating claims about the normative organisation of the activities that the data are taken to exemplify ... The question that must be asked is whether the data collected and examined exemplify adequately the type of activity the analyst claims he or she is analysing.
> (Heap 1995, p. 286, my italics)

The selected texts thus aim to 'tell a story', and are chosen for their potential to illuminate for the reader a particular aspect of teaching and learning. In order to understand the data in this way the researcher, as ethnographer, becomes a participant in the culture that the data exemplifies, and it is this relation to the data that allows the researcher to decide that a claim is intelligible and adequate (Heap 1995). To assist in this, the researcher also brings to the task whatever insights and experience and familiarity with the situation that has accumulated over time. Van Lier suggests this is of crucial importance: "this knowledge constitutes the base line, a sense of common ground between observer and setting, which underlies efficient descriptive and analytical work" (van Lier 1988, p. 5).

Inevitably what must then be addressed are questions about adequacy of data and accuracy of judgements. A clear requirement in a test of validity, or, to use a more suitable term, credibility, is that fellow cultural members must concur in the claims made:

> other analysts who claim cultural membership must concur that the proffered generalisation, and the descriptions on which it is based, represent a culturally possible world.
> (Heap 1995, p. 287)

This is not a 'soft' alternative to an empirical approach: indeed the requirement in ethnographic research that the researcher be held accountable to the community and the data set is equally as rigorous as empirical and experimental approaches where, however elegant and scientifically 'sound' the research design, the researcher's claims ultimately draw from their interpretation of the data alone, and are likely to

be held up for serious scrutiny only by other researchers. The researcher is effectively hidden from view (Stenhouse 1982). Stenhouse addresses the issues of 'standards' in what he refers to as 'illuminative research' and argues for the judgment of the researcher to be consistent with that of the participants, but draws on the tradition of the historian for an example of how such practice might be validated:

> While science tends — logically at least — to rest on the replication of experiments, history rests on the replication of judgments of the same data, the possibility of persuading the reader who knows the sources of the cogency of the interpretation.
> (Stenhouse 1982, p. 5)

The research should therefore seek to make this judgment possible for an audience, and be held accountable for the data and its interpretation. This requires that the researcher makes their documentary sources publicly accessible. In this study, the episode summaries are a detailed account of every teaching and learning activity and account for all the data collected. Chapter 4 discusses the major themes which emerge from this corpus. Illustrative texts selected for detailed examination in later chapters can thus be placed in the context of the discourse as a whole, and can be seen as typical, recurring and representative teaching and learning patterns. The fourteen hours of transcribed discourse is also available, although for reasons of space has not been included. However, the study contains substantial amounts of this transcribed discourse.

In summary, and to return to the comment that qualitative research must 'dance to its own tune', the equivalent parameters of quantitative and qualitative research can be compared in this way: studies must be, according to each paradigm, valid/credible; reliable/ dependable; and generalisable/transferable (Davis 1995).

PART 2: THE SCHOOL CONTEXT: COMMUNITY, TEACHERS AND CHILDREN

The school community

The study was carried out in an inner-city school in a poor working class suburb in Sydney. The school took children from Kindergarten to Year 6 and was a three-stream school, meaning that at each level there were three parallel (unstreamed)

classes. There are substantial numbers of Lebanese speakers in the suburb, although recent years have seen a steady influx of other migrants from South East Asia, China, Hong Kong and the Philippines. About 90% of children at the school are from migrant backgrounds, a mixture of first generation migrants (born overseas) and second generation (born in Australia). First generation parents within the Lebanese community tend to be from village communities, and have often had little formal schooling. Though highly supportive of education, they have not in the past always felt competent or confident to take part in the life of the school, and many traditionally hold a culturally-based view of parent and teacher roles where the school and the teachers are seen as entirely responsible for the education of the children. However, parent involvement in the school has increased considerably over the past ten years and, at the time of the research, was an important feature of the life of the school.

Around one third of the children enter kindergarten with little or no English, and of the remainder, very few approach native-like proficiency in English. As Chapter 1 pointed out, typically such children become fluent in basic playground English very quickly, but remain below the English language levels of their native speaker peers in the more academic registers of school. Most Lebanese children in the school are also unlikely to have had much exposure to standard written academic Arabic. Studies which have examined the statistical likelihood of children from different ethnic backgrounds being placed in low streams at secondary school, show that Maltese and Lebanese children are the most likely to be placed in such streams (Horvarth 1986), and so these children are considerably at risk of educational failure.

At the time of the research, the school had two specialist English as a Second Language (ESL) teachers, who withdrew some children for small intensive English classes and also provided support for children in the classroom alongside the mainstream teachers. The school also had a transitional (Arabic) bilingual program which operated in the first three years of school, with two Lebanese-Arabic speaking teachers. In general, the teaching programs of these three groups of teachers, (mainstream teachers, ESL and bilingual teachers), were closely integrated, with all teachers basing their teaching on a common curriculum in terms of the 'content' of what was taught. Thus, in the bilingual program, children followed the same (content) curriculum as the other children, but through the medium of Arabic. Similarly, in withdrawal ESL classes, language teaching was based on the curriculum content of the mainstream classes. The school also had a Special Education teacher for children designated as eligible for special support,

and a full time librarian. Many parents also helped on a regular basis in the school, hearing children read, helping children in their mother tongue, and working in teacher-aide type roles.

Despite these extra resources, the challenge to teachers in such a school is considerable. In most classes, in addition to the demands placed on them through ninety per cent of the children being non-native speakers of English, there were on average two to three children who had arrived very recently in Australia, one or two emotionally disturbed children and one child with a significant health problem. All teachers regarded themselves as ESL teachers and saw themselves as providing the major resource for children's English language development. The notion of 'language across the curriculum' was firmly entrenched in the school, and most of the teachers had received some professional development in ESL education. In addition, there was a strong professional development ethos within the school, and using some release time, and a good deal of their own time, teachers regularly met to collaboratively plan program, share problems, and discuss issues which they had identified as their own professional development needs. Largely as a result of this strong professional development focus, the school has, over a number of years, redesigned the curriculum and the language programs to better meet the needs of children from language backgrounds other than English and to make better use of the ESL specialist teachers. As a result of this ongoing professional climate, most teachers were reflective practitioners who were able to scan and select from a variety of educational theories those elements which best enabled them to meet the needs of the children in their classes. In relation to many other schools with similar student profiles, with which I am familiar as a result of earlier work as a consultant, it is my opinion that one aspect of the professional environment of the school was particularly significant: teachers held high expectations about what children could achieve if they were given appropriate kinds of support, and had very positive attitudes to the children's first language and culture.

While holistic and experiential work played an important part in the teaching programs, teaching also included explicit and focused language work. This drew on a range of perspectives. At various times a teacher might include a notional/functional focus (such as *classifying*, or *comparing*), aspects of grammar (such as the use of tenses or plurals), or the explicit teaching of genres (such as narratives, reports or discussions). Reading drew on a whole-language perspective, and within this included the teaching of phonics as part of the development of a range of reader strategies. Writing was explicitly modelled and guided. In short, the

language programs were the result of principled pragmatism, developed out of understandings of language and learner needs.

The effect of all these factors on the achievements of the children has been considerable, and during the time of the data gathering it became necessary to rewrite much of the curriculum to meet the increasing achievements in reading and writing of the students who had had the benefit of the programs and the teaching offered by the school.

The teachers

The two teachers in the study, Penny and Kath, [6] were both personally known to me. Penny (Classroom 1) had several years earlier been a school consultant for non-English speaking children who were recent arrivals to Australia. She had many years teaching experience, held a Masters degree in Applied Linguistics, and had ESL specialist training. She held an executive position in the school. Kath (Classroom 2) had been teaching in the school for nine years, and also held an executive position. She had taken part in a great deal of professional development at the school, and was familiar with the major issues in ESL education. Both teachers were familiar with the systemic model of functional linguistics which informs this study, although Penny's knowledge was much deeper as a result of her linguistics background.

I approached both teachers to take part in the study because I considered them gifted teachers, and because our already established professional and collegial relationships meant that we would be at ease in the classroom together, an important requirement in this type of research. I had also previously worked with Penny in the classroom on an earlier piece of research. Both teachers were aware that I was interested in the role of classroom discourse in second language development, and in the role of spoken language in the development of the more context-reduced registers of school. We agreed that although I would not take an active part in teaching the lessons, I would respond normally to children when they initiated interaction with me.

Both Penny and Kath not only helped to collect data, but within the context of normal activities, set up situations which might provide interesting data. For example, knowing that I was interested in children's explicit understanding of the

6 Not their proper names

processes of their own learning, Penny asked children several times during the course of the unit of work to write down what they had learned about what they were studying, and discussed with them what had helped them in their learning. The responses from the children proved to be an additional form of triangulation. Thus while responsibility for the research issues and development of methodology was mine, teachers were not merely passive informants. Their interest in working with me came out of their commitment to their students, a genuine interest in finding out possible ways to extend their own teaching skills, and ultimately to issues of social justice. They were integral to the research not simply because I was a guest in their classrooms, but because much can be learned from a scrutiny of their professional practice. Collaboration of this kind rests on researcher and teacher recognising and acknowledging the particular skills and strengths of the other, and recognising that each has knowledge which is legitimate. It is not an 'equal' relationship since what each brings is distinct, but in research of this type it must be a relationship of equality.

The children

Both classes of children were 9-10 year olds in their fifth year of school, and in both classes 90-95% of the students came from a range of language backgrounds other than English.

In Penny's classroom I did not restrict the focus to a particular group of children. In group activities the groups were usually teacher chosen, but varied from lesson to lesson. There were 31 children in the class, including two newly arrived children and two children on a special education program.

In Kath's classroom, where there were 29 children, I restricted the focus to seven children who together made up two 'science groups', that is, they worked together for all group activities. Julianne, Milad, Emily and Maroun made up one group, Gabriella, Duncan and Andre the other. With the exception of Emily and Gabriella, the teacher described the children as 'typical' second language speakers, meaning that they had fluency in day-to-day aspects of English, but were much less able to use English in the less context-embedded registers of the classroom. Emily was an extremely capable and intelligent child, whose English approached native-speaker competence, and who excelled in music and sport as well as academic subjects. Gabriella had been in Australia for only three months at the time of the study. Milad, Maroun and Andre also received extra support from the ESL teacher in a withdrawal, small group situation. All children spoke another language at home,

and Emily attended a Chinese 'Saturday' school. The groups were teacher-chosen in this instance, and remained together for the duration of the unit, although this was not always the case in this classroom.

In reality, the focus on specific children was only relevant during group work, since when the teacher was interacting with the class as a whole, I had of course no control over who responded. While the group work transcripts are therefore constant in Kath's classroom, whole-class recording includes a wide range of children. Since the aim of the study was not to focus on individual development, but to explore the nature of the discourse as a whole, this did not affect the study.

Before beginning the study both teachers explained to the children that I worked at a university and taught teachers. Since participants in research have a right to be as well-informed as possible (Erickson 1986), the children were told I was interested in finding out how children learn, especially what helps them to learn English. In an introductory session I elicited ideas from the children about how they thought I might do this; they offered a number of suggestions, including talking with them, looking at what they wrote, and listening to them talk. One child suggested a video recorder would be helpful, leading to a further suggestion to use a cassette recorder. With the exception of the video, to which unfortunately I had no access, all of these suggestions were taken up!

The teaching program

Both teachers followed a similar program for the units of work which form the basis of this study. A 'unit' of work comprises the study of a particular topic, and in these classrooms normally lasted between four and five weeks, with around three 45 minute classes per week. The unit fell within the curriculum domain of Science and Technology and was on the topic of Magnetism.

All teaching programs at the school were extremely detailed. An example of the overall plan for the unit of work and an excerpt of the teaching program is included in Appendix 2. The unit of work included a general overview under the four headings *topic, concepts and understandings, skills* (defined in functional-notional terms such as generalising, classifying, predicting etc.), and *values and attitudes*. This overview summarised the key learning expected over the unit of work as a whole. The summary was then detailed in terms of the objectives below under the headings *knowledge* and *skills*:

Knowledge
For the children to:
identify what a magnet does
recognise that different types of magnets have different strengths
understand the difference between magnetic and non-magnetic

Skills
For the children to:
brainstorm their knowledge of magnets
classify various magnetic and non-magnetic materials
make observations about polar attraction
predict the results of investigations
design and make a game using magnets
graph the results of an investigation

The program then included a detailed plan of every lesson under the five headings *objectives, learning activities, language, vocabulary, resources* and *evaluation*. In the *language* column, structures that are foregrounded in the unit have to do with generalising, questioning and predicting. In the teachers' program, a language structure or function is named, and followed by a possible instance of the language that might be expected to occur. For example:

to generalise — Magnets have ... , All magnets .... , Most metallic objects ...
to predict — I predict that ... , My prediction is ...

Although there was no evidence of the teachers in any way trying to restrict children to using these structures, this level of program detail does suggest how thoroughly they had planned for their teaching and how aware they were of the kind of language that might be associated with particular activities. The program indicates the degree to which 'content' and 'language' were integrated in the teachers' notions about what was involved in teaching a 'subject', a conclusion which is supported by many of the illustrative texts analysed in this study. This level of detail was apparent across the school in all curriculum areas.

During the course of the data collection, teachers followed the normal course of these programs, while I recorded and observed. I had little input into the planning stage, apart from minor suggestions. One planned activity, for example, was for all children, in small groups, to carry out four experiments designed to develop their understanding of magnetic attraction and repulsion, and then report back to the

whole class about what they had learned. 'Reporting back' is a not uncommon strategy in primary classrooms, and one in which I already had some interest: I saw it as a context for children to use the more context-reduced language I was interested in analysing. In this case however, the fact that *all* children had done *all* experiments reduced or removed any genuine communicative need for children to report back to the rest of the class, since in general they would simply have been telling their audience what they had already experienced for themselves. At my suggestion, each group of children did only one or two of the activities so that at the reporting back stage they had something to say which was new to most of their audience. As Chapter 7 discusses, there was then a genuine communicative need to make clear what they had found out: the students reporting back were positioned as 'primary knowers' and the rest of the class had a purpose for listening. As discussed in Chapter 2, the importance of an information gap is attested in the literature on second language learning, and this minor change of classroom management not only improved on the original teaching strategy, but probably also provided more interesting and relevant data.

The teaching program itself followed a sequence of learning activities which required increasingly more 'explicit' discourse; that is, the early tasks elicited the kind of 'here-and-now' language associated with early stages of language learning, and later tasks required language in which less and less of the situational context could be assumed by the speaker or writer. This issue is discussed fully, from a linguistic perspective, in the description of the model of language used, in Part 4 of this chapter. Briefly, the unit of work incorporated a number of three stage cycles: the students first took part in hands-on experimental work in small groups, they then reported on what they had learned in what I have termed 'teacher-guided' reporting sessions, and finally they normally completed some written work based on these discussions. This sequence meant that students were required to use language in increasingly more subject-specific and explicit ways. As later chapters will show, teacher-guided reporting sessions were also the time for the teacher to guide students away from personal recounts of what they had done in small group experiments, towards general scientific principles and a more socio-linguistically appropriate register, (an objective reflected above in the teachers' references in their teaching plan to *making generalisations*).

The underpinning of (and the major rationale for) this teaching sequence was the systemic functional view of language, and in particular the construct of a 'mode continuum', as described later in this chapter. However, later reflection on the data also suggests the relevance of taking into account the Vygotskian and constructivist

view of learning and teaching discussed in the previous chapter. A constructivist teaching sequence for the teaching of science developed by Driver and Oldham 1986) comprises four phases: orientation, elicitation, restructuring, and application and review, and these stages in general coincide with the sequence described above. From this perspective, the significance for students' learning of science of the teacher-guided reporting sessions is that, as Driver points out, understandings and explanations do not necessarily spring clearly from children's data alone:

> If we wish children to develop an understanding of the conventional concepts and principles of science, more is required than simply providing practical experiences. The theoretical models and scientific conventions will not be 'discovered' by children through their practical work. They need to be presented. *Guidance is then needed to help children assimilate their practical experiences into what is possibly a new way of thinking about them.*
> (Driver 1994, p. 47, my italics)

In its overall organisation, the unit of work also resembles Wells' (1995) description of the 'inquiry-oriented curriculum' which follows the steps of launching the theme; research, (often including observation and experimentation and based on empirical data); interpretation, which Wells describes as 'making sense' of the evidence; presentation, (ideally made to an audience not already informed about the topic); and reflection, both on the content and the processes involved in the course of the enquiry.

More broadly, the teaching activities that comprised the unit of work followed the sequence suggested by Mohan: of less to more explicit discourse, of practical to theoretical learning and from experiential to expository learning (Mohan 1986).

PART 3: DATA SOURCES AND ANALYSIS

Data sources

The data were collected in two classrooms over the course of the unit of work discussed above. They were not collected simultaneously, which would have been logistically difficult since the programs usually ran in tandem in each of the parallel classes. As a result the two sets of data were collected a year apart, in each case in

the final term of the year, first in Penny's class and then in Kath's. This in fact proved to have a number of advantages. First it allowed for data gathering techniques to be refined, for example, in techniques for taking field notes. It also allowed for research themes emerging from the first set of data to be reexamined using the second set, and thus for the reflexive and emergent nature of this type of research to be taken into account. Finally, it allowed for any gaps in the sources of data to be addressed. I found, for example, that even brief notes on blackboard work proved to be very useful, and so noted blackboard work more fully in the collection of the second set of data.

In both classrooms I collected data during one complete unit of work or topic, numbering between seven and eleven lessons of approximately forty-five to fifty minutes. (The rationale for basing the research on the development of the whole topic in each class, rather than on selected lessons, is discussed later in this chapter in the section on analysis.) A range of data sources were used, because I wished to gain as complete a picture of the classrooms as possible, although as is clear from the discussion that follows, no data set, however rich, comes near to capturing what has occurred. A thick data set simply makes it easier to reconstruct something of what occurred, and a range of data types provides for some triangulation in interpretation. Figure 3.2 is a summary of the sources of data. Unfortunately Penny became ill about two thirds of the way through the unit, and so the data are less complete in that classroom.

Fig 3.2 Sources of data

	Classroom 1 **9-10 year olds**	**Classroom 3** **9-10 year olds**
Number of visits	Seven visits	Eleven visits
Audio-tapes of oral interactions (transcribed)	300 mins	500 mins
Language on display and environmental print around the classroom	Some record in field notes	Detailed record in field notes
Field notes	Unstructured comments	Using framework
Student writing	Twenty-nine pieces (one piece from each student).	Forty pieces (taken over the course of unit, from focus children).
Interviews with children	Information gained through whole class discussion with teacher.	Group of seven children with me.
Interviews with teacher	During process and after, informal.	During process and after, informal.

A cassette tape recorder with flat microphone was used for recording. All teacher to whole class interactions were recorded, and selected groups of children were recorded in small group or pair interactions. It was helpful to give children time to get accustomed to being recorded before attempting to collect data.

One of the difficulties of recording in genuine classrooms (as opposed to a group of students in a laboratory type setting brought together solely for the purpose of research) is the almost inevitable background noise, which can make it difficult or impossible to decipher tapes. In Kath's classroom this was made especially difficult because of the school's building program. However, the inevitability of undecipherable gaps was outweighed by the authenticity of the data, and in research which is concerned with praxis it is probably one of the compromises that researchers have to make. As van Lier comments:

> I have found, while working in extremely noisy conditions, with large classes and very vocal children, that no more than partial transcriptions even in those circumstances could reveal classroom and interaction patterns that observation checklists, interviews and training programmes could not. Especially, such analysis, even though it may not be possible to transcribe everything that everybody says for every instant of the lesson, allows us to describe what the learners actually and actively do during the lesson, as individuals and as groups.
> (Van Lier 1988, p. 64)

Even when it was possible, it was not necessarily useful to rank obtaining a good recording ahead of this authenticity. On one occasion the classroom was particularly noisy because an extra ten children were in the room. The class were doing a dictogloss, which involves students in groups discussing and reconstructing a text, on the basis of key words and very brief notes which they have earlier noted down individually while the teacher is reading a text aloud at normal speed. As there was an empty classroom next door I took out one group of four children. I was unprepared, however, for the effect on the children of being in an empty silent classroom with a cassette recorder. The recorder, which they had always previously ignored, now became a focus. The discussion which is integral to a dictogloss did not eventuate. Instead children *showed* each other their notes, gestured silently, occasionally whispered and only spoke aloud, one at a time, when they had completed their text, which they then read aloud into the tape recorder. Clearly

they saw this as some kind of 'performance' and were not prepared to allow the process itself to be recorded.

Even a good recording is no more than a partial record of what has occurred. It does not show the extra-linguistic information which is part of the resources for meaning making: facial expressions, gestures, and glances. Neither does a recorder capture what I often saw or felt — the sense of urgency of a child wanting to answer a teacher's question, the frustration of a child who could not find the words in English to express what they wanted to say, or a shy student's inability to break into a conversation. While field notes help to fill out the context of talk, no data can adequately capture the reality of the class as it is lived by the participants.

Issues in transcription

What is perhaps more problematic than collecting the data is the question of how it is transcribed. Again we return to the impossibility of separating researcher from data. Transcribing involves conscious choices on the part of the transcriber, choices about what and how much to transcribe, what to leave out, and how to represent the relationship between speech and the written word. As Ochs (1979) points out, mechanical recording does not eliminate problems of selective observation, it merely delays them. Ultimately, the choices made relate to the purpose of the transcription: a narrow phonetic description is essential for defining the phonemes of a language, but probably not in a study concerned with the interactive nature of discourse. Equally, choices will be influenced by the transcriber's theory of language and, in a classroom context, what they count as important in learning. As Ochs comments, transcription is a "selective process reflecting theoretical goals and definitions" (Ochs 1979, p. 44).

In the selected texts I have opted in most cases to use participant columns rather than to present the transcript as a linear 'script'. This was a deliberate choice in order to maintain a focus on the interactive nature of discourse, and the ways that teachers and students construct knowledge together. Pulling apart the turns, but at the same time presenting them as visually contingent, makes is possible to focus on both individual verbal behaviour and interactive behaviour. For example, by reading vertically down one column, it is possible to track students' developing field knowledge through their changing verbal behaviour, or to focus on the number and types of contributions of either students or teacher. But it is also possible, by reading across the columns, to see the process by which dialogue is achieved, for

example by analysing the semantic relationship and discourse coherence between speakers. Ochs, writing of this convention in relation to younger children, suggests:

> Contingency across speaker turns is not promoted by the transcript. The assessment of pragmatic and semantic links becomes a more self-conscious process ... the reader can see more easily the prior verbal behavior of the child. In interpreting an utterance of a child, the reader of the transcript can assess its place with respect to what the child has been saying or doing as well as with respect to the talk or behavior of the co-speaker.
> (Ochs 1979, p. 48)

Leftness in English script tends to be associated with control or prominence, and so we might tend to 'read' the speaker on the left as the dominant or initiating speaker. Since this study foregrounds learners' increasing control of language, and the role of teachers in a constructivist and Vygotskian notion of pedagogy, it did not seem appropriate to place the teacher on the left: this might have suggested a different kind of teacher role from that suggested by the study. Choice of layout has therefore evolved out of a theoretical frame of reference, and this process of coming to decisions about how to transcribe constitutes part of the ongoing analysis itself. The layout of data also throws up insights, hence itself *develops* theory. The following example exemplifies this point.

The layout of the transcription in Figure 3.3 came about because initial reflection on the data suggested that the teacher talk encapsulated more than one field. The discourse was not only about science, but also about language. To show this more clearly the two fields have been pulled apart, and this is represented through the transcription. In terms of insights about language learning, this example indicates how talk about language can occur in the context of actual language use. In terms of methodological issues, it shows how register theory[7] (Halliday and Hasan 1985) has influenced the way in which the transcription is made and how the original data are 'heard'.

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7 Part 4 of this chapter describes the model of language referred to here.

Fig 3.3 Two fields

In this example teacher nominations are italicised to indicate they stand outside both fields. The rephrasings of the notion of generalisation (*general ideas, something that will happen all the time, not something that just happened today*) are included in the 'language' column since they represent an attempt by the teacher to define or give an instance of the metalanguage she is teaching the children.

Students	Teacher: Field- talk about language	Teacher: Field - talk about magnets
		let's try this what if I try the north pole and the south pole .. of the magnet .. who can tell ..
	I want a sentence a nice sentence *Carol Ann*?	
C: the north pole and the south pole attract		
		good ... what if I try the south pole of this magnet and the north pole of that magnet .. *yes Francois*
	come on a sentence	
F: the south pole and the north pole will attract		
		good boy good Francois alright and let's try the south pole of this magnet and the south pole of the other magnet ... *Stephanie*
S: the south pole and the south pole will re .. repel		
	good (*to observer*) my goodness aren't they speaking well/so I would like two ideas that we get from this . . two 'general ideas . . . what we call 'generali'sations ... who can give me something that will happen 'all the time . not what just happened to us today	
		Gina do you want to try
G: if you put the north pole and the north pole together em that will not .... that will repel and if you put the south pole and the south pole together that will repel too		

Decisions must also be made about how much information to include. A guiding principle is to include whatever features are necessary for the researcher's purpose (Halliday 1985a) and to suit the depth of detail to the kind and depth of analysis intended (Edwards and Westgate 1994). It is also important that the data is

comprehensible to the reader, which may not be the case in a very narrow and detailed transcription (see for example, Sachs, Schegloff and Jefferson 1974, where intakes of breath, increased volume, and stress are included). Among the transcription conventions significant in this study is the marking of pauses (see below). It has been suggested that a major feature of classroom discourse is its very fast pace (Edwards and Westgate 1994), whereas a teacher's tolerance of hesitations, and a longer 'wait time' for a student's response have been seen as a marker of more open and reflective learning (Rowe 1986; Dillon 1988; Cazden 1988). Initial reflection on the recordings indicated that extended wait time was a feature of both classrooms. Consequently these pauses have been marked.

No attempt has been made to indicate pronunciation, stress and intonation, except as indicated below. At times this becomes problematic, since often children and teacher use very informal speech such as *yeah,* or *gonna,* rather than standard pronunciation. However the choice has been made to avoid transcribing such features on the basis that other pronunciation features have not been transcribed, and that there is a danger that such conventions risk representing stereotypes of certain students on the basis of features such as class or dialect, while not differentiating others.

Fig. 3.4 shows the notational conventions used in the transcription.

Fig 3.4 Transcription conventions

(.) Represents a perceptible pause of less than one second.

(..) Represents a pause of approximately two seconds. Following this convention, each additional (.) represents an additional second.

/ Represents the end of a 'meaning' or 'sense' unit, and the start of another, often but not always corresponding to clause boundaries. Its sole function is to facilitate the reading of the transcription where there is no other indication (such as a pause or a question mark), which would indicate the boundaries of the unit meaning eg.

we predicted/ we predicted how many . paper clips we thought would make a chain/ what do you think I was . trying to find out/ why would I do an experiment like that . Fabiola?

' Used immediately before a syllable to indicate unusually marked stress or extra emphasis eg.

we say magnets . re'pel (*said with great emphasis*).

= Indicates an utterance from one speaker which continues after interruption eg.

S1: and then we put the magnet in it =

S2: and then we got

S1: = and then we got another magnet

*** Indicates unclear speech. Each (*) represents approximately one syllable.

___ Underlining denotes simultaneous speech from two or more speakers eg.

	STUDENT	TEACHER
1		can you tell me about this? (*holding a pin*)
2	G: the pin	the magnet
3	G: the magnet attracts pins	
4		and this (*holding a cork*)
5	B: the magnet doesn't	
6	F: it doesn't attract the cork	

Names of students are usually indicated by their initial. Where it is unclear who is speaking, this is indicated by numbering speakers with S1, S2, S3 etc.

Each turn is numbered, as in the short transcript above.

Since a transcription represents spoken language, sentence conventions have not been used, however question marks have been included to indicate to the reader how to interpret particular utterances. Some commentary has been included, as needed, to give details necessary for understanding the transcript, or to give a fuller representation of the situational context. This is indicated in italics eg.

it goes here (*indicating position on the blackboard graph*)

Field notes

Field notes in the first classroom visited were made informally, and referred to any aspects of classroom events which appeared significant or would later help to interpret the transcripts. Although these notes proved helpful, the lack of structure meant that at times some useful information was omitted. Consequently in the second classroom, field notes were made using a simple framework with the headings: *Activity, Discourse pattern and time; Description of activity; Language on*

display (eg. on the blackboard or on butcher's paper), and *Comments*. Figure 3.5 is an example of the types of notes taken:

Fig 3.5 Example of Field Notes

Activity, participant structure and time	Description of activity	Language on display	Comments
recapping of last class, teacher to whole class, 8 mins.	teacher-led discussion, chn. seated on floor	written on board before activity began: *we found out that...*	chn. v. attentive. Mario v. keen to explain what he did. Note — teacher questions led to chn. making generalisations

Though this is a simple framework it was found to be valuable in documenting the major features of each episode and in providing situational information to accompany the transcripts. It also helped to substantiate insights gained from the analysis.

The approach to analysis

One of the challenges in classroom research is to find ways of handling the large amounts of data usually yielded. One way to document what goes on in classrooms is to make use of an observation scheme, the purpose of which is to allow an observer to record systematically what they observe to be happening in the classroom, often by recording against predetermined categories defined by the researcher: see for example, the Flanders Interactional Analysis Categories Scheme (Flanders 1970); the ORACLE survey of sixty British classrooms (Galton, Simon and Croll 1980); and the Communicative Orientation to Language Teaching (Frohlich, Spada and Allen 1985). While the very early frameworks used in classrooms were relatively simple and unsophisticated, later studies have provided considerable insight into the frequency of particular linguistic behaviours, and have proved to be especially valuable in considering large amounts of data in broad macro educational settings. Such studies have revealed, for example, the common and pervasive three part IRF interaction discussed earlier. Among the most insightful of these schemes is that devised by Sinclair and Coulthard (1975). Their work shows how the discourse of teaching is structured through recurring patterns of turns by teacher and students. Their work broke new ground in that they explored language beyond the bounds of the sentence, and their categories (of lesson, transaction, exchange, move and act) and exchange structures, are

functionally determined. However, although their work is extremely insightful for those interested in classroom discourse, Coulthard and Sinclair are primarily linguists rather than educationists, and their work illuminates linguistic structures, using the classroom as a data site, rather than attempting to describe educational processes.

While observation schemes may be an appropriate tool for mapping general patterns of classroom behaviour, there are a number of reasons why this study does not make use of an observation scheme which relies on predetermined categories. First, given the argument for a research paradigm in which research is viewed as an emergent process of exploration and is reflexive in nature, it would clearly be inconsistent to predetermine what is significant. Second, in systematic observation, the primary coding unit tends to focus on the single speech act rather than on the interaction as contextualised dialogue: it is difficult to see how a scheme could be devised which could adequately capture the progressive and cumulative nature of discourse which is largely the focus of this study. To do this, it is necessary to go beyond the alternation of turns that were the focus of Coulthard and Sinclair's work, and beyond the flow of talk as it occurs moment-to moment. Third, it is likely that any coding scheme may miss capturing the less obvious or the 'single occurrence' which might actually be of significance. The researcher may be blinded to aspects of interaction and discourse which are not captured by the scheme, yet which may be relevant and important to the understanding of the classroom under investigation (Nunan 1992). In addition, numerical codings of frequency cannot on their own adequately reconstruct interactions, or the course of lessons, or the ways in which knowledge is progressively constructed. Finally, because the observations are often made on-the-spot, researchers are necessarily restricted in their ability to adequately interpret, even moment-to-moment, what is happening within a broader context. This broader context is both 'spatial' (*what else is going on?*) and 'temporal' (*how does this fit into what happened last lesson and what will happen in the next?*).

Two features are of particular significance in the approach to analysis taken in the study. The first has to do with one of the concerns of the study, which, as discussed earlier, has been to consider the meanings which extend beyond the single lesson, and how these are built up. The theoretical need to observe ongoing sequences of lessons has been argued by several researchers (Christie 1995; Brilliant-Mills 1993; Lin 1993; Heras 1994; Floriani 1993). In the current study, whole units rather than single lessons were chosen as the macro unit of analysis because of the nature of the research questions: I was interested in how knowledge gets constructed and how language learning occurs, and these learnings would be

difficult to identify within a single lesson. A 'lesson' is in any case a somewhat arbitrary unit; it may represent a time-frame within the school day rather than representing, from the students' perspectives, a coherent piece of learning. I also wished to examine the textual and knowledge relationships *between* lessons in order to more fully understand the roles being played by teachers and students, and the ongoing dialogue they constructed together. In addition, it has been argued that in any classroom, teacher and students will hear and produce what is said against an extensive background of accumulated meanings, which researchers are in danger of ignoring if the data are collected on single visits (Edwards and Westgate 1994). Thus

> ... if it is a main hazard in classroom observation that the meaning of utterance will often depend on past encounters which the observer has not shared, then there are good practical reasons for observing relationships [and we can add, curriculum knowledge itself] ... *being talked into existence.*
> (Edwards and Westgate 1994, p. 103, my italics and comment added)

If, as will be argued, participants in an interaction draw on prior contexts as meaning resources in their discourse, then an analysis of how knowledge is constructed needs to account for the range of contexts that have been constructed over time. Thus "the analyst, like a group member, needs to understand those past times, spaces and instances of being "with texts" that members signal, through their talk, as being socially significant to the meaning and content currently being constructed" (Floriani 1994, p. 260).

From my own experience, a further argument for data to include a sequence of lessons, is that otherwise inaccurate conclusions may be reached. Some of the science lessons observed consisted entirely of students carrying out experiments in small groups. In other lessons the teacher took a major role in initiating talk: the 'IRF' pattern was very much in evidence. Watching one or other of these lessons might lead to a conclusion that this was a 'teacher-fronted' and 'teacher-directed' classroom, or conversely that it was totally student-centred. Neither lesson *alone* would have provided a sense of what the teacher was doing or how knowledge was being progressively built up.

For all of these reasons a theoretical decision was taken to observe the classroom over a more sustained period of time. This made it possible to observe how a teacher handled all stages of learning, for example, how the topic was introduced,

if and how children's prior learning was built on, how new learning was developed through the discourse, and what evidence there was that this was taken up by the students. In brief, observing an entire unit of work, from opening to closure, allowed specific items of data to be more fully contextualised and interpreted.

As Christie argues:

> in order to demonstrate how a pedagogic discourse works, it is necessary to study quite long-sustained sequences of lessons. This is because the various practices involved in the very complex process by which students enter into shared knowledge and understandings, as well as demonstrate capacity to manipulate these things in reasonably independent ways, involve considerable time.
> (Christie 1995, p. 221)

A second feature of the analysis is that it does not reflect a single perspective; rather, as suggested by Chapter 2, the aim has been to theorise pedagogy through the blending of several perspectives, each of which illuminates different aspects of the topic. This approach also provides a kind of theoretical triangulation. The first of these perspectives, is linguistic (Chapter 5). The data are examined using a systemic functional model of language, described later in this chapter. This perspective allows for a focus on how teacher and children jointly construct meaning and how learners' contributions are recast by the teacher into more register-appropriate language. The second perspective has a more purely pedagogical orientation and examines the data from a neo-Vygotskian perspective in order to explore the role of the teacher in the discourse (Chapter 6). The third perspective examines the data in the light of insights from second language acquisition studies, in order to focus on the contexts for second language learning which are constructed by the discourse (Chapter 7). Throughout all the commentaries ongoing reference is made to the fourth perspective, the position and needs of minority second language learners. All these perspectives help illuminate the key issues for the study: the nature of the talk which occurred in the classrooms; the role of the teacher in this talk; and the kinds of contexts and opportunities for second language development which were provided as a result.

The current study draws on aspects of the work of a range of classroom researchers, all of whom, while working within different traditions, view interaction as central to the meaning-making process of the classroom and as centrally involved in social action. These include in particular studies by Edwards and

Mercer 1987; Mercer 1995; Lemke 1990a, 1990b; Christie 1995; Wells 1995, 1996; and van Lier 1988, 1996. Their work is discussed further in the following chapters in the context of my own analysis.

In relation to eclectic approaches such as this, Edwards and Westgate comment:

> [Research which reflects a single perspective] is more likely to gain from its consistency the appearance of rigour; a more eclectic approach may be more realistic where the phenomena being studied are highly complex and many-faceted.
> (Edwards and Westgate 1994, p. 59)

In relation to the SLA field, van Lier also writes that such judicious combinations "can illuminate a particular field of study much more than some canonized scientific procedure can do (van Lier 1994, p. 333). Following the points made by Edwards and Westgate, and by van Lier, it is argued here that an eclectic approach is no less principled than a single approach, provided that it is appropriate for the research task. Eclecticism does *not* imply using approaches which are incompatible within a single study, but rather, "bringing together concepts and methods which can yield complementary insights into the 'same' phenomena, or can bring into view different aspects of classroom talk and its organisation" (Edwards and Westgate 1994, p. 59). It is for the purpose of providing such complementary insights into the phenomena of second language development in the classroom, that a more cross-disciplinary approach has been taken here.

The analysis of transcribed data is dealt with at two levels. The first, the *Episode Summaries*, documents every teaching and learning activity in the two classrooms, and provides a holistic perspective on the data (see Appendix 1 and Chapter 4). This broad analysis indicates how each overall unit of work is organised and defines major patterns of discourse. It also provides a context for the later more detailed analyses. From this broad analysis there emerge a number of themes which are taken up in the more detailed examinations of texts in the later chapters.

The second level of analysis (Chapters 5, 6 and 7) focuses on selected excerpts of discourse (referred to in the analysis as *texts*), and further explores the themes from Chapter 4. The illustrative texts discussed in these three chapters have been selected as representative of the regular occurrences and typical discourse patterns identified by the episode summaries. As discussed earlier, Chapters 5, 6 and 7 each

take a different perspective on the analysis, in line with the argument in Chapter 2 for a theorisation of pedagogy to take account of multiple perspectives.

PART 4: THE LANGUAGE MODEL

Introduction to the model

If we accept that teaching and learning is about meaning-making, then a study of the discourse of teaching and learning should likewise be informed by a grammar which explains how language makes meaning. This study draws on systemic functional grammar (henceforth SFG) following the work of Halliday and other linguists who work within this tradition[8]. The choice of this model of language is relevant for a number of reasons; primarily because of its concern with how meanings are made, but also because of its compatibility, and complementarity with both the social perspective on learning and teaching outlined through the survey of background literature in Chapter 2, and with the methodological approach discussed earlier in the current chapter. This section discusses those aspects of SFG which the study draws on, and continues with discussion of the particular relevance of SFG to the study.

The two traditions which together have led to the development of the study of language in context, come from Malinowski and Firth, and from Sapir and Whorf (Halliday 1991). From the former comes the notion of the situation as the context for language as text, through which social relationships and social processes are enacted. From the latter comes the notion of culture as the context for language as system, where language is a form of reflection, a construal of experience into a model of reality. These two theoretical sources together create the foundations of a functional semantics or theory of meaning. Halliday argues that the entire construction of grammar is bound up with the situational and cultural contexts in which language has evolved:

> a theory of language in context is not just a theory about how people use language, important though that is. It is a theory about the nature and evolution of language, explaining why the system works the way it does; but with the explanation making reference to its use ... It is a functional explanation, based on the social-semiotic interpretation of the relations

8 A glossary of SFG terms can be found at the end of this section.

> and processes of meaning ... I think this last point is fundamental in our language education work.
> (Halliday 1991, p. 6).

A full description of the grammar is beyond the scope of this chapter, which aims simply to identify and briefly describe those areas of the grammar which are of most significance to the discussion of the data. A fuller and more complete description can be found in a wide range of work based on the work of Halliday and linguists and educationists who have worked with him, (see for example, Halliday 1975, 1978, 1984, 1985a, 1985b, 1993; Halliday and Hasan 1985; and also Poynton 1985; Painter 1984, 1988; Hammond 1990; Macken and Rothery 1991; Derewianka 1990, 1992; Martin 1984, 1993; Eggins 1994; Gerot and Wignell 1994; Rothery 1985a, 1985b).

The dominant linguistic paradigm of the 1960's and 70's, Chomsky's transformational grammar, studies language as an idealised abstraction, in terms of the linguistic 'competence' underlying linguistic 'performance', and thus as separate and in isolation from the contexts in which it is used and its real-life instantiations. Halliday (1984), like Chomsky, defines as 'philosophical grammars', those grammars which represent the study of the linguistic code in isolation from behaviour, so that the system is explained without regard to its use. Central to the way that philosophical grammars are organised is the concept of the rule. The code is represented in terms of rules of grammar, which do not account for the ways in which language varies or is used in real-life contexts; philosophical grammars are thus essentially reductionist. Such grammars necessarily operate on the basis of a polarisation between the 'ideal' and the 'actual': what people actually say represents a departure from the rules of the 'pure' language, (hence such distinctions as Chomsky's 'competence and performance', and Saussure's 'langue and parole'). Ethnographic or descriptive grammars, on the other hand, seek to close the gap between language as code and language as behaviour: the system is not dissociated from the instance. A systemic description attempts to interpret simultaneously both what language is and what people do with it, thus interpreting language in relation to its place in people's lives. It treats language simultaneously as both code and behaviour, as both system and resource, and aims to explain what kinds of meanings people make, and what linguistic resources they draw on to make meaning in a specific cultural situation. Language is therefore characterised as a resource, with the basic organising concept being that of choice.

Transformational and systemic functional grammar also differ in another respect which is of particular relevance here. Transformational grammar is informed by a mentalist account of language which suggests that children are born with a genetic blueprint enabling them to deduce the rules of the language. The talk they hear around them functions as a trigger for language acquisition and a testing ground for their developing hypotheses about how the language works. From this perspective, many of the major milestones of language, particularly spoken language, have already been passed by the time children start school, and so the language of teachers and carers is not seen as of great significance in children's language development. In contrast to this theory, the functional and interactional theories of Halliday and other linguists present the view that children have to learn to use language for a range of purposes and in a range of cultural and situational contexts. Rather than viewing language as a finite set of rules which must be 'acquired', systemic theorists view language as a semiotic system, as a set of choices from which speakers select according to the particular context they are in: a speaker makes a particular choice from a range of possible options. From the perspective of the grammar, each of these choices can be viewed against the possible choices that could have been selected, hence the notion of 'system', and language as a 'system of systems'. Every meaningful stretch of written or spoken language, referred to as a 'text', represents a particular instantiation of the resources of language. This semiotic interpretation of language, which views language as a set of resources rather than as a set of rules, makes it possible to consider the appropriacy or inappropriacy of language choices in a given context of use.

SFG argues that language use is influenced by three aspects of the immediate context of situation: the field of the discourse, the tenor of the discourse and the mode of the discourse. These features constitute the linguistic *register* of the text. The field of discourse is the cultural activity, what the language is being used to talk about. The field of much of the discourse with which this study is concerned, is science, specifically the field of magnetism. There are also however two secondary fields, identified as 'language' and 'the social rules of the classroom', which are discussed in Chapter 4. The tenor of discourse refers to the relationship between participants, between the speaker and the listener, or the writer and reader. The tenor of discourse can be influenced by a number of factors, including status (the relative status of the participants), affect, (their affective relationships, including how they are feeling towards each other at the time), and contact, (how well they know each other or how frequently they are in contact). In this study, the relationships which are foregrounded are those between teacher and students, with status and affect as significant dimensions of the tenor. The mode of the discourse

is the channel of communication, whether it is spoken or written. Martin (1984a) suggests that two kinds of distance are involved here: spatial distance between those interacting, (for example, whether they are face-to-face); and experiential distance, or distance from the activities which are the focus of the discussion (for example, whether the language is accompanying action or reflecting on it). Because an analysis of mode is of particular importance in some sections of this study (see Chapter 5 in particular) it is discussed in further detail later in this section.

These three aspects of context make a difference to how speakers use language, that is, they each have linguistic consequences: "text carries with it, as a part of it, aspects of the context in which it was produced" (Eggins 1994, p. 7). These three register variables correspond to the three metafunctions of language, which allow three kinds of meaning to be made using the lexico-grammatical resources of the language. There is therefore a systematic relationship between the categories of register and the structure of language. Halliday describes these three kinds of meanings as ideational (comprising experiential and logical meaning)[9], interpersonal and textual. Experiential meaning is concerned with representing and making sense of the 'real world', and with reflecting on and understanding the environment and the world of ideas. Interpersonal meaning is concerned with participating in the world, enabling people to act on the world through their interactions with others. This strand of meaning enacts personal relationships; it expresses the role relationship between speaker and listener, and the speaker's attitude to the subject matter itself. Textual meaning is concerned with shaping and organising different kinds of texts. Each of these strands of meaning is needed in order for people to make sense of each other and the world: "language is as it is because of what it does" (Halliday 1991, p. 6).

Given a certain field, choices are made from within the resources of the experiential function of language, given a certain tenor, choices are made from within the interpersonal resources of the language system, and given a certain mode of communication, choices are made from within the textual resources of the language system (Derewianka 1992).

Because of this systematic relationship within the language between meanings and contexts, it becomes possible to predict how a given context will determine choices

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9 Ideational meaning has two components, experiential meaning and logical meaning. This study does not discuss logical meaning, and the term experiential is used as a general term henceforth.

from the language system, and also how the language system itself constructs context. Eggins comments on the evidence of this two-way relationship:

> Our ability to deduce context from text is one way in which language and context are interrelated. Our equally highly developed ability to predict language from context provides further evidence of the language/context relationship.
> (Eggins 1994, p. 7)

Halliday expresses it thus: "the context plays a part in determining what we say; and what we say has a part in determining the context" (Halliday 1978, p. 3).

Since language reflects the use to which it is put, and because it varies systematically according to the situation in which it occurs, there will be certain recurring predictable features which occur each time a particular situation occurs. It is this relationship between meaning and context, and between context and language, that underpins much of the analysis of this study, and enables the relationship between different discourse registers and specific teaching and learning situations to be made explicit.

A significant aspect of the metafunctional principle, and one which again sets SFG apart from formal grammars, is the claim that any text simultaneously makes three kinds of meaning by drawing on the lexico-grammatical resources of each of the three metafunctions. The metafunctional principle is significant for learning theory, since "it is the combination of the experiential and the interpersonal that constitutes an act of meaning. All meaning — and hence all learning — is at once both action and reflection" (Halliday 1993, p. 101). Chapter 2, drawing in particular on the work of Cummins, has argued that all teaching and learning involves the construction of particular kinds of interpersonal relationships between teacher and taught, and that how these are realised is particularly significant for minority groups. The capacity of SFG to analyse interpersonal meaning simultaneously with experiential meaning is therefore of significance in a study concerned with the education of minority groups. As Halliday states:

> [People] do more than understand each other, in the sense of exchanging information and goods-and-services through the dynamic interplay of speech roles. By their everyday acts of meaning, people act out the social structure, affirming their own statuses and roles, and establishing and transmitting the shared systems of value and knowledge.
> (Halliday 1978, p. 2)

The discussion so far has focused on the notion of register, which explains and describes the relationship between a text and its situational context, and on the related metafunctions of language. SFG also takes into account the cultural context in which the text was produced, in particular the purpose of the text, and therefore its *genre*. Genres represent different ways of organising human experience and knowledge, and are thus goal directed. A genre has been defined as a purposeful, staged, cultural activity (Martin 1984a; Martin, Christie and Rothery 1987), and includes both spoken and written activities. It is characterised by a distinctive schematic structure, a distinctive purpose and a distinctive set of probable lexico-grammatical choices. While this study draws mainly on register theory in the interpretation of the data, the construct of genre has been found useful in theorising the stages of the major teaching and learning sequence that characterises the classroom program. This use of the notion of curriculum genres and macro-genres draws in particular on the work of Christie (1994, 1995) and is discussed further in Chapter 4.

The mode continuum

The broadest distinction that may be made in relation to mode is between spoken and written language. The linguistic differences between these two modes have been discussed many times, for example Martin 1984a; Halliday 1985b, Christie 1985, 1986; Kress 1987; Christie and Rothery 1989; Derewianka 1990; Hammond 1990; Eggins 1994. In summarising the characteristic features of spoken and written language, Eggins notes that spoken language typically involves turn taking; is context dependent and dynamic in structure; is characterised by 'spontaneity phenomena' such as false starts, incomplete clauses and hesitations; uses everyday lexis and non-standard grammar; and is grammatically intricate and lexically sparse. Written language, on the other hand, typically has a monologic organisation; is context independent and synoptic in structure; is 'polished' rather than spontaneous; uses 'prestige' lexis and standard grammar; and is grammatically simple and lexically dense (Eggins 1994, p.57).

In reality however, and if the effect mode has on language choices is to be fully recognised, then this distinction between spoken and written language is more accurately viewed as a scale or continuum. Martin (1984a) suggests how aural and visual contact affect language choice: a telephone conversation for example, removes visual contact and hence requires different sorts of language choices from those made in a face-to-face conversation, whereas radio on the other hand

removes the possibility of both visual contact and aural feedback. Consideration of these factors makes it possible to set up a scale beginning with face-to-face dialogue; then, along the scale, to telephone conversations, to TV and radio, to a letter and book, and finally to writing. Martin argues that mode is also affected by the distance dimension between language and what is being talked about, a dimension which opposes language in action to language as reflection. At one end of this scale might be talk among players in a game of cricket, and at the other, a philosophical treatise on sport. Between these two poles, Martin suggests a number of hypothetical situations, each further distanced from the original event: a commentary on the game on TV, a commentary on the same game on radio, an interview with the players after the match, and a report of the game in the paper the following day. Broadly these can be viewed as *language in action* (the game), *commentary* on action (TV or radio 'play by play'), *reconstruction* of action (interview, report or review) and *construction* (book or treatise on cricket).

> What is happening along this scale is that language is getting further and further removed from what it is actually talking about, not simply in terms of temporal distance (distance from the scene of the crime as it were), but eventually in terms of abstraction as well. Abstract writing is not really about anything you can touch, taste, hear, see or smell, though of course, in the end, if what we write is in any sense empirical, it must connect with observable facts of some kind or other.
> (Martin 1984a, p. 26)

Thus although spoken and written language have distinctive characteristics, it is also clear that there is no absolute boundary between them. Modern technology increases this blurring: sending an e-mail, although it is in the written mode, often produces the kind of informal language that has much in common with speech. Similarly, leaving a lengthy message on an answer machine may be quite linguistically demanding, since it is a relatively context-reduced task which requires us to 'speak aloud' the kind of language that would more usually be written. Rather than referring to language as 'spoken' or 'written' therefore, it is more descriptive of actual situations to use the terms adopted by Derewianka (1990) who refers to texts at different points along the continuum as "more spoken-*like*" or "more written-*like*."

The following four texts indicate the sorts of language changes that occur as a result of this spatial and temporal distancing, and are illustrative of the notion of a 'mode continuum', a construct which this study explores in some detail in the context of

the classroom. The four texts show how certain linguistic features change, in predictable ways, as language becomes increasingly more written-like, or context-reduced, and closer to a written form. The texts were collected in a classroom of ten year old students. They are included here for illustrative purposes and are not part of the current corpus.

Text 1:

(spoken by three ten year old students and accompanying action)

this . . no it doesn't go . . . it doesn't move . . .
try that ...
yes it does .... a bit... that won't . . .
won't work it's not metal. . .
these are the best . . . going really fast.

Text 2 :

(spoken by one student about the action, after the event)

we tried a pin . . . a pencil sharpener . . . some iron filings and a piece of plastic . the magnet didn't attract the pin but it did attract the pencil sharpener and the iron filings . . it didn't attract the plastic.

Text 3

(written by the same student)

Our experiment was to find out what a magnet attracted. We discovered that a magnet attracts some kinds of metal. It attracted the iron filings, but not the pin. It also did not attract things that were not metal.

Text 4

(taken from a child's encyclopedia)

A magnet is a piece of metal which is surrounded by an invisible field of force which affects any magnetic material within it. It is able to pick up, or attract, a piece of steel or iron because its magnetic field flows into the magnet, turning it into a temporary magnet. Magnetic attraction occurs only between ferrous materials.

Text 1 is typical of the context-embedded language produced in face-to-face contexts. There is a use of exophoric reference (*this, these, that*), since the visual context obviates the need to name the referent, and as a result, there is a relatively low lexical density. In Text 2 the changes in language are the result of a change in context. The original experience is now distanced in both time (the text occurred later) and space (the student no longer has the science equipment in front of her). The speaker reconstructs the experience through language, and so makes explicit the participants (realised through nouns and pronouns: *we, pen, pencil, pencil sharpener, piece of plastic*) and processes (realised through verbs: *tried, attract*). Text 3, a written text, is further distanced from the original event, since the audience is now unseen; written texts cannot rely on shared assumptions and a writer must recreate experience through language alone. Here, for example, an orientation is needed to provide the context for what follows: *Our experiment was to...* There is also the inclusion of a generalisation — *a magnet attracts some metals.* In Text 4 the major participant (*a magnet*) is generic: its properties are those of all magnets. There is a further increase in lexical density, and the text includes a nominalisation, the coding of a process term as a noun (*attraction*) which is typical of much written text, and increased numbers of circumstances, which give details about where, when and how processes occur: *within it, into the magnet, between ferrous materials.* [10]

These four texts illustrate what Martin refers to as "the general concept of contextual dependency" (Martin 1984a, p. 27), referring to the ways in which text meanings need to become increasingly explicit as less can be taken as shared between speaker-listener or reader-writer:

> Are the meanings of the text largely implicit, in the sense that unless we can see what the participants are doing we can't really understand what's going on? Or is the text explicit, independent of context, so that simply by reading the text we can understand what the text is about ... The more speakers are doing things together and engaging in dialogue, the more they can take for granted. As language moves away from the events it describes, and the possibility of feedback is removed, more and more

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[10] Note that the terms *context-reduced* and *decontextualised* as used in this study have the specific linguistic meaning indicated here, and refer to the way in which language changes as it is distanced in time and space from the original and immediate context in which it was located. The term does not imply the notion '*out of* context', nor language which is in some sense 'disembedded' and unrelated to a context, an interpretation which would be very much at odds with the linguistic model used in this study. This issue, and the terms themselves, are discussed in the final chapter.

> of the meanings a text is making must be made explicit in that text if they are to be recovered by the reader, no matter how well informed.
> (Martin 1984a, p. 27)

Using Martin's categories, Text 1 represents 'language as action', Texts 2 and 3 represent 'language as reconstruction', and Text 4 represents 'language as construction'. In Text 3 there is also some evidence, in the generalisation *a magnet attracts metals*, that the writer is beginning to move away from reconstructing personal experience towards constructing a new interpretation of the events in which she has taken part.

The notion of contextual dependency is an important one in relation to this study. As discussed in Chapters 1 and 2, language development is partly realised by the degree to which learners are able to produce explicit text, and, as has been argued, it is the ability to produce increasingly more explicit or 'decontextualised' text which learners may not always master in their second language. As was pointed out in Chapter 1, one of the specific aims of the study is to explore the process of teaching this more 'decontextualised' language within the classroom, and how the subsequent practices can be described in linguistic terms. The construct of the mode continuum offers considerable potential for exploring this issue in the school context. Young children's first language development reflects the spoken-written continuum; the language of the 'here and now' develops long before a child learns to reconstruct their experiences through language alone, or to express generalisations (see Halliday, 1975, 1993, and also, for a different perspective, Moffett 1968).

At a more macro level, the continuum reflects the process of formal education itself, as students are required to make shifts within an increasing number of fields, and to move from personal everyday ways of making meanings towards the socially shared discourses of specific disciplines. Clearly a second language learner is likely to have fewer difficulties with producing a language-as-action text, where the visual context itself provides meanings, and where they do not need great linguistic resources, than with more context-reduced texts, where there is a greater demand placed on the learner's lexico-grammatical resources. In the classroom, an oral 'reporting' stage, (like text 2 in the set of four texts examined above), is, surprisingly, often not given much attention, and while infant and primary classrooms are rich in the provision of experiential learning activities, children are frequently expected to write simply on the basis of these personal experiences, which represents a very large linguistic step (as can be seen by comparing texts 1 and 3 above), and one which is beyond the linguistic resources of many young

second language learners. In the current study, a major focus is given to the way in which students can be supported in the development of spoken, but more context-reduced, language, as a way into gaining control of the more formal, and often written, registers of the curriculum. The analysis of how this occurs draws largely on the notion of mode, and the mode continuum.

Types of exchanges

There is a further aspect of the grammar which should be commented on here, which concerns the analysis of dialogue. In speech act theory (Austin 1962, Searle 1969, 1979), a class of speech acts is treated as a structure or described as a set of rules which speaker and listener must share. In systemic linguistics, the process of dialogue itself is seen as a shared potential, and described in terms of the network of choices made by speakers, so that the exchange of meanings is an ongoing process of contextualised choice (Halliday 1991).

Halliday (1985b) interprets dialogue as a process of exchange, involving two variables: the nature of what it is that is being exchanged, and the roles defined by the exchange process. What is exchanged may be 'goods and services' or information. Goods and services involve non-verbal commodities, for example, the request for action in *Can you pass me that book?* Language is used to bring about the exchange but is distinct from what is being exchanged. In contrast, information is only brought into being through language (or other semiotic systems), as in *It's ten o clock*. Here language actually constitutes the exchange; it is both the means and the manifestation of the exchange. The second variable in the exchange is the role of the speaker, which may be one of giving or receiving, and simultaneously assigns an equivalent role to the listener. If A is giving something, B is receiving it; if A is demanding something, B is called on to give. Thus if a speaker asks: *What time is it?* (demanding information) the listener is obliged to reply: *It's ten o clock* (giving information). There are therefore exchange-initiating roles and responding roles, and these will be reversed as the addressee in turn becomes speaker.

In a child's language development, the ability to exchange information develops much later than the ability to exchange goods and services. Halliday describes the emergence of information in the child's developing language system as the ability to "impart meanings which are not already known". He writes:

> ... when children are first using language to annotate and classify experience, the particular experience that is being construed in any

> utterance is one that the addressee is known to have shared. When the child says *green bus*, the context is 'that's a green bus; you saw it too (and can check my wording)'. What the child cannot do at this stage is to impart the experience to someone who has not shared it ... As they approach the end of the transition [from protolanguage], children learn to create information: to use language not just as a rehearsal of shared experience but as a surrogate. They learn to tell people things they do not already know. This is a complex operation because it involves using language to "give" a commodity that is itself made of language (as distinct from using language to make an offer, where what is being "given" is a non-linguistic commodity ... that is independent of the language that is being used to offer it).
> (Halliday 1993, p. 102)

This aspect of the grammar becomes important in considering the nature of teaching and learning activities, and in predicting whether they are likely to create a context for the exchange of a commodity or the exchange of information. For teachers this is an important question, since a particular teaching and learning task may simply not provide the context for the kind of language that teachers expect students to use. For example, students (or indeed any other speaker) are unlikely to use a written-like register with field specific lexis in an experiential task where there is face-to-face contact between participants, not because they are unable to, but because within the situational context it is inappropriate and unnecessary.

The type of exchange also intersects with aspects of mode. Exchanging goods and services implies a here-and-now context, and hence an orientation to language-as-action. Exchanging information on the other hand is likely to be less context dependent, since what is being exchanged is language itself, and hence there is likely to be an orientation towards language as reflection. Exchanging information clearly demands greater linguistic resources than exchanging a commodity, as is demonstrated by the order of development in the child's language.

In exchange sequences, a further distinction has also been drawn between the roles of the speakers: between the 'primary knower', the speaker who 'knows' the information, and the 'secondary knower', the speaker to whom the information is imparted (Berry 1981). Taking into account these speaker roles suggests a number of implications for classroom talk, where typically teachers are the primary knowers but ask questions in the guise of being secondary knowers. Berry refers to this as "the delaying of the admission of knowledge in order to find out whether the

secondary knower also knows the information", and in this case the "consequent stamping of the information with primary knower's authority" occurs at the third stage of the three part teaching exchange (Berry 1981, p. 127). Once this has occurred, however, all further elements of the exchange are optional. (Thus it would be highly unlikely for a student to respond to a teacher who has said something like: *yes that's right).* Since Chapter 2 has argued that a classroom which is enabling of second language development needs to include talk which is dialogic, and that it is important for students to have opportunities to initiate exchanges, then a consideration of speakers' roles and of the obligatory/optional distinction is particularly relevant in considering how teaching exchanges can be extended beyond the three part exchange. Chapter 7 discusses this further through an analysis of the potential for language learning purposes of the third move of this exchange.

Relevance of systemic functional linguistics to the study

In the previous discussion the relevance of SFG to the current study has already been suggested. This section extends that discussion to more general issues which are significant to the study.

It has been argued that many studies which select aspects of language as data for educational statements have no principled basis for this selection, that is, "surface features of the language are picked out randomly without being related to underlying linguistic statements and descriptions" (Stubbs 1986, p. 235). These studies simply "scratch the surface" of the available linguistic data (Stubbs 1986). It is often then difficult to see the direct relationship between isolated surface features of language and particular teaching strategies, between, for example, the number of closed questions a teacher uses and their teaching style. Arguing that to proceed directly from isolated features of language to social-psychological categories is reductionist, Stubbs argues that studies which code utterances as pedagogical acts (such as *lectures, praises*), and then take these as evidence of a particular teaching style, ignore the inherent structural and systemic complexity of language. Classroom language is hence excised from its context in that it is treated in isolation from other types of social interaction which are organised by comparable sociolinguistic rules.

Frequently in such work, there is little discussion of how the selected features of language illustrate the claims made about the educational process [11].

If language is to be used as evidence of social processes and structures, it must be studied as a system, not as isolated items. Theories of language which ignore its social context of use would therefore appear to be of little help to an analysis of educational talk. Any discussion of features of classroom discourse must instead be related to general socio-linguistic principles of language behaviour, which are drawn from observations of language in use in other settings (Stubbs 1986). In line with these principles, SFG provides a principled model for interpreting language as a set of systems, and any systems which the analysis draws on can also be related to general principles of socio-linguistic behaviour outside of the classroom.

Stubbs also argues that as a consequence of focusing on the surface features of language, educationists may be missing a much richer source of information about learning and teaching (Stubbs 1986). This study is concerned with issues such as how students can be helped to accommodate new conceptual frames within the interactions of the classroom, how ongoing interactions can be analysed to identify shifts in students' conceptualisations towards more comprehensive frames of reference, and how teachers can maximise the potential of dialogue for language teaching purposes. What is needed in order to consider these questions is a theory of language which can be applied to discourse, including the extended sequences of discourse which take place over a number of weeks in the classroom. If classroom interaction is treated at the level of discourse, one of the things that can be studied is how teachers control it, ultimately leading to an understandings of the transmission of educational knowledge itself (Bernstein 1971; Halliday 1991). Studying teacher-student talk as discourse can therefore "provide educationally interesting insights which are not available to studies that bypass this organization" (Stubbs 1986, p. 243). Among such insights, Stubbs includes several which are relevant to this study and are addressed within the analysis, namely how classroom discourse is sequentially organised; how teachers present bits of knowledge to students; how topics are introduced, broken up and ordered; how student contributions are reformulated; and how items of knowledge are paced and allowed to emerge when the teacher considers it appropriate. Such topics cannot be studied (other than in an ad hoc way) by looking at isolated language features; they

11 Stubbs refers specifically to the work of Flanders in this regard, and is critical of it for the sorts of reasons given. However, it should be pointed out that this early work by Flanders, carried out in the early seventies, represented at the time the breaking of new ground in the analysis of classroom discourse.

can only be studied "by studying the overall structure of the teacher-pupil interaction as a discourse system" (Stubbs 1986, p. 243). The study of such topics also requires not just an examination of single lessons, but, as argued earlier, of sequences of lessons. Mercer likewise argues for classroom discourse to be viewed as a "long conversation that lasts for the whole of their [teacher and students] relationship" (Mercer 1995, p. 70), and insists that any theory for explaining how talk is used to create knowledge, must take into account the concepts of context and continuity. (The notion of the 'long conversation' is particularly significant in this study in examining enabling factors for second language learning.) SFG provides a tool by which it becomes possible to examine holistically the total discourse of a unit of work, so that, for example, it is possible to examine differences between the exchange structures of teaching and learning activities at the beginning and end of topics, to explore the gradual movement in the discourse from an 'everyday' to a more scientific register, and to see how teachers gradually reduce the 'scaffolds' they provide for students.

A systemic functional approach is also congruent with the methodological approach taken in this study, which explores the theory-praxis nexus, since it removes the dichotomy made in traditional and formal grammars between the 'ideal' and the 'actual'. This dichotomy places a potential barrier between the theory (of language) and its practice (in the classroom), and so is unhelpful in a study which attempts to theorise practice. A further point is that one of the aims of this study is to explore the role(s) of the teacher in her interactions with children. A functional theory of language (like a Vygotskian view of learning) which has an active role for teachers, is clearly more congruent with this aim than are transformational theories which do not 'map on' to educational concerns. (It is worth noting that Chomsky himself has disavowed any pedagogical intent in his work.)

In addition, SFG, as a social view of language and language development, is both compatible with and complementary to the neo-Vygotskian social view of learning suggested in Chapter 2, which argued, from several perspectives, for the importance of interaction in the educational process. Like Vygotsky, Halliday views learning as social in origin, and performed largely through interaction, and hence both view language as central to the developmental process (Wells 1994b). Halliday argues that children's language learning is not simply one type of learning among many, but the foundations of learning itself: "the ontogenesis of language is at the same time the ontogenesis of learning" (Halliday 1993, p. 93). The child learns:

> ... to construct the system of meanings that represents his own model of social reality. This process takes place inside his own head; it is a cognitive process. But it takes place in contexts of social interaction, and there is no way it can take place except in these contexts. As well as being a cognitive process, the learning of the mother tongue is also an interactive process. It takes the form of the continued exchange of meanings between self and others. The act of meaning is a social act. (Halliday 1975, p.139)

For Vygotsky, as discussed in Chapter 2, language is also the 'tool of tools'; the inner speech of an individual has its origins in the earlier social speech in which the individual has been a participant.

Although there are some clear differences between the work of Halliday and Vygotsky [12], their claims are in some ways remarkably similar, especially given their divergent starting points and interests. And in both cases, the work that has probably had the greatest impact on the thinking of educators are their respective studies of language development, where both take a genetic approach (Wells 1994b). Halliday's model is also particularly congruent with the way that Leont'ev (1981) discusses the notion of tools. In Leont'ev's model of activity theory, tools have a central role, for "the tool mediates activity and thus connects humans not only with the world of objects but also with other people" (Leont'ev 1981, p. 55). Halliday's model of language represents this linguistically, since, through the interpersonal and ideational functions of language, any act of meaning embodies both the world of humans and the world of objects.

As indicated earlier, one of the aims of the study is to theorise pedagogy by bringing together theoretical perspectives derived from fields of study which do not always overlap, to recognise common insights, and to draw links between them by reading one in terms of another. SFG provides a tool for articulating, in linguistic terms, important pedagogical insights from these other fields. Terms common within SLA literature, (such as message redundancy, comprehensible input, or negotiation), or from neo-Vygotskian approaches to teaching, (such as scaffolding, appropriation or contingency), provide important insights for teaching, and represent practices which many effective teachers carry out intuitively. However, if

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[12] One difference in their thinking is that, from the point of view of the genetic approach, they are in one sense working in opposite directions. While Vygotsky attempts to explain individual mental functioning through social interaction, Halliday's studies on child language development are used in part to explain the nature of language as a resource for social living (Wells 1994b).

such practices are exemplified through instantiations in the classroom, and can be analysed linguistically, then what constitutes these practices can be articulated more precisely. This 'propositionalising' of intuitive behaviour, as has already been argued, is one of the strengths of ethnographic research, but when that research is concerned with linguistic issues, it requires a model of language which is sensitive to the social context of that behaviour.

The study aims to determine more specifically what patterns of discourse lead to opportunities for second language development. Given the two-directional nature of language and context, and the predictability that obtains between situational contexts and the texts that are constructed within them, a systemic model of language makes it possible to make some predictions about the kinds of opportunities specific teaching and learning activities offer for language use and development. And if we are able to define those genres and micro-interactions which prove to be enabling of second language development, then such a description of classroom discourse should ultimately provide a path towards more effective classroom action.

Glossary of linguistic (SFG) terms used

actor:

the 'doer' with respect to a material process.

circumstance:

the circumstances associated with the process and typically realised by an adverbial group or prepositional phrase.

exophoric reference:

reference to something/someone outside the text, within the immediate concrete situation in which the language is being used.

field:

the field of discourse refers to what the language is being used to talk about, and is realised in terms of the ideational metafunction.

lexis:

the 'content' vocabulary of a text

metafunction:

there are three metafunctions of language which express three kinds of meaning, each expressing one kind of semantic organisation, ideational (experiential and logical), interpersonal and textual. Experiential meaning is realised through the lexis and transitivity structures. Interpersonal meaning is realised primarily through mood choices, modality and modulation and also forms of address. Textual meaning is realised through the thematic structure of the clause.

modality:

modality refers in a general way to the linguistic resources which code meanings between positive and negative polarity. It also refers more specifically to the expression of possibility, usuality and probability. Included under the general term of modality is *modulation*, which codes degrees of obligation in relation to offers and commands.

participant:

the persons, things and abstract concepts associated with the process, typically realised by the nominal group(s).

process:

the core of the structure typically realised through the verbal group.

register:

the linguistic register of a text is made up of three situational variables, field, tenor and mode, each of which determines the appropriacy of the linguistic options and the choices made by the speaker.

tenor:

the tenor of the discourse refers to the relationship constructed between the speaker/ listener or reader/writer, and is realised in terms of the interpersonal metafunction.

theme:

the 'point of departure' for the speaker, realised by first position in the clause.

transitivity:

the system for realising the experiential aspect of meaning at clause level. It specifies the different types of process in the language, and the structures by which they are expressed. Transitivity structures consist potentially of three components: the process, the participant(s) and the circumstance(s).

CHAPTER 4

Patterns and Themes

We will note repeated occurrences of actions, shifts in focus, topics, rights of participation, and these regularities, shifts, rules and tacit agreements ... will suggest patterns — non-random sequences of actions — which will form the basis of our subsequent description ... gradually an order imposes itself. It is important that this order is one that emerges from the data rather than what one already patently knows, and the transcription and analysis process is an aid in developing this emergent order.
(van Lier 1988, p. 2)

INTRODUCTION

The aim of this chapter is to summarise overall patterns and themes which emerge from the corpus as a whole. This provides a context for the more detailed examination of key texts which are discussed in Chapters 5, 6 and 7. A detailed analysis is therefore not included here, since major points are taken up in later chapters.

The two episode summaries (see Appendix 1) provide a starting point for an examination of the corpus, and account, at a macro level, for all the data in each classroom. Throughout this study, individual episodes are referenced by means of the classroom number, followed by the number of the episode, for example 1: 10 refers to episode 10 from Classroom 1. Illustrative texts are accompanied by this reference number on the first occasion that they are used.

Part 1 of this chapter gives an explanation and rationale for the episode summaries, and discusses each of the categories included. Part 2 introduces and discusses the emergent themes and patterns that can be identified within the episode summaries. The summaries themselves are in Appendix 1.

PART 1: THE EPISODE SUMMARIES: RATIONALE AND EXPLANATION OF CATEGORIES

In this study an episode refers to a bonded unit which roughly correlates with a single teaching activity. Linguistically each new episode is marked by realisations of frames and markers, for example: *well, what we're going to do now is ...* . It is also marked by three non-linguistic features which define its opening and closing. First, each episode has a particular participant structure which is likely to change when a new episode starts, for example, students may work as individuals, pairs, groups or as a whole class. Second, and related to this, are the physical seating arrangements, which again frequently change with the start of each new episode, for example, students may be sitting in groups or pairs on the floor, sitting at individual desks, or sitting together as a whole class on a mat in front of the teacher. Third, each episode has a particular purpose or function, for example, to carry out an experiment, to share findings with others, or to write a journal entry. The term 'episode' as used here is similar to its use by Lemke (1990a). Lemke includes the following in his

criteria for defining the start of a new episode: signal words by the teacher, such as *OK* and *Now;* structural or functional changes in the activity type (for example, from triadic dialogue to teacher-student debate); topic changes; or movements by students, such as a change of posture, or putting down of pens.

Each episode is also a unit of discourse with a unifying topic and purpose. Each lesson is made up of a number of episodes, (cf Lemke who describes lessons as "basically episodic" (Lemke 1990a, p. 50) but unlike a lesson, episodes cannot be classified in units of time; functionally they are related *to each other* rather than to the larger unit of the lesson. In this sense they cut across lesson boundaries; there are for example clear intertextual relationships between the last episode of one lesson and the first of the next, both cognitively and in terms of linguistic features such as field and mode. For the purpose of this study, then, what is of interest is not a structural analysis of *lessons*, but an analysis of the kinds of meanings created *within and across the episodes*, and the intertextual relationships that exist between them. The term intertextuality is used here to refer to the ways in which the discourse produced in one episode relates to, and is interpreted on the basis of, previous discourse. As later analysis will show, these relationships suggest ways in which, through the ongoing sequence of episodes, students and teacher "relate discourse to context, and build through time a joint frame of reference" (Edwards and Mercer 1987, p. 65).

It is therefore the 'episode', not the 'lesson', which serves as the basic unit for consideration of the data. The lesson as a unit of analysis does not provide a sufficient level of delicacy for the purpose of this study which includes as a major focus the interactional patterns of the classroom, since a single lesson in the two classrooms almost always contained several different teaching and learning activities, and consequently a variety of interactional patterns, educational purposes and linguistic registers.

The episode summaries serve a threefold purpose. First, they illustrate the cumulative nature of classroom learning and classroom discourse, and indicate how curriculum understandings and language get built up across a complete unit of work or study of a topic, thus providing a tool for understanding how particular patterns of classroom interaction relate to learning. Second, they provide a contextual frame for examining and interpreting those excerpts which will be chosen for in-depth analysis in later chapters. Third, they validate those excerpts as typical and recurring patterns within the data set as a whole, serving as a check on the

representativeness of the selected texts in these chapters and making more explicit the criteria for selection of particular illustrative examples.

In the episode summaries, particular aspects of each episode are noted (see Appendix 1), and set out in the form of a table (see Figure 4.1).

Fig 4.1: Table used for Episode Summaries

	HOW			WHAT		
No	Teaching/Learning processes	Dominant participant & interaction structures	Mode/degree of context embeddedness of discourse	Knowledge constructed about science	Knowledge constructed about language	Knowledge constructed about identity/ how to be a student

The initial division within the table is headed HOW (referring to the classroom processes by which curriculum knowledge is constructed) and WHAT (referring to the fields or content of the knowledge constructed). The number of the episode, and the start of each new lesson, is also indicated. Each of these is then further classified into the three categories as shown in Figure 4.1.

The *How* and *What* categories can be broadly related to the register theory described in the previous chapter. The *How* category takes into account aspects of Tenor (in that it describes the interactional patterns set up by the teacher, and Mode (the vehicle, spoken or written, for the teaching activities themselves). The *What* category takes into account aspects of the Field (the kinds of knowledge being constructed).

Consistent with the model of interpretive ethnographic research used in this study, and discussed in Chapter 3, the six categories were not predetermined before the collection of the data. Rather, they emerged from the data as being significant in identifying the opportunities offered to ESL students for second language development in the process of the construction of curriculum knowledge. An initial analysis of the transcribed discourse, for example, revealed that the knowledge being constructed was not simply to do with science, which was the 'official' curriculum area with which the class was engaged. There was in addition

considerable talk about language, and about the teachers' expectations of students in terms of their socialisation into the classroom. Hence the identification of the categories *language,* and *identity*. It was also clear that there was a great variation in patterns of interaction, from teacher monologue to student-student talk in groups. Hence the identification of the category *participant structures*. In addition, teaching activities resulted in a constant shifting along the mode continuum between more and less context-embedded language. Hence the identification of the category *mode of discourse*. The episode summaries make it possible to examine recurring patterns of relationships, for example, between the types of teaching processes and the interaction patterns most likely to be associated with them, or to examine how sequences of episodes allow for mode 'shunting' along the spoken-written continuum.

Although, as was pointed out in the previous chapter, it is never possible to reconstruct a lesson exhaustively in the way that it occurred, nor to represent the complexity of the context, it is important that the data be contextualised for a reader, for the reader to have a 'feel' for what being in the classroom was like, the sorts of things that were said and done. An additional aim of the episode summaries is therefore to give a description of the kinds of activities that went on in the classrooms. The choice of what is included in each section of the table, and how to note it, is therefore partly determined by what will help to give a richer representation of what went on. For this reason I have chosen to include direct wordings taken from the transcripts (identified by use of italics). For example, under *Knowledge constructed about identity,* actual words taken from the transcript are sometimes included (for example: *good that you were listening)* In other places, often where the sequence is a more extended interaction, it is simply noted that such talk occurred eg. 'T talks about good listening behaviour', 'T discusses turn-taking'. This convention also applies to *Knowledge constructed about language.*

An explanation of each section in the table follows.

Teaching/Learning processes

This category describes the teaching processes and procedures of each episode. They correlate closely to what is glossed in the teacher's program as *learning activities* but were based on my own observations and field notes. The sequence of teaching processes, from episode to episode, represent the process by which curriculum knowledge was built up during the course of the unit. Although the activities here occur in the area of science, the teaching processes themselves (eg.

developing a concept map) are not always science-specific and many could occur across the curriculum.

It should be acknowledged that any attempt to name or describe classroom events and teaching processes is in itself problematic, and necessarily reflects a somewhat idealised version of events. The 'naming' of an activity reflects the orientation of the teacher and researcher, that is, the reality of such an event is, up to a point, a teacher-constructed one. For example, at times it is evident that the students may not have shared the teacher's understanding about the purpose of the activity. Thus while an episode may be described in the analysis as '*sharing of individual reflection*' the discourse that actually occurred may not always have been what the teacher might have hoped for! This point is discussed further in Chapter 7. In general, however, it is fair to state that the description of the activity remained close to what actually occurred.

Dominant participant and interaction structures

This category describes the organisation of the participants (for example, teacher to whole class, groups, individual) and the interaction pattern that occurred, (for example, IRF, teacher monologue). The entry in this category refers to the *dominant* pattern that occurred. There was occasionally a brief departure from the pattern noted in the table, where for example, the teacher interrupts group work to give a further instruction (thus where the dominant student to student talk is broken by a short IRF pattern or teacher monologue). Where this occurs it is noted, although in general such brief patterns do not significantly alter the *overall* pattern of interaction of the episode.

Mode/ degree of context embeddedness

Earlier discussion has indicated that the degree of context-embeddedness is a factor in determining the comprehensibility of language for ESL learners, while decrease in context embeddedness is a feature of the academic language they must learn to control. The mode of the episode, whether it is spoken or written, and the degree of context-embeddedness of the language demanded by the task are therefore significant factors in the description of each episode. An additional perspective offered by noting the degree of contextualisation is the relationship between episodes, that is, how far they are distanced from each other along the mode continuum. This is important in examining the significance of the temporal sequence of activities.

The *mode* category thus describes the mode of the texts produced in the playing out of each episode. When the mode is noted as *spoken*, the degree of context-embeddedness is, where relevant, indicated by using Martin's terms *language accompanying action, reconstruction* and *construction* (see Chapter 3). For example, this aspect of the episode may be described as *context-embedded: language accompanying action, language used to reconstruct personal experience* or *language used to construct generalisations*. Also included are notes about relevant 'environmental' print, for example, what is written on the board while students are talking or writing.

Knowledge constructed about science

This describes the content of the episode in terms of what has been learned about science. Decisions about what to include here (given the impossibility of defining exactly what each student has learned) have been made on the basis of the transitivity resources evident in the transcripts from both teacher and students, and on the lesson objectives stated in the teacher's program.

Knowledge constructed about language

As stated earlier, talk about language emerged as a significant field within the discourse (albeit constrained by the scientific field). Notes made in this category refer specifically to talk *about* language, not to language *use*. That is, the fact that students have made a generalisation (such as *all magnets have a north pole and a south pole*) would not be noted here, whereas talk about how it might be written (*what word might we use to begin a generalisation?*) would be recorded. While most talk about language is initiated by the teacher, there are exceptions to this. Where the talk is initiated by students it is glossed with *S*. Otherwise it may be assumed to be teacher-generated.

Notes appear in two forms, either indicating the topic of the talk (for example, 'making generalisations') or quoting directly from the transcript (*how do you say that like a scientist?*). The purpose of this category is to indicate at what points in the unit, or in which types of episodes, talk about language most frequently occurs, and to indicate the nature of such talk. It also allows for an examination of any relationship between students' metalinguistic talk and uptake evident in their subsequent language *use*.

Knowledge constructed about identity — 'how to be a student'

This has been included because, like talk about language, it emerged from the data as a secondary field within the discourse. In discussion later in the chapter, it is argued that the knowledge being constructed here appears to be part of the instructional register itself rather than simply playing an enabling role. The notes in this category are made in two ways, either by reference to the topic being talked about (*listening behaviour*) or by direct quote from the transcripts.

PART 2: DISCUSSION OF EMERGENT THEMES

A Recurring Teaching/Learning Cycle: a curriculum macrogenre

One significant theme that emerges is the significance of the teaching sequence adopted by the teachers and briefly discussed in Chapter 3 in the description of the teachers' programs. It was pointed out that each sequence of teaching and learning activities in the teachers' programs could be described from three perspectives: in terms of a mode continuum from implicit to explicit discourse; in terms of a movement from experiential to more theoretical learning; and as a constructivist teaching sequence (Driver and Oldham 1986).This sequence is now examined again in the light of its instantiation in the classroom, and drawing on an additional theoretical framework.

Christie (1995) describes each step of such a sequence as a "curriculum genre". She defines this in terms of the definition for other instances of genres in language, discussed in Chapter 3, that is, as a staged, goal-oriented social process (Martin, 1984a; Martin, Christie and Rothery, 1987). In this case, however, the genre is one which has an explicit pedagogic purpose. In attempting to capture the notion of a sequence of curriculum genres by which students are apprenticed into particular behaviours, skills and forms of knowledge through the ongoing discourse, Christie adopts the term 'curriculum macrogenre':

> A curriculum macrogenre is so called because it refers to the overall sequence or cycle of lessons in which a unit of work is developed with a group of students: such a sequence will normally involve several genres, constituting the unit which is the macrogenre.
> (Christie 1995, p. 227)

Christie describes one particular macrogenre which her data suggest to be common in the primary schools in her study. Drawing on data from a social science unit, (which revolved around a hypothetical proposal to build a nuclear power station in Darwin, and involved the writing of a discussion), Christie identifies three genres which make up the macrogenre: curriculum initiation; curriculum negotiation; and curriculum closure. Curriculum initiation establishes broad pedagogic goals; curriculum negotiation involves exploring aspects of the instructional field and the nature of the writing tasks; and curriculum closure involves drafting and finalising individual writing. Each of these genres involves a series of stages and includes specific elements, and has a functional significance in the overall structure and unfolding of the macrogenre. Christie points out that she does not claim this to be the only macrogenre within primary schools, and argues for further research to be carried out to identify others, so that a taxonomy of curriculum macrogenres may begin to be built up.

Within the current study, the episode summaries indicate another kind of recurring curriculum cycle, which is described below, and which can be conceptualised in terms of a curriculum macrogenre. The cycle is of interest in suggesting what may be an additional macrogenre in the development of the taxonomy for which Christie argues. It also provides a framework for the organisation of the analysis in later chapters.

An inspection of the category *Teaching/ Learning processes* (see the earlier discussion of the episode summaries) indicates that a repeated cycle emerges. Over the course of a number of episodes (normally between three and eight) a set of stages emerges. These stages can be identified as set out below:

Stage 1. Review and orientation; (*whole class activity*)
Stage 2. Setting up new task, (in this data, usually an experiment); (*whole class activity*)
Stage 3. Carrying out task; (*group activity*)
Stage 4. Reflection on task/ 'making sense' of what's been done; (*whole class activity*)
Stage 5. (*optional stage*) Written work based on 4; (*individual or group activity*)

(for examples, see Classroom 1: 5-7, 13-20; and Classroom 2: 12-17)

Each of these five stages is in itself a genre with predictable elements and sequence of stages (although it is outside the scope of this study to carry out a detailed analysis of the schematic structure and elements of each stage as Christie has done). At the same time each of the five genres represents the stages of a larger macrogenre; the labelling suggested above indicates their functional significance within the macrogenre. There are some minor variations to the macrogenre: on some occasions, Stages 1, 2 and 3 may be repeated before Stage 4 is carried out (see for example 2: 27-31 where the students carry out two sets of experiments before the reflection stage which deals with both sets together). In addition, Stage 5 is optional.

Stages 1 - 4 (that is, those stages primarily realised through spoken discourse) are those with which this study is primarily concerned. These stages are briefly discussed below in relation to how they were realised in the two classrooms.

Stages 1 and 2: review and set up

At the beginning of a lesson, or at the beginning of a new sequence of episodes, teachers typically first review or recap with students what they have done so far, focusing both on the information gained (what students have learned), and the processes used (what students have done). They then give very explicit instructions for the next new task, which, in these units of work, is usually a scientific experiment. The *review* and *setting up* stages always occur consecutively, with children remaining in the same position (sitting together in front of the teacher). In my field notes I noted them as a single episode and this is I believe how an observer in 'real time' would see them, since the two stages, though they have different educational purposes, are closely related temporally and spatially. When both stages are very short, they are therefore named in the episode summary as a single episode: *Review and Set Up*. In these cases this more faithfully represented how they appeared to a participant in the classroom. Such two-part episodes have a 'Janus' quality, directing students both back and forward, and hence represent an explicit link between old and new learning.

However when one or other stage is extended, for example when the teacher spends time on giving extended instructions for new tasks, the *Review* and *Set-Up* stages are treated as two separate episodes. From a theoretical perspective this has the advantage of foregrounding more clearly the differences in the interactional patterns associated with the two stages.

Stage 3: carrying out the task

Tasks were carried out in small groups. As described in Chapter 3, each group carried out slightly different tasks although each of the tasks demonstrated the same scientific concepts. The teacher visited each group in turn, but the students were responsible for carrying out the task by themselves, although they frequently had access to written instructions. This stage usually included some recording of the results by students within each group, either as brief notes, graphs or diagrams.

Stage 4: reflection on the task: 'making sense 'of what's been done

As discussed in the previous chapter, Driver (1994) asserts that the simple carrying out of experiments is not in itself sufficient, arguing that heuristic 'discovery' methods are problematic in that they expect two "possibly incompatible" outcomes: students are expected to explore a phenomenon and make inferences for themselves, but at the same time they are expected to develop standard scientific thinking. In developing scientific understandings, she argues, it is not simply the experience which is important, but what sense is made of it: "guidance is then needed to help children assimilate their practical experiences into what is possibly a new way of thinking about them" (Driver 1994, p. 47).

In these classrooms the reflection stage provided this guidance, which typically took place over a number of episodes. The most significant realisation of this stage was what is discussed throughout this thesis as 'teacher-guided reporting'. In addition, the reflection stage usually included individual writing in science journals and other small group activities and whole class discussions which supported students in making generalisations about what they had learned. As later chapters will demonstrate, teacher-guided reporting (henceforth TGR) episodes proved to be particularly significant in supporting language development. They followed a predictable pattern. Teachers invited groups or individual children to share what they had learned in their groups. These individual reports were not student monologues; teachers interacted with individual students, probed where meaning was not clear, and, in their responses, frequently recast a student's meaning into more registrally appropriate wording. At the same time, and as discussion in later chapters will show, they guided students to interpret their individual findings within broader understandings by locating students' personal recounts of what they did and found out, within the broader established framework of scientific understandings. The TGR episodes encapsulated the Vygotskian principle of assistance within the ZPD, hence their naming within this thesis as 'teacher-*guided*

reporting'. In relation to the mode continuum, TGR episodes and the other episodes in the reflection stage are significant in that they provided opportunities for the *reconstruction* of action, (as the students recounted their experiences) and the *construction*[1] of new knowledge (as they 'made sense' of these experiences in terms of broader scientific principles).

Stage 5: written work

This was an optional stage which did not occur with every cycle, although both classes made notes and other recordings while engaged in the experimental work. Individual pieces of writing were not extensive in this particular unit of work, and mainly took the form of science journal entries and wall displays of the knowledge the children had developed. The relative lack of writing within this unit was not typical of other subjects in the classrooms, nor of other units of science: a unit on "Minibeasts" for example produced extensive reports. Perhaps the relative lack of student writing here was because written texts did not provide the knowledge base for student learning as they had in other units of work. Rather, because of the experiential nature of much of the unit, the knowledge source was located primarily within these student activities, and the children's guided reflections with the teacher.

This curriculum cycle, or macrogenre, is of particular significance when considered in terms of the mode continuum. As suggested in the description of the teachers' programs in the previous chapter, and as later analysis further indicates, the doing/reflecting/writing sequence represents a clear mode shift from language accompanying action to language as reflection, a movement from context-dependent to more decontextualised language This 'plotting' of teaching and learning activities along the mode continuum is the theme of Chapter 5, and its significance for second language learners is discussed in Chapter 7.

Three 'fields' within the discourse

As suggested earlier, three distinct fields emerge from the episode summaries: knowledge is constructed about science, about language, and about how to be a student. While the majority of the discourse can be categorised as realising the primary field of 'science', there is also talk about language, (such as discussion about 'talking like a scientist') and talk about how to be a student, (such as the importance of concentrating, good listening behaviour, or working in a group). Before further

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1 See the discussion of the mode continuum in Chapter 3 for the use of these terms.

discussion of these as 'fields' within the discourse, the work of Christie on pedagogic discourse is briefly considered.

Drawing on Bernstein (1990) and the notion of pedagogic discourse as incorporating the total social practices of the classroom, Christie (1995) shows how pedagogic discourse is marked by the operation of two registers, each constituting a set of linguistic choices: an *instructional* register, which transmits specialised knowledge (such as science) and is to do with the 'content' or field of knowledge being taught, and a *regulative* register, which creates the social order and kinds of relationships which determine the manner of realisation of the instructional register, and also establishes and sequences the activities themselves. The instructional register, she argues, is realised largely through transitivity choices related to the instructional field. The regulative register is largely realised through textual themes, which shape the learning which is taking place; and through choices that realise Mood and Modality and relate to the nature of the relationships between teacher and students.

In an analysis of pedagogic discourse in a primary social science unit of work, Christie shows how one or other of these registers is foregrounded at different points in the sequence of lessons she analyses. Once the initiation stage was over, during which time the students were discussing *how* they should write a discussion genre (that is, the discourse foregrounded the regulative register), the instructional register became increasingly prominent, as students focused on *what* they should write. Christie points out that by this stage the work of the regulative register has been done: "the measure of the success of this initiation is that the regulative register is no longer realised. Its work has been done and the students operate with competence and independence" (Christie 1995, p. 230).

In relation to the current study, it is possible to interpret the discourse in the same way. Thus the instructional register is realised in talk about magnets, the regulative register, in part, in what I have referred to as 'talk about language' and 'talk about being a student'. As Christie also suggests, there is an interplay between these two registers, with what could be defined as the 'regulative' register 'fading away' at certain points. For example, the episode summaries reveal that talk about how collaborative group work should proceed occurs immediately before children carry out a group work task, but rarely during the group work itself, since at this stage, in Christie's words, its 'work has been done'. Similarly, talk about language occurs most often before or during those activities when students are expected to shift into a more formal register, but not at those times when students are engaged in experiential work.

However, I will argue that to interpret these aspects of the regulative register simply as serving an enabling function is, in these classrooms, to underplay their significance in the discourse as a whole, which, as will be seen in the examples that follow, was extensive. Rather, they appear to have the status of co-existing, or secondary, instructional registers. This interpretation is suggested by interviews with the teachers and inspection of their teaching programs. Teachers indicated that they considered these aspects of the classroom as important teaching objectives in their own right, a statement substantiated by their teaching programs which include specific reference to aspects of language, and to the development of children's ability to work collaboratively. For example, under a heading *values and attitudes* there is reference to *working cooperatively in groups, valuing each other's work and responses,* and *providing constructive criticism.* Talk about language and about being a student appeared to be, in these classrooms, not solely a function of the task at hand or a concern with immediate classroom discipline, but a matter of proactively teaching 'new' language and the social rules of the classroom culture to students unfamiliar with them. This concern with matters other than the immediate instructional register is in line with Delpit's argument (Delpit 1988, and see Chapter 2) that minority groups are supported in their learning of a new language and culture by being taught about it explicitly. It can be argued that learning how to be a student, and developing the language of instruction as a second language, (in other words, learning how to learn in the dominant culture), is *additional to* — as well as *enabling of* — the learning of specific field knowledge. In addition, such understandings are presumably transferable to new contexts. As Saville-Troike (1985) points out, the socialisation process of school, though a part of all children's learning, takes on a greater significance for those less familiar with the dominant culture; she notes in her study that the criteria to judge readiness for minority children entering their second year of school appeared to be more related to whether the rules for appropriate behaviour and appropriate attitudes had been developed than to the content knowledge learned.

These three fields of the discourse are each briefly discussed here.

Science

The episode summaries suggest that, in terms of curriculum 'content', comparatively little science appears to have been taught or learned. While this is in part a function of the summary itself, (which is not intended to represent a detailed analysis of curriculum learning), it is also significant given that, as later chapters will show, a

great deal of teaching and learning did in fact actually occur. What this suggests is the problematic nature of attempting to represent learning in terms of quantifiable items of knowledge, especially in documenting the learning of students who are learning through a second language. The additional achievements of these students in the learning of language and culture may often not be captured, which has implications for the kinds of assessment used with second language learners (McKay 1992).

There are also implications for the planning of curriculum for second language learners. While this study, for reasons of equity, argues strongly against the notion that minority learners should be given an alternative curriculum, where this implies a watered-down version of the standard curriculum, it is also unrealistic and equally inequitable to assume that the standard curriculum should be presented in the same ways to all students. What the teachers in this study appear to have done is to reduce the amount of content to be 'covered' but, as later chapters will show, to use this as the vehicle for in-depth focus on language development and the processes of science learning. In Hawkin's words, the teachers' focus is on 'uncovering the subject' rather than on 'covering the curriculum' (Hawkins, cited in Duckworth 1987, p.7).

Van Lier also points to the significance of process approaches for minority groups:

> Education that is based on a specification of subject matter, on performance in tests, and on measurements of outcomes of one kind or another, is product oriented. Such education can work quite well for highly motivated students with strong, supportive home backgrounds, in other words the elites which have traditionally done well in school and for whom the school system was originally designed ... However, in a system in which all children have the right to be educated, and in which there is a great diversity of cultures and languages, a process-oriented approach is needed to engage the students and allow them to grow academically. A process-oriented approach must of necessity be conversational in character.
> (van Lier 1996, p. 182)

Language

The episode summaries also indicate the degree to which talk about language was integrated with the learning of science. It can be argued of course that much of this talk, for example, talk which focused on the nature of generalisations or on the

meaning of specific field lexis, is a part of learning science; at a theoretical level it is impossible to separate 'content' from 'language'. Nevertheless, such talk, in the context of the science lesson, is probably not typical of many classrooms, and here reflects the focus on language development which appeared to inform many of the interactions between students and teacher. In Classroom 1, for example, 9 out of 27 episodes included or consisted of extended talk about the language students were being expected to use. In Classroom 2, 26 out of 45 episodes contain some talk about language, 20 of which include extended interactions.

Talk about language encompassed both learning *about* language and learning *to use* language. Both teachers included a focus on helping students understand certain meta-linguistic notions. For example, the notion of register informed many of their interactions with students. Though the term *register* itself was not used, many interactions indicated that one of the teachers' objectives was to help children understand that there are particular ways of talking and writing in science which are different from everyday talk, as the following examples show:

> remember we're scientists and we need to use the proper words/ all of you told me and explained it very well/ now we're going to learn the proper scientific words for this (1:8)
>
> I'd like for you to say it in a sentence so we get used to our proper scientific language (1:8)
>
> remember we're scientists now (*reminding a student who has used 'stick to' rather than 'attract'*) (1:8)
>
> Gina we're trying to talk like scientists now (1:8)
>
> I want to make certain that we can talk like scientists (1:8)
>
> now let's start using our scientific language Michelle (1:8)
>
> [we're trying] to begin to talk like scientists/ when we're studying science we need to 'talk like scientists (1:11)
>
> I'm just going to give you another word/ and that is the word for what Joseph was trying to say/ one more *scientific* word (1:15)

(to me, in front of children) my goodness aren't they speaking well/ just like scientists (1:17)

let's have a brainstorm of some words that we've learned about magnets so that we can *write* like scientists too (1:19)

once again thinking like a scientist/ what do you think the point of an experiment like that would be (2: 32)

we've been thinking like scientists/ we've been talking like scientists (2:32)

as a scientist can I do an experiment with every magnet in the world/ I would be spending my whole life doing it ... so when I write a generalisation what am I actually trying to say? (2:36)

That students began to understand this notion of language variation is suggested by the writing of one student (who was both a second language learner and on a special education program) who wrote in her journal: *I learned to talk like a sciencetist* (sic).

Teachers also talked explicitly with students about the changes that take place between language which is context-embedded and that which is more written-like and less context-dependent. Penny, for example, talked with students about some of the differences between talk and writing, and elicited from them some quite sophisticated meta-linguistic understandings:

S: when you're writing you have to make the people .. you have to let the people understand what you're writing and when you're 'doing something they could 'see what you're doing ... what you mean .. (1:19)

S: when someone didn't understand you got to ask them what does it mean/ that's how it's [spoken language] easier (1:19)

S: when you're writing you need more detail than ... when you're speaking (1:19)

Kath also spent considerable time helping students understand how speakers need to take account of their listeners' needs by being aware of what cannot be taken as shared assumptions, in this process helping them to understand some of the

features of more decontextualised language. Being aware of listener needs was often referred to prior to the TGR sessions when small groups of students reported to the whole class about the results of their experiments:

> *Teacher:* we all did different experiments so we don't know the results/ we only know the results of 'one experiment/ so the language you choose is going to be very clear and precise because people don't know what was going on/ because remember this morning when I was talking to you about your novels/ it's all in your head/ all that information in your novel/ and your story is in your head/ your audience doesn't know so you've got to unpack that all for them/ and it's a bit like this/ people didn't do the activities that you did/ other children didn't do them (2:21).

Later, she reminds a small group who has been practising how they will report back:

> you've remembered that your language has got to be really precise because the other children have got to try and get a picture in their mind of what you did (2:21).

As well as evaluating students' contributions to the discourse in terms of science knowledge (*right good, so you're saying they attracted*), both teachers also evaluated students' contributions in terms of their language use, positively acknowledging appropriate wording or clear explanations:

> I think that was very well told/ 'very well told (1:16)
>
> alright/ you explained that 'very well (1:16)
>
> well done/ well done for fixing up the language straightaway (*student self corrects a generalisation he has just read out*) (2:25)

In the following example, the teacher comments on the student's use of *whereas*, thereby both providing a grammatical label for the term, and describing its function:

> Student 1: the north pole and the south pole attract whereas the north pole and the north pole repels
> Teacher: well done/ that's exactly what happened/ you joined those two together/*whereas*/ some people used different sentences
> Student 2: *repeats similar response, again using 'whereas'*

Teacher: well done/ that's exactly what happens/ you used *whereas*/ the same connective there/ well done

(2: 25)

Teachers also focused on specific aspects of language use. Both teachers for example spent time discussing the nature of generalisations:

so I would like two ideas that we get from this/ two general ideas/ what we call 'generali'sations/ who can give me something that happens 'all the time/ not what just happened to us today
(1:17)

Teacher: I want you to see if you can come up with a generalisation for me ... what's a generalisation?
Student 1: something that talks about most of the things?
Teacher: alright remember when we were writing reports and we did generalisations and we were talking about 'most of the things/ so what were some of the terms/ some of the ways we started some of those generalisations
(students offer ways of starting generalisations, suggesting 'all', 'most', 'magnets')

later in the same stretch of discourse
Student 2: Miss do we write in sentences?
Teacher: yes a generalisation is written in a sentence/ that's right/ it's just a general statement/ something that you're telling me about 'most magnets or 'all magnets or 'most metal objects
Student 3: Miss what is that word you speak?
Teacher: generalisation? that's what we/ that's a statement we use when we are talking about a whole group of things (*gives further examples*)
(2:15ii)

In Kath's class, students were often asked to predict the results of experiments prior to carrying them out. Before they did this, the teacher several times brainstormed with the students what she referred to as *the language of prediction*. Students gave a range of expressions, including *maybe; I think; I suppose; this might* (2: 12). Chapter 6 includes further examples and indicates where there is some evidence of uptake.

Teachers were also careful to indicate the function of conventions; language usage was not presented as a set of arbitrary rules. Thus when children were asked to work on producing four generalisations, and to check the language they were using, the teacher reminded them that this was because the writing was to be 'public':

> you must agree on the language/ then they can go onto the cardboard so that they're public.
> (2:37)

There were also many examples of teachers checking that students were familiar with the meanings of words, and explicitly teaching new lexis:

> now we're going to learn the proper scientific words for this/ what happens is that magnets at'tract (*great emphasis*) certain things and so rather than say that it grabs it or it sticks to it/ what we say is magnets at'tract/ and that means this kind of thing (*demonstrating*) so if I am a magnet and I attract Carol Anne I 'bring 'her 'to 'me (*demonstrating*) at'tract/ so I'd like for us to think of other things that the magnet at'tracted.
> (1:8)

> can anyone remember the scientific way of saying 'sticks to'? (1:12)

> I'm going to ask you to look at the similarities and the differences/ what does 'similar' mean? (2:10ii)

> what does that mean/ 'negotiating'? (2:40)

What is clear from these examples is the degree of explicitness that characterised teachers' talk with students about language, both in terms of helping students develop certain metalinguistic understandings, and in making explicit specific linguistic items and grammatical forms which they predicted students would be likely to need to use in subsequent activities. This talk about language, and teaching of new language, occurred in the context of actual language use, so that children developed both science knowledge and language simultaneously.

Identity: being a student

Along with the development of both science and language, students are socialised into the life of the classroom, and expectations about behaviour are built up. Again

the discourse is characterised by the kind of explicitness which it has been claimed is supportive of minority groups (Delpit 1986). Effective participation, which in most classrooms involves taking initiative, can only occur when the learners know the rules of classroom discourse (Mehan 1979). Some researchers have argued that classroom realities may be so demanding that teachers are preoccupied with issues such as keeping order, organising movement, giving out resources or maintaining behaviour, and that when order and cooperation are high priorities, the nature of learning and the quality of the engagement between teacher and students become secondary issues (Webster et al 1996). In the classrooms in this study, little time was wasted on disciplinary directives, and it can be suggested that this was partly a result of the time spent making explicit the expectations of what it meant to 'be a student'. This foregrounding of the social 'rules' for interpersonal behaviour meant that teachers at other times spent time managing learning rather than managing learners and their behaviour: the regulative register, in terms of overt control, was rarely foregrounded. This is an important point, given the significance attached to group work and talk-oriented activities in language teaching, since if learners are unable to work collaboratively, even the best designed teaching activities are unlikely to be successful. In addition, the kind of dialogic and participatory classroom talk for which this study argues, is only possible given shared expectations of social behaviour.

Talk about being a student is clearly value laden. Referring to the establishment of teacher-student relationships in the study mentioned earlier, Christie (1995) writes:

> [The teacher's indirect means of establishing control] reflects her concern to set a congenial working relationship, one on which a great deal of what is to be taught and learned will be negotiated. At issue is her very strong expectation and requirement that students cooperate. A value is at work here, to do both with establishing respect for the teacher and with the value of students respecting each other and learning to work together harmoniously. Such a value is constantly affirmed through the regulative register. It has consequences for the building of the pedagogic subject, and by extension, of the institutionalised subject who will not only continue to function in school for some years yet, but who will also enter the work force and the wider community.
> (Christie 1995, p. 231)

In the current study, the kind of values to which Christie refers are also made very explicit. Talk about being a student includes several extended discussions about the

interpersonal aspects of group behaviour. Usually ideas are elicited from students, suggesting that they are familiar, at least theoretically, with what is expected. Issues discussed include taking turns, listening to each other (1:5); listening behaviour (2:9) being patient, being cooperative, using quiet voices (2:18); negotiating (2:40) sharing ideas, communicating with the group, making suggestions rather than demands, not being stubborn, completing the task in the best way rather than insisting on individual ideas (2:42).

Teachers frequently respond positively to students who demonstrate 'appropriate' behaviour, for example:

> that was packing up with the minimum of fuss and bother/ thank you that was very well done (2:14)

> (*deputy principal arrives to talk to class*) you're going to now demonstrate your maximum amount of self control to Ms M./ show how you can put everything out of your hands/ you can fold them and you can switch your attention directly to her/ Simon you did it in a flash/ well done (2:13)

> (*after asking students to stop group work*) thank you to the people who stopped straightaway (2:20)

> Julianne's going to give us another one/ she's been concentrating so well (2:27)

> (*reminding children to listen to those who are reporting back*) you also get knowledge from listening to other people/ so if the people on the floor can just put your papers down in front of them/ thank you Janet for doing the right thing (2:25)

> Andre you have been so switched on this morning/ I'm very impressed with your concentration (2: 32)

> now Milad/ good to see that you're listening (2:36)

> good to see Andre's thinking/ so's Fabiola (2: 36)

> I know I've got Simon's attention because he's looking at me (2: 14)

thank you/ excellent/ some people here are sitting and looking and really concentrating (2: 23)

Talk about appropriate and inappropriate behaviour is usually accompanied by some explanation as to why or why not such behaviour is desirable:

excuse me Francis/ if you talk I can't hear (1:7)

what's the rule when we sit on the floor Pierre and someone is speaking/ you don't speak because it interrupts others (2:11)

when you were worrying about working with Simon I was giving that instruction/ so you need to listen

can you put this down/ just to help your concentration

can you put that in the bin/ it will distract you (2: 23)

if you are looking at Duncan it's helping you to concentrate on what he's saying (2:31)

Often mention is also made of the effect of inappropriate behaviour on others. The rules for social behaviour are presented, then, not as a set of institutional, and arbitrary 'rules', but as a code of behaviour based on showing respect to peers as well as to teachers:

excuse me people/ Bernadette is speaking/ Maroun put your magnet down/ Bernadette is speaking (1: 18)

it's really difficult when you're up the front and someone is speaking ... so with Charbel we really need to concentrate/ so let's put your eyes on him/looking at him/ showing good listening behaviour (2: 23)

just need you to put that down Charbel because it's distracting for the people at the front (2:9)

please give them your full attention/ I know it's hard because you're thinking about what you're going to say but we need to listen carefully (2:41)

On one occasion, Tufik, who was often in trouble for various forms of antisocial behaviour, was involved in an argument with several peers. The argument was conducted in whispers during a TGR session, and became quite heated, at which point the teacher intervened. Even on this occasion she favours an indirect method of control, explaining to Tufik that "this stuff" prevents not only his own, but others' learning too:

> sorry/ I really (*seven second pause, looking at Tufik*) is there a problem down here/ is there Tufik/ is there something I need to know because that's about the third time I've been interrupted? can you/can we for'get about that for the moment/ OK there's children who are trying to learn and this stuff gets in the way/ I will talk about this 'after the science lesson so I want you to wipe it out from your mind/ would it help if Tufik moved or if Robert moved? would it help if one of you moved away from the other/ yes probably would/ maybe you Tufik/ here/ down in front of me please/ it will be easier for you to concentrate/you need to try/ I know it's difficult/ you need to try and 'put that 'out of your mind and concentrate on what's going on at the moment/OK /otherwise you're not going to be able to do your work when it comes time to do the next step (2:23i)

Though listing the comments on social behaviour in this way may give the impression that such talk was unduly prioritised, the overall effect was of a well-ordered classroom, where students were clear about behavioural boundaries and in general were willing to cooperate with each other and with the teacher. Because of these shared understandings about the social aspects of being a student, including a shared expectation of what constitutes appropriate behaviour, there were very few direct and extended admonishments such as the one above, with the result that the teachers were able to use more indirect means to maintain order and working relationships, and to direct activities. Direct imperatives are therefore rare; the more indirect means of control are typically realised by the use of modality (including what Halliday (1985b) refers to as interpersonal metaphors such as *I want you to*):

> (*to class who are engaged in group work and are becoming noisy*)
> excuse me <u>can I remind you</u> that <u>we should be using</u> quiet group voices/ if I want to be with a group of children I shouldn't know what's going on at the front of the room (2: 37)

> when I stop you /you need to focus your attention on em/ as soon as I stop talking you can go straight back to what you're doing/ I know it's difficult but I just want you to cooperate for this moment please (2: 12)

> Tufik (*chatting with neighbour*) would you just like to come up (*indicating spot in front of teacher*) I think this might be a better spot for your concentration/ what do you reckon?

Given that students from ESL backgrounds may not be familiar, in English, with aspects of register relating to politeness forms, there is a risk that this unfamiliarity may result in their being viewed as impolite or aggressive by their teachers and peers. It is significant, then, that both teachers spent time modelling specific wording for situations in which students might find themselves in the course of the group work. In reviewing an activity in which students had to share, in turn, a generalisation they had each written, and then collaboratively write three generalisations as a group, the teacher reminded children of how such negotiation might proceed:

> so someone might have said oh no, I don't agree with that/ and you had to say well this might be a better way of saying it (2:40)

In the instructions for a later group work activity, when children were to design a game which used magnets, the same teacher again focused on the nature of collaborative activity. Taking up a student's suggestion that this involved "communicating with your group", she discussed with students what this might mean, and provided models of specific wordings which students might need to use in order to come to a jointly shared decision about the design of their game:

> OK so it's a lot of . . first of all . turntaking . and quiet group work voices . and maybe sharing your ideas certainly/ oh an idea I have or one idea I have or a suggestion that I have/put it forward as a suggestion or an idea/ people will be much more . willing to listen to it . than if you say this is what we're going to do so be careful . with the sort of group work language that you use
> (2:42)

Patterns of interaction

The episode summaries indicate that a range of interactional patterns occurred. The major interactional patterns are briefly discussed here; their significance to the study as a whole is discussed in detail in later chapters. Four major types have been identified. The purpose of this coding of classroom interaction is to characterise the manner in which meaning is constructed in relation to the activity being undertaken; thus the coding is not at the level of a move by move analysis, but a summary coding at the level of the episode. The aim is also not to provide a rigid system of classification but to give an indication of the kinds of choices teachers made about how talk would be constructed in their classrooms. In addition, as van Lier (1996) points out, many pedagogical activities are 'hybrid' ones, in which aspects of several types of patterns are interwoven (for example, in the current study, a teacher may join the discussion of a small group, momentarily taking control of the discourse by virtue of her status, and so subtly altering the discourse by her presence).

The episode summaries indicate that when these interactional choices are mapped onto the description of the activities themselves (see *Teaching/ Learning Processes*), then each of the interactional patterns indicated is fairly systematically used for specific educational purposes. It will be suggested at several points in this thesis that linking interactional types to their *function* within the unit of work appears to offer greater potential in the description of pedagogical practices and teaching style, than describing them more generically as 'open' or 'closed' or as 'teacher-centred' or 'learner-centred', and making subsequent claims about the 'effectiveness' of each type. As discussed in Chapter 6, a more relevant issue is how appropriate the relationship is between a particular interactional type and the educational purpose it is trying to achieve at that point in the unit of work.

The four major interactional types which have been identified in the data are discussed below. They are listed along a cline from least to most participatory, from the point of view of the students; that is, from interactions which are the most asymmetrical in terms of the rights of participants, and where information is essentially one-way (such as teacher monologues), to interactions which are most self determined and symmetrical (such as small group work). The four types also represent a movement from most to least teacher-centred, and in terms of participant roles, from least to most equality.

This classification of interactional types as a cline towards participation draws on van Lier (1996), although there are some differences in the terminology used to

describe each type. Van Lier distinguishes four types of pedagogical interaction, which he describes not as a clear-cut system of categories but as a "map of pedagogical options" (van Lier 1996, p. 180). These he defines as *transmission*, which in classrooms is realised by a typical monologic lecture format, drills, and commands, the banking model described by Freire (1983); *IRF questioning*, where most commonly the direction of the discourse is determined by and familiar to the questioner; *transaction*, where information is exchanged by means of a two-way process, as in group discussions, information exchange tasks and other cooperative learning tasks; and *transformation*, which is jointly managed talk where the agenda is shaped by all participants so that meaning and events are genuinely co-constructed. While van Lier makes clear that he considers all four levels to be important in the classroom at different times and for different purposes, he argues that the transformative level is crucial and has been previously neglected.

The four types of pedagogical interactions which are referred to in this study are described below.

Teacher monologue

Teacher monologues refer to those points in the discourse where the teacher holds the floor without interruption. In these classrooms they are normally very short, varying between one and two minutes, and represent a one-way transmission of information and directives[2]. They refer to those times when the teacher did not seek to elicit verbal responses from the students. The episode summaries indicate that they are used mainly for setting up tasks and giving instructions (see for example, 1:5; 1:9; 2:10; 2:15; 2:18; introducing new language items (1:8; 1:12) and occasionally for disciplinary purposes (2:23).

IRF

As discussed earlier , the 'Initiation, Response, Feedback' exchange displays a triadic structure, and was first identified as a dominant form of classroom discourse by Sinclair and Coulthard (1975), and later by Mehan (1979) who refers to Initiation, Response, Evaluation, and Lemke (1990a) who describes such exchanges as "triadic dialogue". Other researchers have also described this exchange as being a highly significant and pervasive one in classroom talk (see for example Barnes1976; Edwards and Mercer 1987; Cazden 1988; Wells 1993; Mercer 1995;

[2] It can be argued that even 'monologic' discourse is never truly so, since there will always remain 'traces' of previous talk (see Bakhtin 1981; Maybin 1994).

van Lier 1996). Stubbs argues that the IRF structure is not the only exchange type possible, but is characteristic of classrooms and "provides a way of formalising a mechanism by which one speaker ... retains the conversational initiative" (Stubbs 1986, p. 164).

Later chapters will show that the IRF structure can be considerably modified to achieve greater participation for students. Van Lier, in addressing the criticisms against the IRF structure, notes that "it is important to emphasise that [these criticisms are] neither a necessary or an exclusive consequence of the IRF structure, merely that this structure may favour this state of affairs" (1996, p. 151). He presents an in-depth analysis for the IRF structure which includes identifying exchanges along a display-participation orientation, and points out that this orientation has important consequences for students' motivation and for the possibility of "opening up the IRF into more mutually contingent interaction" (van Lier 1996, p. 154). However, for the purposes of this study the term IRF is used in a more restricted sense, and is limited to describing the traditional three part exchange where the purpose of the interaction is primarily oriented towards the display of students' knowledge. (More participatory forms of discourse are also described below, but are distinguished in their labelling from IRF). In this study, in the exchanges described as IRF, the teacher expects a particular response from the students: she is, in terms of the exchange structure, the 'primary knower' (Berry 1981).

The following is an example of a typical IRF interaction:

T:	what if I try the north pole and the south pole of the magnet/ who can tell me/ I want a sentence a nice sentence/ Carole Ann?
S:	the north pole and the south pole attract
T:	good
(1: 17)	

Van Lier describes the student's response in this kind of IRF sequence, as "hemmed in, squeezed between a demand to display knowledge and a judgement on its competence" (van Lier 1996, p. 151). In the three part exchange students' responses are evaluated or examined publicly, rather than treated as a part of extended conversation. Lemke is similarly critical of the overuse of the IRF structure, arguing that the effect it gives of participation is illusory:

> it tends to lead to brief answers from students and lack of student initiative in using scientific language. It is a form that is over-used in most classrooms because of a mistaken belief that it encourages maximum student participation. The level of participation it achieves is illusory: high on quantity, low on quality.
> (Lemke 1990a, p. 168)

Lemke also points out that this interactional pattern makes it difficult for teachers to hear how students talk about a topic, since most of what students say tends to fit, or be made to fit, into the thematic pattern set up by the teacher, and thus "students have little opportunity to make semantic connections in their own terms" (Lemke 1990a, p. 32).

However, as van Lier also points out, this restricted IRF structure may sometimes facilitate the role of the student: the teacher's question may offer strong clues about the kind of response that is required, while taking part in a less structured conversation may also be daunting for a student who then has to work out not only what to say but how to handle turntaking processes: "the IRF essentially strips the work of turntaking and utterance design away from the student's contribution, and this obviously has advantages as well as disadvantages"(van Lier 1996, p. 152).

As the episode summaries indicate, in these classrooms IRF interactions occur most frequently at two points in the macrogenre. They occur in the giving of instructions (the 'set up' stage), often after a teacher monologue when teachers check that students have understood the task (see for example, 1:5; 1:13; 1:21; 2:4; 2;11). They also occur very commonly at the end of the 'reflection' stage, thus at the end of each macrogenre when teachers are checking that the knowledge which has been built up, is now shared (see for example 1:8; 1:17). A similar point is made by Edwards and Mercer (1987) in their discussion of teachers' use of speech in unison. Sometimes the IRF interaction at this point is a cued elicitation, when teachers provide most of the propositional content and students are required to provide a single key term (see for example 2:29 and discussion of text 6.6). IRF interactions are also used when the teacher is focusing on a specific linguistic structure or grammatical correctness (see for example 1:8; 1:15 and discussion of texts 6.18 and 6.19). Again this occurs towards the end of the macrogenre, when the students have already developed some understandings of the topic and built up field knowledge. IRF patterns, in the way they have been defined here, are much less commonly used at other times.

Dialogic exchanges

Dialogic is used here to refer to the kind of transactional exchanges in which the discourse is determined through the contributions of both participants. It remains, in one sense, IRF-*like*, in that there is an external agenda imposed by the teacher, and the process of the discourse continues to be controlled and maintained by her. For these reasons the discourse cannot be said to be symmetrical. Nevertheless, it represents a departure away from traditional teacher-controlled IRF structures in that it allows the voices of students considerably more freedom, and often leads to extended sequences of discourse between students and teacher.

Dialogic interactions occur most commonly in TGR episodes, where although the teachers maintain the overall thematic development of the discourse as a whole, students very frequently initiate the topic of individual exchanges. These interactions are discussed more fully in Chapter 6, and their significance for second language learners is discussed in Chapter 7. Here an example is included as exemplification.

T: Maroun/ something that you can tell me that you found out last lesson
S: Miss I thought that all metal can stick on magnets but when I tried it some of them didn't stick.
T: OK so you thought that no matter what object/ if it was a metal object/ it would be attracted to the magnet
(2:15i)

While this interaction retains some of the characteristics of the IRF pattern (the teacher for example has the first and last word) it differs significantly in two ways, both of which relate to an increase in what is referred to in Chapter 2 and in Chapters 6 and 7, as the *contingent responsiveness* of the teacher.

First the teacher's question which opens the exchange is a genuine one. As described earlier, TGR sessions followed those episodes where groups of students had carried out different experiments, and hence when they reported back the results they were reporting what was unknown information to most of the audience, (including, in terms of the detailed events, the teacher). Although of course the teacher has knowledge of the experiments and the likely results, it is left open to the student to decide what aspect of the topic they will talk about. The degree to which the student is allowed to initiate the topic of the individual exchange represents a

departure from the teacher-prescripted responses associated with the IRF structure. In many TGR sessions, teachers did not repeat their first move once the session had begun, simply nominating children to contribute to the discussion, creating discourse with a more conversational feel.

The second, and related, way in which dialogic interactions differ from IRF interactions lies in the nature of the teacher's response. The teacher frequently recasts what the student has said: student meaning is recast or reformulated into more registrally appropriate wording (note the teacher's recast of *stick* to *attract* in the example above). Thus the modelling the teacher provides occurs after, and on the basis of, what the student has contributed: it is semantically contingent upon it. The teacher, in comparison with her role in the IRF structure, 'leads from behind' in a way which parallels a caregiver's response in early first language learning, (described in Halliday 1975; Painter 1984; Wells 1985 and discussed in Chapter 2). Compare, for example, the text above with the following text from Donato and Adair-Hauck (1992, cited in van Lier 1996) which comes from a language teaching classroom, and where the IRF pattern creates strong constraints on what students can say:

C [teacher]: Yesterday, today, next year (*on board*). What are these?
S1: Time expressions
C: Yes, time expressions. What is the date today?
S2: April 16
C: And yesterday?
S: April 15
(Donato and Adair-Hauck 1992, p. 81)

Unlike the IRF sequence, which frequently closes off the exchange, and sandwiches the student's contribution between the two controlling moves by the teacher, dialogic interactions have the potential to build up to a discourse sequence and hence to open up the discourse in ways which, Chapter 7 will argue, are likely to be enabling of second language development.

It can be seen that the use of the term *dialogic* in this way is essentially a textual one, and differs from the ideological and moral interpretation it has for some critical theorists; for Freire for example, 'dialogic' discourse represents an instrument of liberation which is transformative in its goal of working against societal injustices. The use of the term in this study is closer to the textual definition of Bakhtin (1981), which emphasises the relatedness and interplay between the utterances of different speakers. Nevertheless, it will later be argued that dialogic interactions do have an

ideological interpretation: they create opportunities for students' voices to be heard, and construct a more effective and equitable learning environment for minority learners. Chapter 6 characterises the role of the teacher in such interactions as one of mediation rather than transmission: she mediates between the personal ideas and everyday language of the student and the subject knowledge and 'public' discourse of the curriculum area.

Participatory exchanges

Although all the discourse in the classroom is participatory in one sense, even if *students are only required to listen, I use the term here to refer specifically to talk in* which the agenda is shaped by all participants, and is thus truly co-constructed. It is characterised by symmetry of participation rights and self-determined contributions to the discourse, and relates to Lemke's description of "true dialogue" and "cross discussion", which he describes as "the two rarest activity types" (Lemke 1990a, p. 55), and to van Lier's description of "transformation" (van Lier 1996). "True dialogue" occurs when teachers ask questions to which they do not presume to already know the answer, and "cross-discussion" is dialogue directly between students, with the teacher playing only a moderating role or having equal standing with the students (Lemke 1990a). Van Lier (1996) writes of discourse which embodies the notion of "'transformation" in these terms:

> Transformation [is] jointly managed talk that has the potential to change learning situations, role relationships, educational purposes and procedures. Here it is no longer the case that one person, the teacher, has the agenda, and the students have no option but to follow it ... participants' contributions are self-determined or produced in response to others' requests. At this level it is appropriate to speak of true co-construction of meanings and events.
> (Van Lier 1996, p. 180)

Although truly participatory talk is probably rare in most classrooms, many of its characteristics can be found in small group work. In the current study, for example, group activities are participatory in the sense that participants have equal participation rights. However, even here the overall agenda has been set by the teacher, not by the students. Nevertheless, in that (within the constraint of an externally imposed agenda) students' contributions within the group are self determined, and participation rights are shared equally, talk between students in group work is described as participatory.

Much more rare in this corpus is truly participatory and discursive talk between teacher and students. Participatory talk is by its nature democratic with regard to participation rights. Yet by virtue of her authority and knowledge, it is unlikely that in a classroom context teacher and students will have equal power and knowledge status within the discourse. As Lemke (1990a) points out, power differences bias the tenor away from a free discussion of issues between equals. Such a situation is not impossible however, and can occur when students are in a position of expertise or where expertise (or non-expertise!) is shared equally. The early days of computer use in the classoom, for example, created many situations when students had a greater expertise than their teachers (and probably this is still true today). In this study, given the nature of the topic, there are few examples of such student expertise. However Classroom 1 provides evidence that when a genuine problem or disagreement arises, more participatory talk between teacher and student may occur. The following two texts exemplify this.

On one occasion, two students (George and Ramond) disagreed with the teacher's explanation that the reason for a screw being non-magnetic was that it was made of non-magnetic material. They both argued that this could be the result of galvanisation and the teacher, although still maintaining her argument, was, (on her own admittance), unsure of the correct interpretation, and the discussion continued for some minutes. In this text, following the use of this technique by Edwards and Westgate (1994), the contributors are not named, so that the teacher is less obviously conspicuous. Here the address terms are also omitted. With these markers removed, and although it is still possible to identify the teacher, the nature of the discourse means that it is far less obvious which contributions are hers, since all contributors initiate ideas:

- magnets only stick to some kinds of metals
- only some metal
- yes
- only some
- I think I know why the magnet got to steel on top of the wood but not to the/ stuck to the other stuff/ cos maybe its chemicals are too strong/ too strong for the magnet
- you mean than this?
- what do you think?
- on this
- yes maybe what they put on it is too strong for the magnet

- I don't think so/ I think that the reason is what Rana and the other people thought that this is a different kind of metal
- it is
- so that magnets don't attract all metals/ right one more thing before we start
- I think it/ it/ it's the same colour but when they dipped it/ dipped it in/ in different things
- it's the same colour/ you mean it's the same metal?
- the same/ I think it 'was the same but they dipped it in something else
- well that's what George was saying/ and I think that we're arguing that it/ no/ that it 'is another metal

(1:11)

The teacher's control of the discourse is clearly suggested at one point, when the regulative register is foregrounded: *one more thing before we start,* and also by the fact that she exercises her right to say what other participants said or meant. However it is far more difficult to identify the teacher simply from the *amount* that she contributes or from any other realisations of the regulative register. This text thus comes close to 'participatory' discourse between teacher and students.

A second example comes from the same classroom. Once more it is George who initiates the topic. After the science lesson on the previous day, which was the last period in the afternoon, he had remained after most children had gone home to explore the magnets further. During the science lesson he had carried out the following experiment. A number of wooden paddle pop sticks were inserted into a block of polystyrene, sufficient to surround a bar magnet which was inserted into this 'cradle'. A second bar magnet was placed above the first. With like poles together, magnetic repulsion causes the top magnet to appear to be floating above the cradled magnet. After the lesson ended George repeated the experiment with four magnets, alternating the poles of each one. This did not result, as might be expected, in equal amounts of repulsion between each magnet. Instead, the bottom two magnets were in contact, there was a small amount of space between them and the third magnet, and much more between the third magnet and the fourth. In the science lesson the following day, the teacher asked him to demonstrate what he had done, and the children, fascinated by the result, offered many explanations for the behaviour of the magnets. The transcript below again has many of the characteristics of participatory discourse: it is particularly significant that all the suggestions come from the students. As in the previous example, speakers are not named. Here George has just demonstrated what he had done earlier.

- he's going to do two
- three
- doesn't go up
- put it soft George
- they've all gone down
- all gone down
- does anybody want to make any comment about that?
- why did
-we need to be very quiet and listen to what C's saying so we can make some comments
- I think because there's too much more * down
- sorry say that again
- there's too much to hold it
- too much what?
- em like/ there's too much of the/ north
- too much of the north
- the side of the magnet/ of the north
- the magnet at the top pushes/ pushes the magnet down on the top
- down
- keeps it together

(several minutes later)

- what's this magnet doing?
- it obviously is repelling there's no doubt about that
- I think because you know how they repel from each other
- they're what?
- repel/re... yes the one at the bottom/ the one at the top has a lot of power and it's repelling it/pushing it and it and it's pushing down the bottom
- this one is repelling this one and then you say/ you mean it's a lot of power?
- yes and that's repelling
- and you think that that's causing these two to come together
- I think the top one is repelling that one there and
- repelling the second one
- yes and that the sec...
- second one
- is repelling the
- third one and the third one is repelling the
- fourth right/ but why then do we have this big space and we have a little space and no space/ I don't know/ I don't know either
- I think the top one's got more power

- so what's causing this to go down further
- I think that's it / the way that em the third one has/ and the other one that em has a big space that's between it is repelling the sec/ the third one
- this one has nothing on top of it to =
- yes
- = to make anything repel
- yes so it's not gone down
- I think that the top one has * to repel and the second one doesn't want to go down and the first one
- so you believe it's just the different weights on there? I/ I mean I'm not really sure
- something's making the space here
- that's what I'm wondering

(1: 18)

The degree to which meanings are being jointly constructed is evident from the way in which participants predict and complete the utterances of others. It is of course possible to identify some of the teacher's contributions: there is the occasional use of the regulative register, and she, more often than the students, clarifies students' meanings. Despite this, this piece of discourse, like the previous text, is strongly oriented to student participation.

It is perhaps unrealistic to expect that truly participatory discourse can regularly occur within a whole class situation, (nor, it is later argued, would it always be desirable). A 'conversation' among thirty people is a virtual impossibility, at least within western culture, and hence many teachers' reliance on small group work in the classroom to extend participation rights. However these two texts illustrate that even when the teacher continues to maintain some control of the discourse by, for example, nominating speakers or taking responsibility for clarifying meaning, it is possible to approach some symmetry of participation. Students are here free to express individual thinking, and to interpret the situation according to their world view and experiences. No one is the 'primary knower' and all ideas are accepted as valid and are listened to and treated with respect. (The seriousness with which Penny treated all contributions, even in more structured discourse, was a feature of all her interactions with students.)

If these final two texts are compared with the earlier examples of IRF interactions, we can see how far teachers are able to extend the range of discourse roles within educational talk, even within the social and institutional constraints of the

classroom. This theme is explored throughout the study. As the episode summaries indicate, in the two classrooms studied there are regular and extended opportunities for students to participate more fully than traditional classroom talk typically allows.

These issues are developed further in Chapters 6 and 7.

Mode shifting

The term 'mode shifting' is based on Martin's construct of mode and the mode continuum (see Chapter 3), and is used here to describe shifts in movement along the mode continuum, from more spoken-like discourse to more written-like, and vice versa. The episode summaries show the kinds of activities that lead to this movement. Sequences of episodes produce discourse which can be plotted at points along the continuum. From one episode to the next, tasks within each macrogenre move overall towards the use of increasingly decontextualised language: language is 'shunted' along the mode continuum. Since mode shifting is the theme of Chapter 5, only a brief discussion is included here.

The need for second language learners to begin language learning with the support of the 'here and now', and the difficulties they may experience with less context embedded language, has already been discussed in Chapters 1 and 2. Identifying some of the contexts in which this aspect of second language development is addressed in the classroom is thus critical for effective ESL teaching. In addition, such identification can illustrate how the theoretical and linguistic construct of the mode continuum may be operationalised as a pedagogical tool.

Mode shifts *within* episodes often occur in the process of dialogic interactions, where teachers recast student wording into more registrally appropriate (or more written-like) wording. Typically this occurs in TGR episodes. It also occurs in those contexts where students have simultaneous access to more than one language source. This is the case, for example, when they use their individual written notes to share information orally with a partner, or when the teacher, while responding to students' oral responses, also writes these on the board. A 'reverse' mode shift — from more to less decontextualised — also occurs in a situation which occurred several times, when the teacher refers to the written instructions which the students will later use to carry out an experiment, and at the same time 'explains' the instructions in more familiar everyday language, often accompanied by demonstration:

(*reading from instructions*) "Place a magnet into the cradle, and place another magnet on top of the cradled magnet" so you've got one magnet in here (*demonstrating*) then you have to put another magnet on top (*demonstrating*)
(2:18)

In order to make the written instructions comprehensible the teacher here switches between more formal language (*place)* and a more everyday usage (*put*), at the same time creating meanings through gesture and demonstration. This reveals the complexity of the notion of 'comprehensible' input, an aspect of second language learning which is discussed further in Chapters 5 and 7.

As has already been mentioned, mode shifts *between* episodes are particularly significant. For instance, students who have been involved in a group activity are later asked to report on it; or individual results are shared with a group and then recoded as generalisations. When such mode shifts occur, they are always scaffolded by the teacher, typically through the dialogic interactions in the TGR episodes. Similarly, before students are expected to write, they are given the opportunity to 'rehearse', through talk within the group, what they will write about. There is therefore a strong relationship between mode shift and particular interactional structures, with instances of mode shift often involving the teacher taking on the role of 'mediator' between students' local and personal knowledge and the public language and knowledge of the subject. An additional point in relation to the sequence of activities is that, in following a teaching and learning sequence where students move *towards* the target language, (rather than *starting* the unit with the teaching of new grammar and vocabulary), teachers are effectively reversing what has often been common in the practice of language teaching.

As the episode summaries indicate, many of the episodes where spoken language plays a major part, in particular those referred to as dialogic, involve the students reconstructing prior experiences through language, in contexts where the information may not be known to others (see for example the references to teacher-guided reporting in the episode summaries). The significance of this from a linguistic perspective was noted in the discussion of the systemic model of language in Chapter 3. Halliday (1993, p. 102) refers to the emergence of information in mother tongue development, the ability to "impart meanings that are not already shared by the person addressed", as a significant feature of first language development. As argued earlier, such a developmental stage is at least as critical for second language

learners as it is for first language learners, and, given the relatively short time frame in which they must learn to use more academic registers, probably more so. The episode summaries indicate that the imparting of 'unknown' information was a feature of the language demands placed on the students by many of the classroom activities and participant structures, as for example, when groups shared the results of experiments which their peers had not taken part in.

The intertextuality through which episodes are constantly related allows both learners and teachers to build up together a shared frame of reference. Thus while it can be argued that discourse is constantly related to context, the notion of 'context' here does not apply only to an immediate situational and static context, (which is often a major focus for ESL teaching and implies the notion of 'setting'). It applies also to the dynamic context which has been created by the class through their shared and ongoing participation and reflection on the activities. This shared history forms the basis and a shared point of reference for new language learning, which then proceeds on the basis of these common points of reference. Intertextuality in relation to the notion of context in second language teaching, and the implications of this for notions of comprehensible input and for practice, are discussed further in Chapters 5 and 7.

The themes identified and introduced in this chapter have been drawn from the corpus summary represented by the two episode summaries. These themes are now taken up in the following three chapters.

CHAPTER 5

Teachers and Learners: Constructing New Meanings

In teaching science ... we do not want students to simply parrot back the words we have said. We want them to be able to construct the essential meanings in their own words, and in slightly different words as the situation may require. Fixed words are useless ... If you can't say something in more than one way, you have only memorised it. You can only use it flexibly, if you can get past a set of words to a meaning.

(Lemke 1990a, p. 170)

INTRODUCTION

It has been argued that the degree of context embeddedness of language is a factor in determining its comprehensibility for ESL learners, while decrease in context-embeddedness is typically a feature of the academic registers which they must learn to control in the school context. Clearly there are implications for a teaching program, which must provide opportunities for learners to develop this register of language, with the aim of "progressively freeing the system from a dependence on situational constraints" (Halliday 1975, p. 142). This chapter will explore how such mode 'shifts' were actualised in the classroom and how the notion of a mode continuum offers a way of analysing how the teachers in the study developed new registers with their students. By tracking the activities and organisational structures in which the texts were produced it also illustrates how the notion of the mode continuum can be operationalised for language teaching purposes.

The episode summaries indicate that different activities varied in the demands they made on students' linguistic resources: thus at times language accompanied action, as in the group experiments; and at times tasks required students to give information through language alone, as in the teacher-guided reporting sessions.

Instances of mode shift can be examined in terms of the 'micro' discourse context and the 'macro' discourse context. Here 'micro-context' refers to the exchanges that occur between teacher and students in the course of a single conversation *within* one particular episode. Part 1 of the chapter explores this aspect. The 'macro-context' refers to the mode shifting which occurs *across a sequence* of episodes. Texts from a sequence of episodes will be examined to show how the discourse of the episode as a whole develops out of the discourse of a previous episode, and how it also provides a shared frame of reference for the discourse of the following episode. In this way it is possible to track how a sequence of episodes is structured in such a way as to lead to the use of increasingly more context-free language. Part 2 of the chapter discusses this aspect of mode shifting.

Although, as will be suggested, the distinction being made here between micro and macro mode shifts is a useful way of exploring the data, such a distinction is considerably less obvious in the reality of the classroom. Indeed it will become clear that the texts examined as examples of micro mode shift (for example, texts taken from the teacher-guided reporting where the teacher recasts student wording) contain many 'traces' of previously shared experiences and earlier

discourses. For talk is not produced and heard in a vacuum, simply in the immediate context of the discourse in which we are engaged, but, at least in successful interaction, is located within larger understandings which are shared by interactants. And it is precisely this building up of shared understanding and shared discourse that is a particular feature of classroom talk (Edwards and Mercer, 1987).

PART 1: MODE SHIFTING IN MICRO-EXCHANGES

This section illustrates and discusses situational contexts where the discourse produced by the teacher, or between teacher and student, encapsulates a mode shift. Often this also involves a shift from everyday to specialised lexis.

A common context for mode shifting in this data was teacher-guided reporting (see for example Classroom 1: 7, 11, 16, 18, 23, 27; Classroom 2: 14, 23(i), 25, 31). In these interactions teachers frequently responded to students' meaning through recasting their contributions into a more scientific register, usually encapsulating a field shift. As discussed in Chapter 4, a significant factor in this discourse context is that the students initiate the topic of the exchange, and so teacher recasting is a response to student-initiated meaning. A similar situational context occurs when students are involved in small group work, and the teacher briefly visits each group in turn to ask them what they had found out. Texts 5.1 - 5.4 in this chapter exemplify these contexts, and are glossed as *Recasting by the teacher.*

Both teachers also used some metalanguage with the students to make explicit the fact that they were learning to use a new register; for example they frequently referred to 'talking like scientists'. Though not in itself an actual instantiation of mode shift, this use of metalanguage brings to students' notice, and gives them access to, the kinds of linguistic resources they need in order to *use* the register. Texts 5.5 - 5.10 illustrate this, glossed as *Making the new register explicit.*

Often, rather than recasting student wording, teachers simply prompted students to reformulate what they had said themselves. Frequently this prompting drew on the metalinguistic knowledge that the teacher had built up with the students and they were able to produce the new wording alone. Texts 5.11 - 5.13 are examples of this, glossed as *Reminding and Handing Over.*

In this data, mode shifting also occurred in a reverse direction, as a move towards less context-reduced language, when for example the teacher 'unpacked' written instructions. These examples are linguistic instantiations of how input can be made comprehensible to learners while new linguistic input is still provided. Texts 5.14 - 5.16 illustrate this, glossed as *Unpacking written language.*

While these headings represent the kinds of mode shifts that occurred in these data, they should not be read as suggesting that all instances of mode shift in classrooms could be described in this way. One obvious and additional context, which did not occur in this data set, would be situations where interactions take place around the reading of written texts. A study of mode shifting in such contexts would offer valuable insights into its role in mediating the use of literacy tools. The focus of this study, however, is the less well-researched area of spoken discourse.

Recasting by the teacher

The texts in this section (5.1-5.4) illustrate how a student's contribution is recast by the teacher into more register appropriate wording, or what Lemke refers to as a "foreign 'register' within English" (Lemke 1990a, p. 172).

Text 5.1
Classroom 2: Episode 15

Context
This text occurred during a reporting session with the teacher after the students had taken part in small group work where they experimented with magnetic and non-magnetic materials.

	STUDENTS	TEACHER
1		Maroun/ something that you can tell me that you found out last lesson
2	Ma: Miss I thought that all metal can **stick** on magnets but . . when I tried it some of them they **didn't stick**	
3		OK so you thought that no matter what object/ if it was a metal object it would be **attracted** to the magnet/ interesting . Milad?

4	Mi: I thought I thought that em the metal coins **stick** onto the magnet . . it wouldn't I put it near it and it **didn't got stuck** onto it	
5	Mi: no	OK it 'was **attracted** to the magnet? it wasn't OK good/ Fabiola?
6	F: em em I thought that em the . . . em . . Miss what was the object that em could st . . ? em like . . the coin could **stick** onto the magnet but it wouldn't	
7		OK you you predicted that it did/ it would be **attracted** to the magnet and it wasn't

Text 5.2
Classroom 2: Episode 18

Context

Here the teacher is talking with a small group of students and asking them about the behaviour of the magnets they are experimenting with. The activity demonstrates that like poles repel.

	STUDENTS	TEACHER
1		what happened?
2	the the magnets/ there's one magnet here and when the the em power. comes down and gets powerful it it . . stays on the/ on the . . .	
3		so what's this magnet trying to do . . to that one?
4		
5	it's trying to **lift it up**	
6		OK it's **repelling** isn't it/ it's **not attracting** like it did the other way. that magnet's **repelling**

Text 5.3
Classroom 2: Episode 23

Context

This occurred during a teacher-guided reporting session following experiments designed to show that like poles repel and unlike attract.

	STUDENTS	TEACHER
1		what were your 'results
2	when we put it on one pole . . em faces the other one it doesn't stick but when we turned the other one around . it **sticks** together	
3		OK can I just clarify something? you've got two magnets? they're in line/ when you put. the two together
4	yes Miss	
5		like that (*demonstrating*) they **attracted** to each other/ they stuck to each other/ is that right?
6	(*nods*)	OK can you then tell me what you had to do next. ?
7	when we had em the things the first one like if you put it up in the air like that . the magnets you can feel . feel the em . that they're **not pushing?**	
8		when you turn the magnet around? you felt that
9	**pushing** and if we use the other side we can't feel pushing	
10		OK so when . . they were facing one way . . they/ you felt the magnets **attract** and stick together/ when you turn one of the magnets around you felt it . '**repelling** . . or pushing away . . OK thank you well done Charbel
	(child sighs and smiles and appears pleased he has communicated successfully)	

Comment

In each of these three sections of the discourse, the teacher's recast version is thematically related to the students' version, even though different thematic items are used: *stick/attract; lift up/repel; not pushing/repelling*). The same semantic relations are constructed and the same thematic pattern is repeated: *they stick together/ they attracted each other; you can feel they're not pushing/ you felt it repelling.* In describing one of the ways in which science teachers build up basic semantic relationships for thematic development, Lemke refers to a teacher's use of 'local equivalence', whereby two expressions are marked as equivalent within the thematic pattern being built up. Lemke describes how the teacher places both words in a "parallel environment", meaning that the words and expressions to be

marked as equivalent (or perhaps as in contrast) occupy the same or corresponding 'slots' in a similar or identical grammatical construction (Lemke 1990a). In the example above, the teacher's response follows closely the grammatical construction of the student, and the discourse to which both teacher and student contribute constructs this parallel environment. This is close to what Lemke refers to as "the strongest parallelism", which has exactly the same words preceding or following the contrasted or equated ones. Later in the topic however, as Part 2 of this chapter will show, teachers recontextualise students' earlier contributions to the discourse somewhat differently, by using different wordings and grammar.

In each of the texts the teacher recodes students' 'every-day' wordings. These student wordings (*stick; lift it up* ; and *pushing/ not pushing*) are accepted by the teacher. By responding to the meaning of what students are saying, she allows for communication to proceed, while at the same time her response recasts these meanings as *attract* and *repel*, and so gives the learner access to new linguistic data. This recasting and extension of student initiated meaning depends on the adult's contribution being closely related to, and thus following, the student's contribution. In Chapter 4 this was discussed as the teacher 'leading from behind'. While following the learner's lead and accepting as a valid contribution the information given, she at the same time provides alternative linguistic forms to encode the learner's meaning in more context-appropriate ways. In this process new meanings are collaboratively developed. The teacher's responses suggest the Vygotskian notion of the ZPD: the teacher takes as a starting point what the student is able to contribute, but scaffolds the language they will later be expected to use. Focusing on the role of the adult in early first language development, Wells (1981) points out that adult contributions to discourse must be modified in timing, form and content to the child's receptive capacities, but at the same time they must provide the means for the child to increase their linguistic resources and, through these resources, their understanding of the content of the communication. These texts show how the same process can occur in classroom interactions. It is worth considering how the interactional context is set up so that such interactions are likely to occur.

What is similar in each of the examples is the initial move by the teacher:

Text 5.1: Maroun/ something that you can tell me that you found out last lesson

Text 5.2: what happened?
Text 5.3: what were your results?

In all three examples, the teacher invites the student to give information which she (the teacher) does not already possess. The students are the 'primary knowers' (Berry 1981) in that they possess specific information (what happened in their group work) that the teacher does not have. Although of course it is the teacher who is in control of the knowledge associated with the overall thematic development of the unit of work, such initiating moves temporarily locate that control in the student, which sets up a context where students are able to be the initiators of the specific topic of the exchange: they enter the discourse on their own terms. This issue is taken up further in Chapter 7.

In text 5.3, the teacher's questions lead to an opportunity for her to model both *attract* and *repel* in turn. She begins by asking about the results of the experiment, which the student then describes in a single turn. The teacher responds with *can I just clarify something* (3) even though the information that Charbel has given is apparently adequate as a response to her initial question. She appears to want him to describe each step in turn, asking *can you tell me what you had to do next* (6). As he responds by retelling each part of the experiment, describing how he held the magnet first one way and them another, an opportunity is provided for the teacher to focus first on *attract* (5) and then *repel* (10). It is worth noting however that the shift between commonsense and technical here is not a simple linear process. If we focus simply on the teacher's contributions, it can be seen that they include instances of three distinct 'points' along the spoken-written (mode) continuum, representing in each case what is essentially the same propositional content. These can be characterised as 'formal', representing the standard lexis of school science; 'everyday', representing the informal spoken language familiar to the children; and 'context embedded', representing those parts of the discourse which contain exophoric reference and are bound up with and rely on the immediate and visual context. There is therefore considerable message redundancy operating here through the modal shifts. Figure 5.1 illustrates the mode shifting by which this redundancy is achieved.

Fig 5.1 Mode shifting

STUDENT	TEACHER *(Formal)*	TEACHER *(Everyday)*	TEACHER *(Context embedded)*
it sticks together			like that *(demonstrating)*
	they attracted to each other		
		they stuck to each other	
you can feel . . . that they're not pushing . . . if we use the other side we can't feel pushing			
	when they were facing one way you felt the magnets attract		
		and stick together	
	when you turn one of the magnets around you felt it repelling		
		or pushing away	

The mode shifts evident in the teacher's discourse when it is examined in this way offer a micro-perspective on the way in which the discourse operates as a linguistic bridge between students' current language abilities and the demands of the school curriculum, (a process characterised in Chapter 6 as mediation). Exploring the mode shifts within the discourse also offers a linguistic perspective on one way 'comprehensible input' may be achieved, a point which is taken up further in Chapter 7.

Text 5.4
Classroom 2: Episode 32

Context

In the following example of recasting, the teacher recodes the student's contribution by foregrounding the point of comparison between larger and smaller magnets

STUDENT	TEACHER
big magnets are powerful	
	OK Mary/ do you just want to extend on that/ when I was up the back you were talking about that/ can you repeat what you said then?
em bigger magnets are stronger and small magnets are less stronger	
	OK/ so two people said that the bigger the magnet the stronger it is

Comment

From the point of view of second language learning, it is important to note that in the examples above the more unfamiliar lexis which the teacher introduces, occurred at a time when students had *already* developed some understanding of the topic of the interactions (that is, they had begun to develop their own thematic patterns). Thus learners are given access to the more unfamiliar register in the light of the schematic knowledge they have built up by taking part in the activities. It follows that a teacher in this context is potentially able to use aspects of the lexico-grammar beyond what might be understood if learners had not first taken part in the small group experiences, and were without these as a basis for interaction and interpretation. The teaching of new language at this point in a sequence of episodes suggests some parallel to the principle within bilingual programs, which suggests that learning should occur first in L1 as a basis to learning in L2; here, though, the relationship is between different registers (from familiar to new register) rather than between different languages (from first to second language). As Lemke points out, the learning of science language represents the learning of a 'foreign register', and so students are, in effect, "learn[ing] 'bilingually' in both colloquial and scientific English" (Lemke 1990a, p. 172).These points are taken up further in Chapter 7 in the discussion of discourse contexts for second language development.

Making the new register explicit

Lemke (1990a) argues for the explicit teaching of scientific language, including the use of metadiscourse or metalanguage. The following texts show how the teachers talked about the language to which children were being introduced, and how this occurred in the context of actual language use.

Text 5.5
Classroom 1: Episode 8

Context

In this text the teacher is introducing the lexical item *attract*. This term is introduced after the students have used a less formal register to describe their findings, a fact which the teacher acknowledges by saying that the students had *told me and explained it well.* She is standing at the blackboard and writing as she speaks.

TEACHER

I'm going to help you with a word today . that we didn't . . . no one has said/ because remember we're scientists . and we need to use the proper words . all of you 'told me . and explained it very well/ now we're going to learn the proper scientific words for this . what happens is . that magnets at'tract (*great emphasis*) . certain things and so rather than say that it grabs it or it sticks to it . what we say is magnets at'tract and that means . this kind of thing (*demonstrating*) so if I . am a magnet and I attract . Carol Anne/ I . . 'bring 'her 'to 'me (*demonstrating*) . attract . so I'd like for us to think of the other things . that the magnet at'tracted (*writes 'attracted' on board*) and then think of the things that the magnet . didn't attract . . that didn't attract (*writes 'didn't attract' on board*) and I'd like for you to say it in a sentence so we get used . to our proper scientific language.

Comment

In this text, the teacher is introducing to the students a new lexical item to express their findings. As the new word is introduced to students, the teacher makes clear that this is not the 'correct' way to express the findings — indeed she acknowledges that the children have already explained it very well — but rather it is the *scientific* way, that is, the appropriate way, to express them. The purpose of the learning is thus made clear to the children. The teacher tells them to *remember we're scientists,* and so we're going to learn *the proper scientific words* and get used to *our proper scientific language.* This emphasis on appropriacy rather than on formal correctness is intrinsic to a model of language which has as a fundamental principle the notion that language varies according to context and purpose, and here this notion is being made explicit to learners. By validating the students' original contributions, the teacher is presenting science, in Lemke's terms, "as one way of talking about the world among others" (Lemke 1990a, p. 125).

As was the case with the previous texts, the introduction of this new lexical item comes after the experiential work the students have been involved in, and after students have come to understand a new item of knowledge through their everyday register. New learning is therefore linked to current understandings: previous

conceptual understandings provide a 'peg' on which to hang new linguistic knowledge.

The fact that the teacher also writes the word on the board, creating a multi-modal context for her teaching, gives the new item added significance (Baynham 1996), and provides a visual reminder of the mode shift that is the theme of this piece of discourse.

Text 5.6
Classroom 1: Episode 8

Context

This occurred in the same stretch of discourse as the previous text.

> TEACHER
> OK . . now . . . could I just have us say it . because I want to make certain that we can/ we can talk like scientists . so if I point to something I'm going to call on people and see if we can just say it in sentences properly/ I'll start/ the magnet attracted . the nail . / the magnet 'didn't attract the plastic top

Comment

The teacher here focuses on the use of *attract* in the context of a clause, showing how the new lexical item is conceptually and linguistically incorporated into the new register. Again the use of this register, and the purpose of the activity which the teacher is explaining, are made explicit — to *talk like scientists*. The teacher gives a model of the lexico-grammar she wants the children to use, and which the children subsequently repeat in an extended piece of discourse (see Chapter 6, Text 6.18, for a full analysis of the discourse from which this text comes).

Text 5.7
Classroom 1: Episode 15

Context

This occurred in a similar context as the previous text, after the students had carried out experiments, and immediately before they were asked to report their findings to the whole class.

> TEACHER
> now I'm going to give you another word for what Joseph was trying to say . . . one more scientific word, and that is when something *doesn't* attract . . . some of you were saying it pushes away . . . or slips off . . . so instead of saying the magnet pushes away, I'm going to give you a new word . . . re'pel (*said with emphasis*) . . . it actually means to push away from you (*demonstrating with her arm*)

Comment

Again the new lexical item *repel* is introduced at the point of communicative need, when students have already expressed related meanings in familiar everyday language, using expressions such as *it slips off; it pushes it away; they're fighting* and *it feels like a strong wind*. The teaching of this new word occurred prior to the more formal teacher-guided reporting session. Whereas in the previous text the teacher used the written mode to give the word significance by writing it on the blackboard, here she accompanies the teaching by a physical demonstration. To interpret the new word, therefore, students are able to call both on their earlier experiences and on the visual support provided through the teacher's gestures.

Text 5.8
Classroom 1: Episode 12

Context

In this text, the teacher models to the students how their findings, which they had previously been coding as recounts, can be recontextualised as generalisations.

	STUDENTS	TEACHER
1	attract thumb tacks	right now we're going to talk about all thumb tacks/ so we're going to talk about magnets . . try it this way, magnets attract thumb tacks let's try it
2	magnets attract thumb tacks	
3		remember I'm not talking about just one I'm talking about all magnets/ I'm talking about all thumb tacks so let's try it again
4	magnets attract thumb tacks	
5		the nail is magnetic . . . so you tell me
6	the nail	magnets
7	magnets attract the nail	
8	the nails	
9		again
10	magnets attract nails	

Comment

In this text, the teacher initiates a further register-related development of the discourse, refocusing the talk away from personal recounts (based on the results of students' individual experiments) towards scientific generalisations (1). Thus the discourse moves from personal understandings to the arena of public knowledge.

The wording through which this new meaning is realised is built up with the students bit by bit, with the scaffolding from the teacher gradually reducing as the

students produce the target language alone. She makes explicit to the students the kind of meaning they will be making: we're *going to talk about all thumb tacks/ all magnets,* (1, 3), and models the wording of a generalisation: *magnets attract thumb tacks*. The overlapping speech and joint construction here suggest that at this point understandings are becoming shared. The students successfully twice produce the target language alone (2,4). At this point the students are required to transfer their knowledge with a new example: *the nail*. They rightly recognise that a generalisation will require a different morphological form (*nails*), but use this, rather than *magnets*, as the theme of the clause and are unable to proceed (6). A cue from the teacher, *magnets* (6) allows them to complete the clause, although still not entirely accurately (7). There is an immediate self correction from one student (*nails*) and this is followed by the whole class producing the target language (10). The movement of this stretch of discourse, and the gradual removal of 'supports' in the discourse of the teacher, is discussed further in Chapter 6 in the discussion of teacher scaffolding.

Text 5.9
Classroom 2: Episode 19

Context

In this text the teacher is writing on the board suggestions given to her by the students about the words that they expect to use when they write their journals.

	STUDENTS	TEACHER
1		what could be some words that we/ that I could put up here/ let's have a brainstorm of some words that we've learned about magnets so that we can *write* like scientists too . . so . . Josephine
2	J: repel	
3		good . . Amanda
4	A: magnetic?	
5		magnetic good girl . . em Francois?
6	F: unmagnetic?	
7		not quite but you've got the right idea Francois/ very good/ who can help him with that word . . Belinda?
8	B: non magnetic	
9		alright . . tell me Francois?
10	F: non magnetic	
11		non magnetic . . your idea was absolutely right and sometimes we do say 'un' meaning 'no' so you were . . that was clever . . . Joseph?
12	J: attract	

13		attract
14	M: Mrs C. when you're writing that . . . mustn't you use the past tense?	
15		no because I want you to tell me what you 'know about magnets from this . . . what do magnets 'do/ that's a good question but it's something that you've learned about magnets/ so then it would be something that happens 'always/ so we would write it in the 'present tense . . . good question . . that was good

Comment

This text is of particular interest in demonstrating how the teacher responds to the linguistic understandings of two students about the use of aspects of the new register. In both cases the suggestions, though not correct, are responded to in terms of a 'right idea' or a 'good question'.

Francois' suggestion of *unmagnetic* is acknowledged by the teacher in terms of his 'idea' which is *absolutely right* (7, 11), although she requires him to repeat the correct form before moving on. Joseph's question *mustn't you use the past tense* appears to refer to the work the students had done the previous day, when the teacher had written *attracted* on the board and elicited from the children the past tense form in relation to the specific findings from their experiments (see also texts 5.5 and 5.6). It is perhaps indicative of the degree to which metalinguistic understandings and terms had been integrated into this curriculum area, and been appropriated by the students. The teacher responds to Joseph's question by recapping what she had said earlier about the meaning of generalisations (see text 5.8), modelling through her own speech the correct tense for the generalisation she is seeking: *what you know about magnets from this/ what do magnets 'do/ something that happens 'always*. She concludes the explanation with a metalinguistic reference: *so we would write it in the 'present tense*. While some educators have argued against the usefulness of the explicit teaching of grammar (for example, Krashen 1985), this text illustrates how knowledge about language can be built up in the context of actual language use. In addition, it illustrates how Joseph's knowledge about language has enhanced his understanding of the meaning and form of the language he is being asked to use.

Text 5.10
Classroom 2: Episode 10

Context

This text occurred when the teacher was recapping with students what they had learned that day.

	STUDENTS	TEACHER
1	G: all magnets stick to magnets	
2	A (*and several*): oh attach	good we used the word stick we said all magnets stick to metal/ we used another word too/ I don't know if you remember the other word/ Andre does he's bursting/ excellent/ they at'tach good/ at'tach to metal another word . that starts similar to that one Luke?
3	L: attract	
4		excellent/ that the metals are at'tracted to the/ to the magnets . . 'or that magnets at'tract metal/ excellent/ I think that's a really good idea of what we did

Comment

The progression of this interaction shows how the children were led to use the word *attract*, moving from *stick to*, to *attach* (perhaps because of its phonological similarity), and finally to *attract*. Again we see the teacher foregrounding the linguistic learning itself: *we used the word; the other word; another word that starts similar*. She concludes the lesson (4) by recapping what the class has done that day in terms of the new lexical item.

Her final comment is of interest in relation to Lemke's argument that teachers tend to leave the semantics and grammar of scientific language implicit. Lemke (1990a) recommends that teachers should make explicit the basic relationships between concepts, and the various ways of expressing these semantic relationships, concluding that "students should be required to say anything in science in more than one way" (p. 170). Here the teacher offers two alternatives: *metals are attracted to the magnets. . 'or that magnets attract metal*, thereby demonstrating two ways in which the semantic relationship between 'metals' — 'attract' — 'magnets' can be expressed: by alternating the themes she models both active and passive verb forms. This is signalled explicitly by the marked stress on *or* and the two second pause that precedes it.

Reminding and handing over

After there has been teacher modelling and explicit talk about language, students are expected to begin to use aspects of the new register alone, (the teachers appearing to require this particularly with regard to lexis). As might be expected, however, since learning is not a linear process, students often reverted to more familiar ways of expressing meanings. In this situation the teachers usually did not recast the students' wordings as they had done earlier, but instead, simply drew attention to the students' wordings, causing the students, in SLA terms, to 'notice' the inadequacy (for the reporting context) of what they had said. Students were then usually able to self-correct alone, leading to a mode shift within their own wording. The term 'handover' is used here in the neo-Vygotskian sense (Bruner 1986), referring to the notion that once learners are able to carry out a task alone, a teacher's scaffolding diminishes and students are expected to take increasing responsibility for the aspect of the task they have now mastered. It is worth noting however that the point at which teachers chose to hand over was individually determined and varied from student to student, with some students being given very much longer periods of scaffolding than others, a process which is quite consistent with the nature of the ZPD. The individualised nature of handover relates to the quality of contingency which was discussed earlier, and helps to define what might represent one aspect of 'effective' teaching. (See Chapter 6 for further discussion of contingency, and for discussion of its individualised nature, see text 6.18).

In the following examples (texts 5.11 - 5.13), the teacher is talking with students in the context of teacher-guided reporting. In each case she reminds the students that they have learned an alternative coding, but gives them the responsibility for producing it.

Text 5.11
Classroom 1: Episode 15

	STUDENT	TEACHER
1	S: one north pole standing up . . next to another north pole which you put on top . . will push it away/ like it will make it move	
2		I want you to use that new word that we talked about . . push away?
3	S: it can repel the other magnet	

Text 5.12
Classroom 1: Episode 17

	TEACHER	STUDENT
1	G: the magnet doesn't stick on the . . cork	
2		tell me
3	G: the magnet doesn't stick onto the cork	
4		remember we're scientists now Gina .
5	G: em . ah! the magnet attracts	
6		the magnet . ?
7	G: the magnet 'didn't attract the cork	

Text 5.13
Classroom 1: Episode 17

	STUDENTS	TEACHER
1	M: we found out that the south and the south don't like to stick together	
2		now let's/ let's start using our scientific language Michelle
3	M: the north and the north repelled each other and the south and the south also . . repelled each other but when we put the/ when we put the two magnets in a different way they/ they attracted each other	

Comment

The teacher reminder is given either through a metalinguistic reference to the lexical item: *that new word* (5.11: 2), or through a reference to the nature of the register that she expects students to be using: *remember we're scientists* (5.12: 4); *let's start using our scientific language* (5.13: 2). In each case this prompt is sufficient to allow the students to reformulate their contribution. The result is a mode and field shift by the student which incorporates the specific lexis the teacher is focusing on. It could be argued that these prompts by the teacher cause students to 'notice' their own wording because it engages them in metalinguistic thinking (Swain 1996); their language is consequently 'stretched' and as a result they produce more comprehensible output. These texts also provide evidence of uptake of the new lexis by the students. These issues are taken up further in Chapter 7.

Unpacking written language

Texts 5.14 - 5.16 exemplify how mode shifting can occur from more to less written, when the teacher 'unpacks' language which she believes might be difficult for some children to comprehend. All three texts occurred in the same context, when the teacher was explaining the written instructions for experiments that children would later carry out in groups. The experiments were designed to develop students' understanding of magnetic attraction and repulsion in relation to the placement of the poles of the magnets, and of the relative strengths of the poles.

The layout of the three texts enables the mode shifting of the teacher to be illustrated more graphically. The discourse has been transcribed using three columns. The left hand column contains the most context-reduced wording: the written instructions from which the teacher is reading. The middle column contains a more 'unpacked' recoding of these instructions: it is more spoken-like 'everyday' language with which the students are likely to be familiar. The right hand column contains language which is context-embedded: here the teacher is referring to the materials that she is holding or pointing to. Some of the discourse has been omitted so that the transcription includes only those elements of the discourse which are relevant to the current discussion. Students' contributions are in italics.

Text 5.14
Classroom 1: Episode 18

Context

The experiment to which the teacher is referring here involved placing two bar magnets end on, and then reversing one magnet. The written instructions were:

> *Use a glass table or a smooth desk. Using two bar magnets, lay them down in the same line with the poles close together. Observe and record what happens. Then leaving one magnet the same way, reverse the other magnet. Observe and record what happens.*

	Context reduced *(written instructions, read aloud by teacher)*	**'Everyday' language**	**Context embedded** *(use of material and visual context)*
1	"use a glass table or a smooth desk"		
2		your desks/ desk surfaces are smooth	
3			that sort of surface over there

4	"lay them down in the same line"		
5		does it mean . next to each other?	*T. demonstrating 'next to' with magnets*
6	no, in the same line		*T. demonstrating with magnets*
7			lay them like that (*T. demonstrating*)
8	and it says "with the poles close together"		
9		what are the poles?	
10		*ends/ sides*	
11		*those things on the side*	
12			I would call this the side (*T. demonstrating*)
13		*the edges*	
14		*the thing that attracts the metal object*	
15		we're talking about each 'end of the magnet so that's what we have to say	
16	that the poles are close together		
17	so there's the same line and the poles are close together		(*T. demonstrating*)

Comment

In (2), the teacher gives an example of the kind of surface to which the instructions are referring, foregrounding what it familiar to the listeners (*your desks*). She does not directly explain the meaning of the instructions, rather her unpacking stands in the relation of exemplification (Halliday 1995). In (3) she further concretises the instructions by referring specifically to a particular surface within the visual range of the students; the text is exophorically referenced (*that surface, over there*). The teacher then focuses on the somewhat unusual wording *in the same line* (4). She poses a question *does it mean next to each other?* (5). While *it* refers to the wording of the instruction, the teacher is at the same time demonstrating *next to each other* with two magnets. Her question therefore mediates between the written text and to the immediate context of the here-and-now discourse. Her question draws a series of *no's* from the students. (It is worth noting that a polar question in this context would almost certainly be expecting the answer no, otherwise the teacher would have been more likely to have simply given students the information in declarative form: *it means next to each other*). The teacher's next move is to expand on this

negation, and she does this not simply by negating the original structure (which would have resulted in 'it does not mean next to each other') but by repetition of the focus lexis: *no, in the same line* (6). This is further unpacked by her next move *lay them like that* (7) where again the referents of the exophoric reference in the text are found in the immediate concrete context of the students. Again we see how the teacher's spoken text mediates between the written text and the immediate context. The reference system exemplifies this: the reference to *them* in the written text (*lay them down*) is to be found within the text of the written instructions, the referent to *them* in the teacher's spoken text (*lay them like that*) lies in the familiar world of the classroom in which the interactants are sitting.

The teacher continues with the instruction *with the poles close together* (8). In response to the teacher's question the students offer several suggestions. They appear to know what the poles are, but only one student produces the specific word which the teacher finally offers: *we're talking about each end of the magnet* (15). She then explicitly draws the students' attention to the language on which she is focusing — *so that's what we have to say* — before returning finally to the wording of the written instructions (16, 17).

Text 5.15
Classroom 2: Episode 18

Context

The experiment required students to place a magnet into a 'cradle' of paddle pop sticks which had been inserted into a block of polystyrene, and then to place a second magnet on top. The second magnet then had to be reversed and the results recorded. The instructions were:

> *Place a bar magnet into the cradle made by the paddle pop sticks. Place a second bar magnet on top. Observe and record what happens. Repeat, alternating the poles. Observe and record what happens.*

	Context reduced *(written instructions, read aloud by teacher)*	**'Everyday' language**	**Context embedded** *(use of material and visual context)*
1	"Place a magnet into the cradle, and place another magnet on top of the cradled magnet"		

2			so you've got one magnet in here (*T. demonstrating*) then you have to put another magnet on top
	four turns later		
3	"alternating the poles"		
4		changing (the poles)	
5			if you put it facing/ you've got one magnet in there and you put it in facing one way/ change the poles around (*T. demonstrating*)
6		change it to the other side	
7	alternate the poles		
8		so you're trying it each way	

Comment

The teacher begins the unpacking of these instructions by shifting immediately to the demonstration (2) without the interim step of recoding through familiar language, perhaps because the material object itself can be seen by all the students, while the material process and associated circumstances *place . . on top of* are not seen by the teacher as problematic for the students.

In (3) the focus lexis *alternating* is initially explained through a more familiar lexical substitution: *changing* (4). In her next move the teacher once more embeds the text within the context, demonstrating what the students should do as she is speaking (5). She continues by shifting the text away from the immediate context, repeating the substitution *changing* (6) before returning to the written wording, *alternate the poles* (7). The entire clause is then further recoded by the teacher once more in more familiar language: *you're changing the poles* (8).

Text 5.16
Classroom 1: Episode 18

Context

The experiment here required students to make a chain of paper clips using a magnet. The instructions were:

Take a tray of paper clips and a bar magnet. Touch one paper clip to the pole of a magnet. Make a chain of clips by touching another clip to the first one and so on.

Context reduced *(written instructions, read aloud by teacher)*	**'Everyday' language**	**Context embedded** *(use of material and visual context)*
"touch one paper clip to a pole of the magnet		
	'a pole/ OK any pole	
"make a chain of paper clips by touching another clip to the first one and so on"		
		so this one's attached to the magnet (T. *demonstrating*) and then you're going to use this one to try and touch another one/ another one/ another one until you make a long chain

Comment

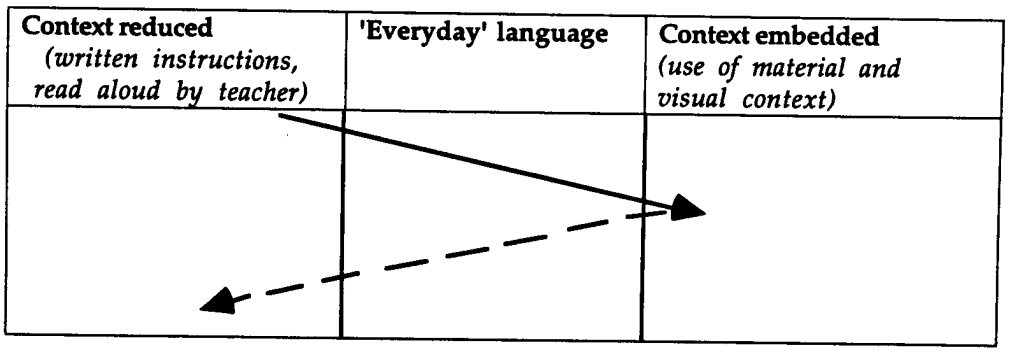
Here the unpacking of the written instructions again relies on explicit reference to the immediate context. However, the written instructions also contain a potential source of confusion. In the clause *touching another clip to the first one, another clip* functions as participant, with *to the first one* as circumstance (ie. the point at which *another clip* will touch). However if this process were carried out (in a material sense), the sequence in which it would occur would suggest that a more logical textual organisation is to foreground the first clip rather than the second, (since the first clip is the actor), so that *the first one* functions as a participant in the clause, (for example, *make a chain of paper clips by touching the first clip to another one*). This is exactly what the teacher does: in her recoding, the sequence of *another clip* and *the first one* in the written clause is reversed, and are represented in her text in the order in which the first two links of the chain would be constructed.

Written instructions	**Teacher recoding**
make a chain of paper clips by touching	you're going to use
another clip	this one to try and touch
to the first one	another one

Most of the discussion about the unpacking of the instructions in these three texts has focused on the handling of lexical items, but there is a further way in which the written texts are made more 'familiar'. Procedural instructions commonly foreground the material process in the clause (Derewianka 1990) through its choice as theme, here for example the written instructions have *use, lay, alternate, place, touch* and *make*. A further feature of such procedures is the absence of human participants. In the teacher's recoding however, the students themselves are participants in the text and are thematised in many clauses, (see for example 5.13: turn 2; 5.14: turns 2,5,8; and 5.15: turn 4). Circumstances are also recoded in the context of a visual demonstration, so that they become exophoric in the teacher's text, see for example, text 5.13: *in the same line* (4)/ *like that* (7); and text 5.14: *in the cradle* (1)/*in here* (2).

Overall the pattern of mode shifting in these examples takes on a characteristic shape, suggested by Figure 5.2.

Fig. 5.2 Mode shifting: visual representation



The shift may occur more than once, with the teacher returning to the written version, as illustrated by text 5.14, or the shift may simply be back towards more familiar language, as illustrated by text 5.16. These shifts, where the same message 'content' is being coded in several ways, produces a text with considerable message redundancy, giving students opportunities to hear the message in several forms.

In terms of this discussion of mode shift, it is clear that language itself is not the only component which is important. The immediate or 'concrete' context also plays a significant part in 'comprehensibility'. Lemke (1998) argues that meaning cannot be adequately understood in terms of a single semiotic system such as language: we do not make meaning with language alone. We use a range of resources in the construction of meaning, including actional and visual semiotic resources. Where

text is referred to as 'context-embedded', therefore, it does not 'mean' alone. It can only be understood because of its coordination with the visual, gestural and actional components by which it is mediated. At an intuitive level most teachers recognise this of course, and seek to make language comprehensible for their ESL learners by the use of resources such as pictures, concrete objects, mime and gesture, and a range of hands-on curriculum activities. Here the teacher draws explicitly on broader semiotic resources to 'unpack' the written instructions she is reading with the students.

The discussion of these examples focusing on written instructions suggests the ways in which a teacher may assist her students in understanding the more decontextualised language of written text. At the same time it highlights the danger of any approach which equates comprehensibility simply with the avoidance of more complex language. While simplification would probably also have served the purpose of making language comprehensible for students, it is clear that such an approach would also have restricted students in gaining access to models of alternative registers. What is happening in the examples discussed, on the other hand, is a much richer interpretation of how input can be made comprehensible: students have, within the same situational context, access *both* to written text *and* to more familiar ways of coding similar meaning, as well as to the semiotic resources provided by the visual and actional context. An analysis of the language in terms of mode shift in this way offers a linguistic perspective on the notion of comprehensible input, an issue which is discussed further in Chapter 7.

Part 1 of this chapter has given examples of four ways in which teachers' contributions led to mode shifts in the discourse, in general from more spoken-like to more written-like discourse. Making these ways explicit also recontextualises them as usable teaching strategies. In terms of classroom practice then, the strategies of *Recasting, Making the new register explicit, Reminding and handing over,* and *Unpacking written instructions* appear in these data to support students who are learning to control the more decontextualised registers of school.

PART 2: MODE SHIFTING ACROSS MACRO-SEQUENCES OF DISCOURSE

This section considers mode shifting across a sequence of episodes, where the overall discourse of each episode progressively shifts towards more written-like language and into a more formal register. It shows how science knowledge is recoded into a more context-reduced register over the course of several episodes, and how this register is jointly constructed by teacher and students. Edwards and Mercer suggest the process of learning in the classroom is one whereby teacher and students "relate discourse to context, and build through time a joint frame of reference" (Edwards and Mercer 1987, p. 65). The illustrative texts discussed here show how such frames of reference are jointly built up through the shared experiences of teacher and students: and how, through their interactions, students and teacher develop shared meanings and a shared language. This process hinges in particular on the linguistic variation which results from changes in the situational context of each new episode, specifically, a decrease in the degree of situation-embeddedness. Linguistically the contexts represent a movement from context-embedded to increasingly more context-reduced texts; as in Part 1 of this chapter, this movement is described through the construct of the mode continuum, discussed in Chapter 3.

The most context-embedded discourse occurs when students are carrying out science activities in small groups. They are talking while doing, and this is typically mediated through 'everyday' language which is familiar and shared by both students and teacher, is context-embedded and frequently contains exophoric reference. Language is used not simply to comment on what is happening, but also to direct action or discuss procedural matters. The outcome of this small-group talk is the development by small groups of children of some shared understandings and personal experiences.

Discourse becomes less context-embedded in the teacher-guided reporting sessions. Students report on what they did and what they found out, so that the understandings developed within the small groups are now shared with a wider audience. In this process, students are supported in their reporting attempts by the teacher who 'scaffolds' and reshapes learner talk, clarifying with them what they are saying, and frequently recasting their talk in ways more appropriate to the situational context. Her recasts incorporate shifts in field and mode, and thus the

scientific register begins to be jointly constructed, and students also begin to use aspects of the new register themselves. This situational context has been partly explored in Part 1 of this chapter, but here its significance in broader sequences of discourse is considered.

The most context-reduced texts occur during writing activities, often when students write in their science journals. From the perspective of the research, this context is also one where the 'uptake' of the new register can be most easily evaluated. During the writing task itself there is little explicit teacher-support of the type evident in the teacher-guided reporting, and so in one sense the journal writing is what Edwards and Mercer discuss as a 'handover' stage, where the teacher's support is gradually withdrawn and the students begin to appropriate the new learning (here the new register) for their own use.

The sequence of texts in each classroom thus represents two of the stages identified in Chapter 4: *doing the task* and *reflecting on the task.*

Texts from Classroom 1

Texts 5.17 to 5.25 come from Classroom 1, and occurred sequentially in five episodes in the context of learning about magnetic repulsion (Episodes 14-18). As described in Chapter 3, each group of students was engaged in different experiments, which, while they all focused on the concept of magnetic repulsion, involved different procedures, so that when information from the groups was reported, students were hearing new — although related — information from each group. This information gap was critical in providing a social purpose for the teacher-guided reporting session and so integral to the overall organisation of the teaching activities. The experiment which is the focus of the texts involved students making a 'cradle' with a block of polystyrene and paddle pop sticks. They placed a bar magnet within this cradle and a second magnet on top. When like poles were in contact, the top magnet is repelled by the bottom magnet and 'floats' above the base magnet.[1]

Texts 5.17 and 5.18 occurred as students were engaged in carrying out the experiment. After the students had completed the small group experiments, they were asked to report back to the rest of the class about the results of their own

[1] The instructions for this activity can be found in Part 1 of this chapter, text 5.15.

work. Prior to this reporting session, however, the teacher talked with the students about the 'scientific words' they would use, and taught the lexical item *repel* (text 5.19). The students then reported back to the class about what they had discovered. Texts 5.20 and 5.21 occurred during this reporting, with Hannah as the reporter. Text 5.22 is taken from Hannah's science journal, and is the result of an entry describing what she had learned that day. Texts 5.23 and 5.24 are journal entries from other students who had listened to the interaction between the teacher and Hannah. Following this reporting session, and after all the groups of students had reported on their various experiments, the teacher talked with the students about any generalisations they could now make on the basis of what they had done and heard (text 5.25).

Text 5.17
(students carrying out activity)

Hannah	try . . . the other way
Patrick	like that
Hannah	north pole facing down
Joanna	we tried that
Peter	oh!
Hannah	it stays up!
Patrick	magic!
Peter	let's show the others
Joanna	mad!
Peter	I'll put north pole facing north pole . . . see what happen
Patrick	that's what we just did
Peter	yeah . . . like this . . . look

The dialogue continues for several minutes longer as the students try different positions for the magnet, and then they begin to formulate an explanation (5.18). There has been no teacher input during the course of the conversation.

Text 5.18
(students carrying out activity)

Hannah	can I try that? . . . I know why . . . I know why . . . that's like . . because the north pole is on this side and that north pole's there . . . so they don't stick together
Peter	what like this? yeah
Hannah	yeah see because the north pole on this side . but turn it on the other . . this side like that . . . turn it that way . . yeah
Peter	and it will stick
Hannah	and it will stick because . look . . the north pole's on that side because . .
Peter	the north pole's on that side yeah

Text 5.19
(prior to teacher-guided reporting session)

Teacher	*(referring to reporting session about to begin)* what are some of the words we are going to use? *(children offer : magnet, attract, metal, north pole, south pole)* now I'm going to give you another word for what Joseph was trying to say . . . one more scientific word and that is when something *doesn't* attract . . . some of you were saying it pushes away . . . or slips off . . . so instead of saying the magnet pushes away, I'm going to give you a new word . . repel *(said with emphasis)* . . it actually means to push away from you *(demonstrating with her arm)* so we're going to use words like . . . *(children again offer associated lexis, and include 'repel')*

Text 5.20
(teacher-guided reporting, teacher interacting with Hannah)

	STUDENTS	TEACHER
1		try to tell them what you learned . . . OK . . . *(to Hannah)* yes?
2	em er I learned that em when you put a magnet . . .	
3		*(laughter from Hannah and children as Hannah is attempting to explain without demonstrating with her hands)* when I put/ when you put . . . when you put a magnet . . . on top of a magnet and the north pole poles are . . . . . . *7 second pause, Hannah is clearly having difficulty in expressing what she wants to say)*
4		*(laughter)*
5	yes yes you're doing fine . . you put one magnet on top of another . .	
6		and and the north poles are together er em the magnet . . . repels the magnet er . . . the magnet and the other magnet . . . sort of floats in the air?
7	I think that was very well told. . . very well told . . do you have anything to add to that Charlene?	

The teacher invites other contributions, and then returns to Hannah. She invites Hannah to first show the experiment to the other students, and then asks her to explain it again.

Text 5.21
(teacher guided reporting, Hannah's second attempt)

	STUDENTS	TEACHER
1		now listen . . now Hannah explain once more . . . alright Hannah . . . excuse me everybody *(regaining classes attention)* . . listen again to her explanation
2	the two north poles are leaning together and the magnet on the bottom is repelling the magnet on top so that the magnet on the top is sort of . . . floating in the air	
3		so that these two magnets are *repelling* each other and . . . look at the force of it.

Text 5.22
(Hannah's written text, originally accompanied by diagram)

I found it very interesting that when you stuck at least 8 paddle pop sticks in a piece of polystyrene, and then put a magnet with the North and South pole in the oval and put another magnet with the north and south pole on top, the magnet on the bottom will repel the magnet on the top and the magnet on the top would look like it is floating in the air.

Comment

The initial small group activities in the course of which texts 5.17 and 5.18 were produced led to the use of highly context-embedded language. This is a supportive context for students learning through the medium of their second language because of the interrelationship between the immediate visual context, the material action and the language being produced, a point which was discussed in the previous section of this chapter and which is explored in more detail in Chapter 7. As a starting point then, this context provided a source of comprehensible input for learners and allowed children to develop certain scientific understandings about the topic using familiar everyday language, here the discovery that the position of the poles is significant to the movement of the magnets. A significant point is that students are being given an opportunity to develop this shared understanding *before* they are expected to understand and use more scientific discourse. The small group work here is the first step in building up the shared understandings out of which later discourse arises.

Both texts 5.17 and 5.18 have many of the characteristics of spontaneous spoken language as it occurs in contexts where there is visual support for meaning. These include several exophoric references (*like that, like this , this side, that way*), which in this context are clear to the listeners. These references, of course, carry meanings which, in the absence of a visual context, must be realised in a different way, and it is in fact precisely this aspect of discourse which later causes Hannah, and many of the other students, difficulty in the reporting session.

Discourse from this stage also indicates the foregrounding of interpersonal aspects of language: text 5.17 foregrounds social interaction rather than information about magnets. As discussed in Chapter 3, language enables speakers to exchange one of two items: goods and services (including action) or information (Halliday 1985b). This text is composed largely of action, rather than information, exchanges (Berry 1981); language is being used primarily to control action. It is typical of many of the texts produced in the small group work around the doing of the experiments; typically there are a large number of imperatives as students direct each other, (in this text: *put, let*). There are also interpersonal adjuncts, indicating affect, such as the expression of attitude and feelings (*magic! mad!*). Participants are generally human and frequently thematised; and they relate to the interactants themselves (*We tried that; I'll put north pole facing north pole)* or to other students; *(Let's show the others).*

As the discourse progresses however (text 5.18), individual utterances become longer and more explicit, and this occurs as the students begin to formulate explanations for what they see (note the logical connectives *so, because*). Interpersonal elements are reduced; there is now a non-human participant (*the north pole*) which is thematised and this, rather than the interactants themselves, becomes the topic of conversation. The cognitive challenge inherent in the teacher's instruction to *try to explain what you see* may have been significant here, since it extended the task from simply 'doing' to 'doing and thinking' (note the use of *explain* rather than, for example, *describe*). Although this is something which a teacher might say regardless of whether there are second language learners in the class, the explicit focus on thinking is an important one in the light of this particular teaching context, where a teacher must balance the need for suitably high levels of cognitive learning with learners' relatively lower levels of English, and where learning activities aimed at development of the second language must also be linked to cognitive growth. Clearly within these texts there is evidence of

children's learning of science: the beginnings of an understanding of why the magnets are behaving as they are, and attempts to hypothesise about the causal relations involved. Through the kind of exploratory talk which begins to be evident here in the small group work, "knowledge is made more publicly accountable and reasoning is more visible" (Wegerif and Mercer 1996, p. 51).

In text 5.19, already discussed in Part 1 of this chapter, the teacher introduces a new lexical item to the students, which students are expected to use in the more public context of reporting to others in the following episode.

In texts 5.20 and 5.21, the teacher is interacting with the children and helping them to reconstruct their experiences, producing texts where information is being exchanged and thus developing understandings which will now become common to the class. As argued earlier in relation to experimental activities in the science classroom, "activity by itself is not enough. It is the sense that is made of it that matters" (Driver 1983, p. 49). Lemke writes in a similar vein: "what the eye 'sees' has little enough to do with science or learning. It is the sense we make of what we see, the meaning for us of what we see that matters" (Lemke 1990a, p. 146). In these texts the teacher is working with the children to 'make sense' of the activities in which they have been engaged. Wegerif and Mercer suggest that it is through being encouraged and enabled "to clearly describe events, to account for outcomes and consolidate what they have learned in words" that children are helped to "understand and gain access to educated discourse" (Wegerif and Mercer, 1996). Texts 5.20 and 5.21 illustrate one type of situation in which this process can occur.

As already suggested in Chapter 4, the micro-interactions between teacher and students in these teacher-guided reporting sessions are different in several small but important respects from the IRF pattern associated with more traditional classrooms. However these differences appear to have significant effects on the interaction as a whole. As Cazden points out, "even small changes [to the more marked patterns of teacher-student interaction] can have considerable cognitive or social significance" (Cazden 1988, p. 53). In texts 5.20 and 5.21, the interactions approximate more closely what occurs in typical mother-tongue adult-child interactions outside of the formal teaching context, suggesting a different orientation by the teacher to talk in the classroom. These interactions are examples of what Chapter 4 described as 'dialogic'. The teacher begins the exchange, for example, with inviting students to relate what they have learned, rather than with a 'known answer' or display question. It has been suggested that teachers'

questions are often framed in ways which do not allow for students to make extended responses (Dillon 1990). Here, by contrast, the teacher sets up a context where it is a student, rather than herself, who initiates the specific topic of the exchange, and who takes on the role of "primary knower" (Berry 1981). Thus although it is the teacher who is in control of the knowledge associated with the overall thematic development of the unit of work, individual exchanges like these locate that control in the student. The effect is to modify relations of power by shifting the location of knowledge, at least temporarily, onto the student, thereby modifying knowledge asymmetries and typical teacher-student roles. As the episode summaries indicated, teacher-guided reporting episodes typically incorporate dialogic patterns of exchange like those in texts 5.20 and 5.21.

As discussed in Chapter 2, adult-child mother-tongue interactions in non-pedagogic discourse are characterised by the reciprocity and mutuality of the speaker roles, which lead to longer stretches of discourse in which meaning is jointly constructed. Here the teacher-student interactions are similar in quality. Part 1 of this chapter showed how the teacher can 'lead from behind', and how, while following the learner's lead and accepting as a valid contribution the information given by the student, she simultaneously provides alternative linguistic forms to encode the learner's meaning in more context-appropriate ways. A similar example, taken from the same reporting session, offers a further illustration of this process and shows how a teacher's contribution can both extend what the student has said and shift the meaning into a sociolinguistically more appropriate register. The teacher here provides the appropriate lexis (*repelling*) and recasts the student's contribution into a more written-like coding, thus encapsulating both field and mode shifts. The teacher's response however remains closely linked to what the child has said, through the conjunctive *so that*, which provides a cohesive tie across the two turns.

Hannah:	the magnet on the top is sort of floating in the air
Teacher:	so that the two magnets are repelling each other

What is also evident is the reciprocal nature of these dialogic interactions. In the final exchange in text 5.21, the teacher takes up the role of a conversational partner by expanding on what Hannah has said and adding a new element of meaning (*and look at the force of it*). While classroom interactions between teacher and students can never be symmetrical, dialogic teaching achieves a greater degree of symmetry than is the case in traditional teacher-student exchanges. Van Lier

makes a useful distinction between symmetry and equality, arguing that even when one participant is more powerful or more knowledgeable, the talk may not necessarily be asymmetrical, if the rights and duties of speaking are more evenly distributed (van Lier 1996). The kind of interactional pattern evident here illustrates how even exchanges which overall retain an IRF 'flavour' can produce more conversational discourse when the teacher scaffolds the interaction rather than instructs directly. The notion of scaffolding and the role for the teacher which it constructs is the subject of the following chapter.

The dialogic pattern that occurs in the context of teaching-guided reporting is significant in relation to Vygotsky's notion, discussed in Chapter 2, that learning occurs with support from those more expert, at the learner's "zone of proximal development" (Vygotsky 1978), that is, at the 'outer edges' of a learner's current abilities. In text 5.20 it can be assumed that the student has reached her own zone of proximal development, since she hesitates for a considerable time, and can presumably go no further alone. The recasting and support she receives from the teacher then appears to be precisely timed for learning to occur; perhaps it is largely in the ability of the teacher to make such contingent responses that the skill of dialogic teaching lies:

Hannah: em er I learned that em when you put a magnet . . . when I put when you put . . . when you put . . . a magnet on top of a magnet and the north pole poles are. . . (*7 second pause*)

Teacher: yes yes you're doing fine . . . you put one magnet on top of another . . .

The context of teacher-guided reporting here, and the dialogic pattern by which it is realised in this data set, also gives students opportunities to produce longer stretches of discourse: their contributions are whole units of meaning which are more written-like than those which occurred in the small group work. Throughout the reporting sessions, as can be seen by the illustrative texts in this and the following chapter, students regularly produced utterances of four or more clauses in length, which represents a considerable increase over the responses normally associated with the 'known answer' or display type teacher questions which typify the IRF structure. In many cases this required the teacher to increase 'wait time', and on occasions this was as long as eight seconds. Research suggests that when teachers ask questions of students, they typically wait one second or less for the students to begin a reply, but that when teachers wait for three or more seconds,

there are significant changes in student use of language and in the attitudes and expectations of both students and teachers (Rowe 1986). The importance of wait time is likely to be increased for students who are formulating responses in a language they do not fully control. Krashen and Pon (1975, cited in John-Steiner 1985), for example, describe the self correcting behaviour of an adult second language learner, who, given sufficient 'processing time' was able to correct almost ninety five per cent of her errors. It is also worth pointing out that in the current study, students did not appear to became uncomfortable or embarrassed by the length of the wait time; on the contrary there were many explicit and enthusiastic bids for turns to offer contributions. What is probably important from the perspective of the learner, is that students speaking in this context were able to complete what they wanted to say, whether alone or through interaction with the teacher, and as a result were positioned as successful interactants and learners.

Overall, texts 5.20 and 5.21 indicate a marked change from texts 5.17 and 5.18 in the relative importance of the two major speech functions. Where the earlier texts were largely concerned with the controlling of action, here the business of the text is the exchange of information. While there are still human participants (*I* and *you*), there are many more references to non-human participants than in the texts associated with *doing* the task; *magnet* occurs nine times in Hannah's speech and *the north pole* three times and both of these are thematised. Thus the teacher-guided reporting may be characterised as a bridge for learners between personal everyday ways of knowing and the public discourse of shared and socially constructed knowledge. The teacher takes on a mediating role between children's individual experiences and the public discourse which they are developing, by using their personal knowledge to show how generalisations might be generated. The following chapter expands on this notion of teaching as mediation.

The written text from Hannah's journal (text 5.22) suggests that the interaction between student and teacher has provided a source of linguistic input for the student which she has taken up and appropriated in her writing. In Hannah's text, which was written without further assistance other than teacher provision of the spelling of *polystyrene,* her interaction with the teacher, and her own second attempt at wording, have influenced both syntax and lexis.

In addition there is also evidence that the reporting sessions influenced not only the interactants themselves but also those who listened to the interactions as part of the larger group. The following text (5.23), also a journal entry, was produced

by a student who had not taken part in this particular experiment herself, but her text too echoes both the teacher's recast and Hannah's final attempt:

Text 5.23

> The thing made out of polystyrene with paddle pop sticks, one group put one magnet facing north and another magnet on top facing north as well and they repelled each other. It looked like the top magnet was floating up in the air.

The final written text (5.24) comes from a child on a special education program who was also a second language speaker. It is significant in showing some evidence by the learner of metalinguistic understanding of register.

Text 5.24

> I learned that the south pole and the north pole attract. And I learn how to talk like a sciencetist (sic)

The final text from Classroom 1 (text 5.25) shows the teacher helping students make generalisations on the basis of their earlier experiments. It occurs after the reporting session. The teacher is standing in front of the blackboard and pointing to a matrix to which the students are responding (see Figure 5.3). As the students respond the teacher ticks the appropriate *attract* or *repel* box.

Fig 5.3 Matrix on board

		Attract	Repel
N	S		
S	N		
N	N		
S	S		

Text 5.25

	STUDENTS	TEACHER
1		good . . . what if I try the south pole of this magnet and the north pole of that magnet . . yes Francois come on a sentence
2	Fr: the south pole and the north pole will attract	

3		good boy/ good Francois/ alright and let's try the south pole of this magnet and the south pole of the other magnet . . Stephanie
4	S: the south pole and the south pole will re . . repel	
5		so I would like two ideas that we get from this . . two *general* ideas what we call *generalisations*. . . who can give me something that will happen *all* the time not what just happened to us today but what will happen do you think . . . Gina do you want to try
6	G: if you put the north pole and the north pole together em that will not . . . . that will repel and if you put the south pole and the south pole together that will repel too	
7		good alright that will *always* happen so we'll say south pole and south pole . . . ?
8	Ss (*several*): repel	
9		north pole and north pole . . . ?
10	Ss: repel	
11		alright . . who can give me something else . . Jennifer
12	J: em . . the north pole and the south pole attract	

Comment

The students as actors have now disappeared from the discourse, and what is foregrounded is the field of science itself. Students now express what they have learned as a series of generalisations, realised through explicit written-like clauses. The personal recounts of the earlier texts are no longer in evidence, and the text therefore represents a further mode shift incorporating a shift from personal recounts to statements of generalised principles.

This set of texts from Classroom 1 illustrates how the discourse shifted over the course of five episodes from an initial focus on personal activity, realised through the context-embedded 'everyday' talk within the small groups, to more written-like discourse which begins to incorporate some of the register features of more formal scientific writing. The talk with the teacher in the teacher-guided reporting sessions was significant in providing a linguistic 'bridge' from the context-embedded talk of the experiential activity to the more decontextualised discourse of the journal writing. Subsequent talk about the generalisations which could be made provided a

further 'bridge' away from personal recount towards the public and shared discourse of the scientific topic.

The following set of texts, which come from Classroom 2, illustrate a similar process of mode shifting within the discourse of a sequence of episodes, and again exemplify the *doing* and *reflecting* stages identified in Chapter 4.

Texts from Classroom 2

The texts from Classroom 2 involve a similar set of tasks. Because of the number of texts here, comments follow each text.

The texts are taken from episodes 19 - 26 and the discourse is again tracked across this series of episodes. In the first text of the sequence (text 5.26) the students are engaged in doing an experiment in small groups, (the same experiment as in Classroom 1, focusing on repulsion). The teacher joins the group briefly to check that the students are on task and to find out what they have done (text 5.27). As the lesson ends, the students briefly record in their journals what happened (text 5.28). The students will later be asked to report back their findings to the rest of the class, and in preparation for this the teacher asks them, at the beginning of the next lesson, to first recall in their groups what had happened. Text 5.28 is an example of this small group discourse in which students recall for themselves what happened. The teacher joins them briefly (5.30) and the students request and carry out a second 'practice' (5.31). At this point the reporting session begins, and Julianne reports on behalf of the group (5.32). As each group reports, the teacher draws their attention to the similarities in each set of results, and after all the groups have reported on their individual experiments, the teacher asks the children what they can see in common with the results. The set of five texts from 5.33 - 5.37 illustrates how the teacher begins to build this common framework. At this point, which coincides with the end of a lesson, the students are asked to write down one thing that happened in their own experiment, and a more general statement about the commonalities of the results. This discussion around commonalities, now based on what the students have written, continues in the next lesson (5.38). The students return to work on the written generalisations they had begun at the end of the previous lesson. The writing samples are examples of this revised writing (5.39) and reflect the teacher-student talk of the previous episodes. For comparison purposes, the earlier written texts completed after the original experiment (5.28) are repeated. Each pair of texts illustrates a shift from

recount to generalisation, reflecting the mode shift evident in the teacher-student talk in the series of episodes as a whole.

Text 5.26

(A group of four students is experimenting with magnets)

	STUDENTS
1	OK (*reads*) "then place another . . magnet on top of the cradled . magnet/ observe what happens"
2	don't/ put it like that
3	ohhhhhwoah (*loud exclamations*)
4	'look at 'that
5	how'd that happen?
6	oh . . 'look at 'that
7	maaad
	(*laughter*)
8	look I'm not touching that
9	** no leave it it's making
10	hey look at this Andre
11	yeah look
12	look what
13	watch this . . .
14	ohh mad
15	you turn it over the other side and it won't stick . .

Comment

This text shows similar language features as text 5.17 in Classroom 1. Interpersonal aspects of language are foregrounded: imperatives are thematised (turns 2, 4, 6, 8, 9, 10, 11, 12, 13) and affect is expressed (turns 3, 7, 14). There is little within the text that would identify its field, and, like text 5.17, the exchanges centre around the controlling of action rather than the giving of information. Participants are human — *I, you, Andre* — and there is little evidence of explicit reasoning or the use of "exploratory talk" (Wegerif and Mercer, 1996) at this point. As pointed out in relation to the equivalent text from Classroom 1, there are implications for the use of such activities in the classroom, namely that while learning is certainly occurring, in that the activity itself provides a demonstration of certain scientific concepts, the situational context at this point may not in itself provide sufficient reason for understanding to be explicitly articulated.

Text 5.27

(The group is joined by the teacher)

	STUDENTS	TEACHER
1	put it like that/ put it like that it goes up . . and if you turn it around . . .	

2		what's/ what's not/ what's it not doing?
3	miss it's not touching the other magnet	
4	and if we turn it around it	
5	no it's not touching	
6		so you place the magnet . . .
7	and then	
8		so when you had the poles that way . . what's happened there . . . .
9	em we turned the magnet over and . . we . the magnet didn't stick but it stuck to the	
10		right so this is one side and the magnets have stuck together . . OK alright and. well it asks you here it says "place a magnet on top of the cradled magnet/ observe what happens and record" . . and then you've got to change the poles so have you done it both ways . ?
11	yes Miss	
12	yes Miss	
13		alright you've done it both ways
14	yeah we'll write	so you're recording that one . . . . and what happened the other way?
15	the other way make it kept up	
16		can you turn it round for me and show me what it looks like/ I missed that I didn't see that
17	got it/ the one the one at the bottom/ turn it over	
18	it's not touching it	
19		let me have a look . . . . . what's happening there / can you describe that
20	em cos they're not touching each other	
21		the magnets aren't touching . right so there's some sort of space in between. . .
22	the the magnets there's one magnet here and when the the em power . comes down and gets powerful it it . . stays on the on the	
23		so what's this magnet trying to do? to that one?
24	it's trying to lift it up	

25		OK it's repelling isn't it/ it's not attracting like it did the other way. that magnet's repelling OK/ so that you've recorded that way . alright go back to the other one/ you can keep going/ sorry to interrupt you . just wanted to hear what you've done

Comment

The addition of the teacher to the group changes the nature of the discourse. The function of the exchanges is now not to control action, but for the teacher to ask for and the students to give information. The nature of the teacher's question — *what's happening there? can you explain that? can you describe that?*— requires students to produce longer stretches of talk than in the previous text, and now their responses incorporate complete clauses. (Although in terms of form these are polar questions, the expectation of both teacher and students is not of course that a simple *yes* or *no* answer will be given. *Explain* and *describe* carry the tonic stress and are the major information units here. In this context such questions appear to function as an invitation to the students to 'take the floor'.) The teacher's requests for information result in talk which begins to reconstruct the events for the benefit of a listener who had not shared them. This interaction provides a 'rehearsal' for what follows in a later episode, when students will be asked to explain to the class as a whole the results of their own experiments.

Text 5.28

(Journal entries at the end of the lesson, written immediately after the students had completed the experiment.)

STUDENTS	JOURNAL ENTRY
Julianne	*(accompanied by a diagram of the polystyrene with paddle pop sticks and bottom magnet in place)* The magnet which we put next didn't touch the other magnet. When we turned it over it stucked *(sic)* on the other.
Milad	*(accompanied by a diagram)* The second magnet did not touch the first magnet. Then we turned the second one over and it stuck to the first one.
Emily	The magnet which we put over the cradled magnet was hanging in the cradle. When we turned the magnet over it stuck to the other magnet.

Comment

These texts, following on from the teacher's questioning in the previous episode, provide another context for the students' use of more decontextualised language. As would be expected from the task, they have some of the characteristics of simple recounts: specific participants, use of the past tense and a temporal sequence of events. They assume, however, considerable shared knowledge on the part of the reader. There is no orientation and therefore no previous referent for *the magnet* in *the magnet which we put next, the second magnet, the first one, the magnet which we put over the cradled magnet.* However, the purpose of these texts was for the students to record what had happened in their own experiment, in order to remind them later of what had happened, and the texts are adequate for this purpose. Emily's text, and the reference to the 'cradled' magnet, appears to have been influenced by the written instructions which accompanied the task, (discussed in Part 1 of this chapter). It is interesting that she has not chosen to include a diagram. Emily was by far the most competent English speaker in this group, and the demands of this more decontextualised recount text are well within her English capabilities: a diagram would presumably have served no purpose.

These texts will later be compared with writing which students produced later in the sequence of episodes (see 5.38).

Text 5.29

(The group is recalling what happened in their experiment in preparation for reporting back to the class.)

	STUDENTS	
1	Emily	we have to talk about what we did last time and what were the results . . . .
2	Milad	we got em . . we got a . thing like . . this . . pu- we got paddle pop sticks and we got
3	Maroun	we put them in a pot
4	Milad	and have to try and put
5	Julianne	wasn't in a pot/ it's like a foam . . .
6	Milad	a foam
7	Emily	a block of foam
8	Julianne	and we put it
9	Emily	we put paddle pops around it . the foam/ and then we put the magnet in it
10	Julianne	and then we got
11	Emily	and then we got another magnet and put it on top . and it wasn't touching the other magnet . . Maroun your go

12	Maroun	when we.. when we turned it the other way . . it didn't stick on because . . . because
13	Julianne	because?
14	Maroun	because em . . . . it was on a different. side
15	Milad	Emily your go
16	Emily	OK . last week we . . . we . . . . did an experiment . . . . . we had a . em a block of foam and we um . . stuck paddle pop sticks in it and we put . . . a . magnet . a bar of magnet . . into the em cradle that we made with the paddle pop sticks=
17	Milad	that's enough from you . .
18	Emily	=then we put another magnet on top and the result of this was . . . the magnet that we put on top of the cradled magnet did not . stick to the other magnet
19	Julianne	then when we turned it around . when we turned the other magnet around it it
20	Maroun	stuck
21	Milad	it stuck together because
22	Maroun	and it stuck together because . it was
23	Emily	it was on a different side
24	Julianne	it was on a different side and the other one's and . . .
25	Emily	and the poles are different
26	Julianne	and the poles are different
27	Milad	and em when . . we put on the . . . side it stuck together . . .
28	Julianne	because em it was on different sides/ because we put it on the on the 'thin side and it didn't and we didn't/ it didn't 'stick . .
29	Maroun	because the flat side is stronger than the thin side?
30	Emily	no/ because the poles are different
31	Milad	because the poles are different alright?
32	Julianne	we/ we finish

Comment

The jointly constructed nature of the text is evident in the overlapping speech (6/7; 10/11; and 22/23/24) and the occasions where a clause is begun by one student and finished by another (22 - 23 and 24 - 25). It is through this process of joint construction that the wording is gradually refined towards more explicit and written-like language. While the notion of comprehensible output refers to the language produced by an individual, the nature of the talk here suggests that this is exactly what the group *as a whole* is striving for, and the process occurs via the participation of individual members. (The relationship of comprehensible output to group talk is taken up further in Chapter 7.) Here it is impossible to unravel any one student's contribution as the source of the information, or to regard any one contribution as a solo text. An understanding of meaning as a joint construction, sometimes with the shifting and ambiguous patterns of meanings which Maybin (1994) refers to as "provisional meaning", is necessary to interpret texts such as this.

In this text there is also clarification of the scientific concepts inherent in the experiment, as ideas are taken up and expanded by the group. Three speakers contribute to the development of information here:

> it got stuck together because it was . . .
> on a different side . . .
> and the poles are different.

and there is further clarification as the students decide the reason for magnetic attraction:

> we put it on the thin side . . and it didn't stick
> because the flat side is stronger than the thin side?
> no because the poles are different
> because the poles are different alright?

This text suggests the pedagogical value of this kind of discourse, in which both language and science learning are embodied. Telling others what they know allows the children to recognise the gaps in their own understanding, and pushes them to clarify thinking and to engage in 'literate talk' (Chang and Wells 1988). At the end of this episode, one of the students asked the teacher, *can we have another practice,* suggesting that the students also valued the opportunity to talk in this way.

However it is important to recognise that such discourse was the result not simply of a functionally 'empty' classroom exercise, but the result of a real and shared purpose for the students, who knew that one or more of them would be expected to share their learning with other members of the class. The text must also be seen in its relationship with the overall classroom organisation and the inbuilt 'information gap' which existed between the groups. The students who participated in this text were in the position of 'experts' in relation to their peers, with the expectation that what they chose to say would be heard as new information by their audience. Thus it is not in the discussion activity *per se* in which the pedagogical usefulness of such discourse lies; the text must also be located within the broader context of ongoing classroom discourse, and viewed in the light of its social purpose and its relationship to the overall organisation of learning activities.

Text 5.30

(The group is joined briefly by the teacher.)

	STUDENTS	TEACHER
1		how did we go?
2	we finish	
3	yep	OK so you've said/ described what you did and you've described what your results were
4	yes Miss	
5		OK/ you've remembered that your language has to be really precise because the other children have got to try and get a picture in their mind of what you did
6	Miss can we have another practice?	
7		you certainly can . . .

Comment

At this point the teacher's initial contribution to the group's discourse is not to do with the construction of science knowledge but with the group work procedures the students have followed. She checks that the students have described what they did, and what the results are, both of which they will be expected to talk about in the reporting session which will follow. Turn 5 represents a field switch, (illustrating the notion of different fields discussed in Chapter 4). The primary field at this point is language; the metalinguistic talk here follows from a reference earlier in the lesson to the needs of an audience who has not shared in the speaker's experience (see text 6.8 for further discussion of this point). In her earlier talk with the group (text 5.27), we saw how the teacher's probing questions helped students produce a less context-dependent text. Here, in turn 5, her purpose is similar, but she uses metalinguistic talk to fulfill it. Whereas in the earlier text her focus is language *use*, knowing how to use language, here her focus is language usage, knowing about language. This example illustrates how a context involving actual language use can also provide a context for talking *about* language.

Text 5.31

(The group has a second 'rehearsal' for the reporting session.)

	STUDENTS	
1	Emily	OK we're each going to have a go at saying it
2	Maroun	what's what's 'results?(*asking for meaning of word*)
3	Julianne	the results?
4	Emily	what happened

5	Julianne	what happened at the end like . what happened when we put the magnet on top of
6	Milad	yeah at the end
7	Julianne	in the beginning . . . . .
8	Emily	OK well what we did first there was
9	Maroun	we will start with Emily
10	Julianne	in the beginning
11	Emily	what we did first was . we . had a em block of . foam and we put paddle pop sticks in it to make a cradle . . and then we got a . em a magnet . . and we put it inside the cradle/ then we got another magnet and we put it on top of the cradles (*sic*) magnet and . the magnet that was on top of the cradled magnet did not stick to the . cradled magnet
12	Maroun	I think because it didn't stick/ because it was . because we we turned it on other /the other side because
13	Julianne	'then we turned the magnet onto the other side and it couldn't stick
14	Maroun	yes it did!
15	Julianne	no it didn't/ we turned it on the other side

Comment

In this text the shared reporting process is repeated. This time the discourse has less of the quality of a brainstorm, students contribute fewer ideas individually, and there is little overlapping speech. In comparison with the characteristics of the previous text, this text is less obviously jointly constructed. Perhaps this is because the students are becoming more confident in their individual abilities to report back; however as this text is so short it is difficult to hypothesise further. The text begins with one student asking the meaning of *results (2)*, which refers back to the last turn by the teacher in the previous text. Other students define this as *what happened (4); what happened at the end; like what happened when we put the magnet on top (5)*. This suggests an ability by the students to shift into a more everyday register, and to exemplify meaning through a particular example, echoing the same kind of strategy that the teacher had used in explaining written instructions, (see Part 1 of this chapter).

Text 5.32

(*Teacher-guided reporting, teacher with Julianne*)

	STUDENT	TEACHER
1		OK/ what did you do . .
2	J: what's that called (*pointing to polystyrene*)	
3		what's that/ that's polystyrene/ foam is another word

4	J: we put paddle pops around the foam and then we got a magnet and we put it in . and we got another magnet and we put it on top but it wasn't touching the other magnet . and then when we turned it around . it attach together/ the two magnets . and when we put on the side they em attach together	
5		OK so when you say the first time/ you said that you put the magnet and it wasn't attached or it didn't attract to the other magnet/ what was happening/ at that time/ the first time . . you put the magnet in the cradle
6	J: it was em on the top of the other magnet/ it wasn't touching it . . .	
7	J: no	so was it just sitting on top of it directly on top?
8	J: it was just like on top of it like that (*demonstrating with her hands*)	
9		so it was like floating above it?/ OK that's interesting alright/ that's what happened the first/ tell us what you did then
10	J: we turned it around and they got stuck together	
11		so you turned/ which magnet did you turn around?
12	J: em the one that was on the top	
13		OK and then what happened
14	J: it touched it	
15		OK it attracted . . together . it attached together/ interesting OK/ let's hear what the other group did/ thanks Julianne

Comment

Julianne presents her recount almost without hesitation, but as in text 5.3 discussed in Part 1 of this chapter, the teacher chooses to unpack the account into several stages: *so when you say...* (5); *so was it just...* (7); *so it was like floating...* (9); *so which magnet...* (11); *and then what happened* (13). The teacher's responses stay close to Julianne's meaning: for example, *so* provides a cohesive link within each exchange, and reflects the semantic link between student and teacher wording. But from the point of view of communicative need, this probing seems redundant, since the teacher clearly understands the student. Here for example the student's initial wording — *it wasn't touching the other magnet* — seems to be unnecessarily problematised by the teacher: *so what was happening*. The student repeats what she

said earlier: *it was on top of the other magnet, it wasn't touching it.* Again the teacher clarifies apparently unnecessarily: *so was it just sitting on top of it?,* to which the student responds by demonstrating the movement with her hands: *it was like on top.* This is perhaps the cue that the teacher is waiting for which allows her to draw out from the discourse what she sees as significant: she recasts (*it was like floating above it*) with a final comment pointing to the significance of this in the experimental procedure as a whole: *that's what happened first.* Only at this point does she allow the discourse to move on: *tell us what you did then.* It can be seen, then, that there is considerable communicative redundancy in this piece of discourse.

However much classroom talk has a pedagogical as well as a communicative purpose. The breaking down of the retelling by the teacher allows the student the opportunity to reformulate the wording, as well as to clarify her thinking. It also takes into account the listening needs of the audience: the communicative redundancy decreases the listening demands on them. The teacher's role in the discourse is therefore not simply to recast student wording or to mediate between personal and public understanding, but also to control the pedagogical *direction* of the discourse. While in this text she is in one sense 'leading from behind', in that her responses follow on from the meanings the student has initiated, she is also taking the lead in inserting into the discourse her own contribution about what is significant, while at the same time seemingly eliciting the information from the student.

In pedagogical terms, the teacher's responses are of course not simply for the benefit of the student, nor does it seem likely that she has actually misunderstand the student. Clearly the responses are for the benefit of the listeners too. The notion of teaching as 'performance' which this suggests is taken up in Chapter 7.

In the following five texts (5.33 - 5.37), the teacher and students together begin to build a common framework into which individual contributions are drawn together.

Text 5.33

	STUDENTS	TEACHER
1		OK so the the force of it turned it around and it attached/ 'interesting/ OK . so a 'little bit different to Charbel's group. did you find Charbel's group that it it turned the other magnet around?
2	yes	
3	oh yes	
4	it turned and touched it **	
5		it did as well/ it turned it around/ excellent OK you need to be thinking about the 'why.

Text 5.34

STUDENTS	TEACHER
yes	have you started to think about that . . for the first experiment. when we had the two lying down . . . one in front of the other . . . they * they attached to one side but when . the magnet was turned around . it didn't attract or it didn't attach . . Fabiola said the same thing in her experiment . . . one pole was attracted . to the one pole . on the 'floor but when it turned around it didn't/ OK interesting . the same group who did that was Duncan's group was it/ Duncan would you like to tell us your results? were they . similar . or did you find out anything different.

Text 5.35

TEACHER
attached straightaway/ mm 'interesting/ thank you Andre . . so same results again as the other group . . . . when it was facing one way you couldn't get it to . attract to the other magnet/ but as soon as the magnet was turned around . it attracted straightaway . .

Text 5.36

	STUDENTS	TEACHER
1		OK so you changed . the bottom one to change the pole/ that's the same/ would you say that they were the same results as the other group?
2	yes	

Text 5.37

	STUDENTS	TEACHER
1	ohh *(several)*	OK thank you . . . three experiments and you all did very well/ three experiments/ three experiments . . . . . and if you'd listened carefully . . . you could find that there was something in common . . . with the results
2	ohh	of all three experiments
3	oh Miss Miss	
4	Miss	
5		there's something in common if you listened to the results and the descriptions . . that were used. and that was similar in all . three . experiments. Janet would you like to tell us what you think
6	em Miss when they first put the magnet em on one side . . em it attracted . but em repelled . . and the next time they did it they put the magnet on the other side and some of the repel/ the * that did it the first time it repelled em it attracted next	
7		OK so there was /like an opposite . OK why/ why do you think that might be happening/ she's exactly right . . where the groups put the two magnets together and they found out they either attracted . they turned it round and then they repelled . . or . they repelled first of all . they turned around and attracted/ the magnets attracted to each other/ Andre?
8	em because Miss . the . magnet which you put on the other magnet which you turned around . . it's not the . . like it wouldn't stick to it because . it's it's the wrong one . . and it can still feel . . the.. other side of the . thing so it turned around and it touches to it	mmm
9		what do you mean the/ what do you mean the wrong one/ it was interesting that you used the language 'the wrong one'
10	Miss the one like	

11		difficult to explain I know/ because I know exactly what you mean/ we're just trying to find the 'language . to explain
	several turns later	
12		Diana
13	em the the em the magnets have different sides/ one that attaches and the other one that goes away and when you put the the/ two that attach togeth-/the the both sides that attach together they will attach together / but if you turn 'one . you em . would go away and turn to the other side when it attach	
14	Miss like when people hold the em the norths together . like they turn around . each other	

Comment

This group of texts show how the teacher begins to guide students to understand the significance of what they have been doing, and how she ensures that her understandings become jointly shared understandings. While clearly controlling the discourse here, the teacher also continues to acknowledge the 'expertise' of the groups and name them as the source of the information:

> did you find Charbel's group that it turned the other magnet around? (5.33)
> Fabiola said the same thing in her group (5.34)
> Duncan . . were they [results] similar? (5.35)
> so same results as the other group (5.36)

The teacher also inserts into the discourse what she wishes the students to see as significant, reminding the students about a key understanding:

> when we had the two (magnets) lying down... they attached to one side but when the magnet was turned around it didn't attract (5.34)

> when it was facing one way you couldn't get it to attract but as soon as the magnet was turned around it attracted straightaway (5.35)

It is interesting to note that while the students are named as sources of information (Charbel, Fabiola, Duncan), the information itself is now beginning to be foregrounded in the teacher talk. Human participants are beginning to be absent

from the text, and the actor — the 'doer' of the experiment — is left implicit in the passive form of the verb:

> they attached to one side but when the magnet was turned around it didn't attract (5.34)

> as soon as the magnet was turned around it attracted straightaway (5.35)

The clause themes are now non-human participants from the field of science. The following pairs of texts from episode 23 provide further example of the mode shift that is evident in the discourse as a whole. Compare, for example, the change of clause theme, and consequent recoding of the processes, as a result of the mode shift from the first to the second text in each pair.

> *Individual student reporting on the group's findings*
> then when we turned it around it attach together

> *Later, teacher summarising results*
> (as soon as) the magnet was turned around it attracted

> *Individual student reporting on the group's findings*
> then we moved one to the other side and then the other one was sort of pushing it away and we turned it around... and when you turned around the other it stuck to the other one.

> *Later, teacher summarising results*
> they attached to one side but when the magnet was turned around it didn't attract

There are clear implications here for the importance not only of 'making sense' of individual activity, but also of placing individual recodings of personal experience into a larger framework of meaning. It has been suggested in Chapter 2 that it is the enculturation of students into this larger framework of meaning that largely constitutes the business of school; in the absence of this framework Edward and Mercer suggest that individual discovery may, in cognitive terms, lead nowhere:

> when teachers go out of their way to avoid offering to pupils help in making sense ... of experiences, the consequences may be that the usefulness of those experiences is lost.
> (Edwards and Mercer 1987, p. 169)

In text 5.37, the teacher asks what the students could find in common with the results of all three experiments. Janet (6) appears to recognise that this is no longer a reconstruction of what students did. She avoids naming specific groups, but the human participants remain, (though coded somewhat less specifically), as *they*. Andre's response (8) begins more appropriately with *the magnet which you put on the other magnet*, and he makes the interesting remark, picked up on by the teacher, that the magnets do not stick because *it's the wrong one*, (the wrong pole), adding that the magnet *can still feel the other side* (is affected by the other pole). Here there is evidence of some understanding of the magnetic processes at work, which the teacher affirms, at the same time foregrounding the role that language plays in the construction of meaning: *I know exactly what you mean/ we're just trying to find the language to explain it*. The final contribution comes closer to the generalisation the teacher is seeking. As with Janet, this student appears to recognise that the kind of response that is being asked for requires a distancing from the recount of an individual experiment, but her attempt relies on a reference to *people*, (which she simply substitutes for a reference to *we*) rather than a recoding of the information itself.

In the following text (5.38) the discussion around commonalities continues, leading to the students making some generalisations about magnets.

Text 5.38
(*Constructing generalisations*)

	STUDENTS	TEACHER
1	B: when you press two magnets together it attach	
2		so if I place that (*demonstrating*) to that (*demonstrating*) it attracts/ what about if I put that one (*reversing the poles of one magnet*)
3	B: when you turn one magnet around it doesn't attach together but/ cos it turns around by itself	

4		if I put the/ those two ends together (*demonstrating*) place two ends/ they're actually repelling/ Julianne?
5	J: it doesn't attach	
6		(*turning one magnet around*) but they are attaching/ there now
7	A: oh Miss	
8		Andre?
9	A: because you turned the . . you turned the one of the circles to the other side . . like to the blue one	
10		there's a circle there and no circle . . .
11	A: if you turn the circle around it won't attach	
12		it won't attach . . if I turn that circle because . why
13	A: because Miss they're both/ like/ the north	

Later in the same discussion

14	An: if you put the south and north together then em they will . . attach but if you put north and north or south and south together . . they will not attract	
15		so if the poles are the same . . they will repel however if the poles are different. they will attract well done/ thank you/ exactly what happened/ Maroun
16	M: when you put two magnets on . on north north they won't stick together . .	
17		north north (*demonstrating*) no they won't/ is that it? OK/ can you add anything else to it/so if you put two magnets . . . with like poles together . . they won't stick/ they won't attract/ well done/ Robert
18	R: the north pole and the south pole . . attract . whereas the north pole and north pole repels	
19		well done/ that's exactly what happened/ you joined those two together didn't you/ *whereas*/ some people used different sentences/ let's try again/ let's listen to it again
20	R: the north pole and the south pole attract whereas the north pole and the north pole repels	

21		like poles repel *(nods to Charbel from another group)*
22	C: Miss it's something like Robert's	
23		that's OK if it's similar that's because we got the same results .
24	C: em the north pole and the south pole attract each other whereas the north pole and the other north pole repels	
25		well done/ that's exactly what happens/ you used *whereas*/ the same connective there/ well done

Comment

The students are beginning to make clear generalisations about the results of their individual experiments, see for example the first speaker (1). In the earlier part of this discussion the teacher still makes use of the science materials so that she can visually represent the meanings of the students, as she did when helping them to understand written instructions. Here the action of reversing one of the magnets, which she repeats, also makes salient to the students the process she wishes them to think about (2, 4, 6). The demonstration elicits from Andre an explanation (11, 13), which later forms the basis of the scientific principle involved, which Andrew begins to formulate (14), and which is developed by other students (16, 18, 24).

Turns 14 and 15 provide further exemplification of Lemke's argument, alluded to earlier, that teachers should provide their students with alternative ways of expressing the same semantic relations (Lemke 1990a). Andrew states the scientific principle in one way, the teacher in another, and, as Lemke recommends, she makes clear that the meanings are equivalent, here by connecting the two versions with *so*, and by the closing comment *exactly what happened:*

	STUDENT	TEACHER
14	An: if you put the south and north together then em they will . . attach but if you put north and north or south and south together . . they will not attract	
15		so if the poles are the same . . they will repel however if the poles are different . they will attract well done/ thank you/ exactly what happened/ Maroun

The text again illustrates how metalinguistic knowledge can be developed in tandem with knowledge about science. The teacher focuses on a specific grammatical item: *whereas*. When Robert uses this (18), the teacher draws the students' attention to the fact that Robert *has joined those two [sentences] together while other people used two different sentences* (19). She asks him to repeat what he has said, thus making clear to the students that she considers Robert's response to be significant. Here the teacher is focusing explicitly on language form; the text illustrates how a focus on grammar can occur in the context of actual language use, and in the service of the learning of subject content. The teacher then returns to a focus on the message itself and offers a further recast of what Robert has said: *like poles repel* (21). Charbel is then nominated but appears reticent because *it's something like Robert's* (22) to which the teacher responds by reminding him that *we got the same results*, thereby also reminding the students of the point of the discussion they are involved in, namely to identify the common principle in the experiments. The teacher again comments on the use of *whereas*, this time naming it as *the same connective*. (The children were familiar with the metalinguistic term *connective*.) This connective is later taken up by one of the students in the writing that followed this discussion.

Following the discussion the children wrote in their journals. Four examples are included here. For the purpose of comparison, to show how the discourse has shifted from personal recount to generalised principles, the earlier written texts from 5.28 are included again.

Texts 5.39

	Earlier text (5.28)	Text after discussion (5.39)
Julianne	The magnet which we put next didn't touch the other magnet. When we turned it over it stucked on the other.	All magnets have a side which repels and a side which attracts. Magnets don't stick if you put north with a north or south and a south but if you put a south with a north they stick.
Milad	The second magnet did not touch the first magnet. Then we turned the second one over and it stuck to the first one.	When we turned the pole to the north and north they won't stick. If we put north and south they will stick together.
Emily	The magnet which we put over the cradled magnet was hanging in the cradle. When we turned the magnet over it stuck to the other magnet.	Magnets have two poles. A north pole and a south pole. If we put the south pole with the north pole they stick together. When you put N with N or S with S they repel.

Andre	The bar that was on the string was trying to find the pole that atract the one that was on the ground (*sic*)	The north pole and the south pole atch together wher as the north pole with the outher north pole repels (*sic*)

Comment

Each pair of texts mirrors the movement which has occurred in the ongoing spoken discourse, from personal recount to a generalised principle. Julianne's two texts show this development clearly: the first is a personal recount and the second begins to approximate a report. Human participants are included in the first text, and appear as themes. Participants, both human and non-human, are specific, and the text is sequenced temporally as would be expected in a recount: *next, when.* 'Everyday' rather than scientific terms are used: *didn't touch, stucked.* The second text has no temporal sequence; the participants are generic (if *you* is read in the generic sense of *one*) and the non-human participants are the major themes of the clause complex: *all magnets, magnets.* The processes are coded appropriately as *attract* and *repel* (although this is not consistent).

Milad's texts are less distinct from each other. The first text is clearly a recount, with reference to *we* as the actor in the situation, with the temporal sequence noted in Julianne's text. The second text begins in much the same way. However there is some evidence of the development of a more generalised hypothesis: *if we put north and north they will stick together.*

Emily's first text is also a sequenced recount. There is little specific field lexis, with the magnets being described as *hanging* and *stuck.* Her second text begins with a generalisation about magnets, and there is a clear attempt to sequence the information as an explanation. Most of the text participants are nonhuman and generic (note that *we* and *you* could be read as generic), and some appropriate field lexis is evident: *north pole, south pole, repel.*

Andre's two texts also reflect a mode shift, although the first text of the pair does not contain himself as an actor, as the other early texts do. Instead *the bar on the ground* is represented as actor, although the process is essentially a human one: *trying to find.* The second text is a clear generalisation. It is of interest too because the use of *whereas* shows evidence of uptake from the previous discussion. Andre is seen by his teacher as a fairly low level student in terms of English language development, and his teacher commented that she would not have expected him to have used this comparatively sophisticated language. Although no generalisation

can be made from this single example, it appears likely that Andre's text was influenced by other students' interactions with the teacher which he had listened to.

While all the final written texts indicate some development of the subject register, it cannot be argued that this is solely the effect of the interactions in which the students had been engaged between the writing of the two sets of texts: causality cannot be assigned to a single pedagogic component. However, the written texts should be seen as reflecting the mode shift towards a more scientific register that is characteristic of this series of episodes as a whole. They are congruent with the pedagogical direction that the discourse is taking, and exemplify how the particular choice by the teacher of each of the writing tasks was in itself part of the context of the discourse. The written texts also reflect the nature of the writing task itself: as Halliday (1978, 1984) argues, language is the way it is because of what it does. The first of each of the students' texts was written as a recording of the experiment which they had just completed, and the teacher had pointed out that the purpose of this was to help students remember what they had done the following week. The recordings were to be "as accurate as possible". With this purpose, it would be likely that students would produce a text with the characteristics of a recount. The second text of the pair, however, came after the teacher-guided reporting, and the task for the students was to write a statement or generalisation from the experiments.

Thus while direct causality between teacher-student interactions and the written texts is not being claimed, it appears likely that the students' written texts were influenced by their interactions with the teacher. The written texts are embedded in the discourse in which they had taken part, and it would appear unlikely that such writing would have been produced *without* the discourse which led up to and surrounded it. As Wells writes:

> In educational settings ... work on written texts is often at or beyond the individual student's level of solo activity, yet is frequently undertaken alone. In such cases talk plays an extremely important role in establishing and maintaining the community and in providing an informal network of mutual support and assistance; it is also the medium in which the teacher can help to build bridges of understanding between the students' spontaneous, dynamic mode of construing their

> new experiences and the more difficult, because less familiar, modes of the literary and synoptic texts they are learning to read and write.
> (Wells 1994a)

PART 3: IMPLICATIONS FOR PEDAGOGY: MODE SHUNTING AND LEARNING

In each series of texts from the two classrooms, the discourse has been shown to move gradually closer to the more formal and public discourse of school science. This sequence, from more to less context-embedded talk, begins with activities in which the most contextually appropriate talk is the familiar and day-to-day. Many of the exchanges in such situations are action exchanges, and since the talk incorporates exophoric reference, there are in general comparatively few demands made on students' linguistic resources. With the help of the teacher, particularly in those episodes which incorporated teacher-guided reporting, the discourse is refashioned to incorporate more of the features of written language: the discourse begins to be more explicit, and does not immediately take shared assumptions for granted. The talk in the teacher-guided reporting episodes has many of the characteristics of written discourse, attributes such as explicitness, connectivity and coherence, and justification (Chang and Wells 1988). Such 'literate' talk is involved in giving a clear description, an extended argument or an explanation. In these classrooms, the process of recasting by the teacher supported the students in using more literate talk, and ultimately in producing successful written texts. The talk with the teacher also resulted in students' individual ideas and ways of knowing being linked to a larger framework of meaning; the voice of the individual begins to shift towards the public discourse of the discipline. In linguistic terms this is reflected in changes in clause themes, (for example, from *I* and *we* to non-human and field specific text participants); and in an increase in the percentage of exchange structures which give information, rather than control action. Talk with the teacher functioned as a bridge into this more written-like mode.

If the learning sequence in the two classrooms, from more to less context embedded linguistic contexts, is compared to more traditional ESL and EFL programs, some differences are apparent. Frequently in such programs, a learning sequence begins with some formal study of grammar or vocabulary, which is then followed by opportunities to practice the target language, in increasingly less teacher-controlled

contexts. By comparison with this approach, students in the two classrooms moved *towards* the target text, and no attempt was made to present the more formal register ahead of the students' personal understandings of the science being taught. In fact, in both of the programs, most attention to language was given at later rather than earlier stages of learning.

In addition, in many ESL/EFL programs the language is 'contextualised', only in the sense that the *setting* (often imaginary) is presented to the students. That is, context is equated with setting. In the two classrooms discussed, context includes not only the immediate (and real) situational context, but the dynamic context which has been built up over the course of the 'long conversation'; meanings are made in the light of shared and jointly built-up understandings. In this sense, every piece of language 'means' in terms of the ongoing story known and shared by the classroom community.

The analysis thus suggests the intertextuality of classroom events: "everything makes sense only against the background of other things like it" (Lemke 1990a, p. 204). In these classrooms, the discourse of each new episode was constructed by teacher and students out of the context of previous and familiar thematic patterns of semantic relationships, and 'heard' within this context. The context at any point in time both produced, and then was subsequently changed by, each new episode. Thus the discourse of each new episode contains traces of earlier voices; as Bakhtin and others have suggested, words always carry with them some of the meanings of their earlier users (Bakhtin 1981, 1986; Maybin 1994). In Mercer's words, "the talk itself creates its own context; what we say at one time in a conversation creates the foundation for meanings in the talk which follows" (Mercer 1995, p. 68). In this sense, content and meaning are not givens but "are negotiated and renegotiated in the face-to-face interactions among members of a group at particular points in time" (Floriani 1993, p. 255).

In the content classroom, the dynamic perspective on context which this notion of intertextuality suggests, acknowledges the changing reality for learners: participants within a sequence of events have a different sense of what and how things mean at different points in time. From a pedagogical perspective, it is the ability of the teacher to *recognise* how things mean to students at a particular point in time, to be able to stand outside her own adult thematic framework and history, to 'read' the context through the eyes of her students, that enables her to respond contingently to their contributions to the discourse.

This view of context extends far beyond the notion of context as 'setting'. As Mercer points out:

> 'context' is not simply those things that exist around the talk, the physical objects and so on; it is those things beyond the words being spoken which contribute to the meaning of the talk.
> (Mercer 1995, p. 68)

Edwards and Furlong similarly suggest:

> Talk is not one distinct item after another. It involves what has been called "conditional relevance": the meaning of an utterance arises partly from something else that has been (or will be) said, perhaps some distance away in the interaction.
> (Edwards and Furlong 1978, p. 41)

There are both theoretical and pedagogical implications of taking the dynamic view of context suggested here, rather than a more static, synoptic one.

From a theoretical perspective, a dynamic view of context points to the value of analysing classroom discourse as a single 'long conversation'. An understanding and analysis of the local moments of learning requires a recognition of how they have been influenced by prior events, contexts and texts (Gilbert 1992; Floriani, 1993). In addition, a dynamic view of context shows more clearly its significance for language learning: the 'long conversation' facilitates students' understanding and use of new forms of language and thematic structures. An understanding of the dynamic nature of context consequently suggests a much richer notion of what constitutes comprehensible input, a point which is taken up further in Chapter 7.

From a pedagogical perspective there are clear implications for the structuring and sequencing of learning activities in content-based programs: teaching programs need to be considered in terms of how far they have provided sufficient thematic contextualisation for students to understand, and make use of, new curriculum 'content', and the language forms by which it is realised. In the two classrooms, multiple sources of understandings were available, since it was not only the visual and concrete situation, the 'here and now' context, which students could draw on, but a 'mental' context, the story to date. Students' schematic knowledge thus

supported their understanding of new language, and new language could then be 'pegged' to what was already known and familiar.

The existence of the 'long conversation', and the use of language for authentic purposes, such as reporting to others, was in large part due to the fact that English was the medium for learning other things. In classes where the primary aim is the learning of language itself, contexts often have to be 'invented', and the purposes for using language, and its field or content, exist only through this invented context. For example, a language game where students must imagine they are marooned on an island, and must come to a consensus about what things they need to survive, may provide opportunities for the practising of specific language structures, but does not have the potential to create the dynamic contexts in which language is being used for authentic and ongoing purposes, such as the learning of science. By contrast, the texts in this chapter show how the language which the learners produced had embedded within it traces of previous events and processes that helped shape its existence; such traces indicate how these prior events serve as a resource for language development. In the language game in the example above, learners are unlikely to have such a 'long conversation' to draw on: they are effectively robbed of a potential resource which could support them in understanding unfamiliar language and producing new texts. Perhaps the language learning potential of the 'long conversation' is one of the strongest arguments for content-based language learning for ESL children, especially when that content is the mainstream curriculum itself.[2]

The chapter also illustrates how different episodes create very different contexts for language use and how these contexts result in very different language outcomes, (as shown by a comparison between the register of the students' writing and the talk which typically occurred at the beginning of the unit). In a year long study aimed at discovering critical variables on school ESL learners' academic achievement, Saville-Troike (1984) suggests that communicative activities and social interaction between students may not alone be sufficient to develop English language and academic skills, and identifies vocabulary knowledge as a highly significant factor, (a point which Cummins' argument for the development of academic registers also serves to underline). Texts produced in the experiential group work suggest that this is not a surprising finding — subject specific language is simply not necessary for communication between the interactants; what was

[2] The proviso here being that the teacher understands the potential of the curriculum as a resource for language development.

most important to the participants was social communication. In program planning consideration must therefore be given to the *probability* of the target language actually being used in particular activities. The mere use of scientific materials does not guarantee that scientific lexis will be used; on the contrary, the use of such materials in a face-to-face context is likely to obviate the need for it. Thus design of tasks must take account of the relationship between text and context. For children learning curriculum content through the medium of their second language, it is particularly important to consider whether action or information exchanges are most likely to be foregrounded in a particular task; how explicit and field specific the discourse needs to be for the purpose of the task; and what opportunities there are for students to use more explicit spoken discourse, 'literate talk', prior to related writing tasks.

Teaching in the content classroom must also take account of the fact that students have to understand and develop curriculum knowledge as well as develop their second language. It has been suggested that the integration of concrete experience, appropriate language teaching and purposeful learning, which helps the learner go from known to unknown, goes hand in hand with the teaching of science (Dalton and O'Toole 1987; Dufficy and Foster 1988). Lemke's comments (1990a) are also relevant here. For students to understand science, he argues, teachers should show respect for the 'commonsense views' of their students. To return to the words quoted at the beginning of this chapter, "we do not want students to simply parrot back the words we have said ... if you can't say something in more than one way, you have only memorised it". This chapter has shown how teachers and students together said things "in more than one way". It has also shown how students' commonsense views (and everyday language) were recast into more scientific ways of meaning, both within individual exchanges and across a series of episodes. It would appear likely that such a starting point increases the likelihood of "getting past a set of words to a meaning", since particular (scientific) wordings are constructed out of students' meanings: in other words, these meanings become the catalyst for the introduction of aspects of the scientific register and for the understanding of scientific principles.

Through the study of the mode shifts within and across teaching episodes, this chapter suggests the potential role of mode-shifting in curriculum and second language learning, and helps to provide a linguistic perspective on understanding the nature of the dynamic context of the classroom.

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A thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy

VOLUME 2

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Faculty of Education University of Technology, Sydney

June 1999

CHAPTER 6

The Teachers: Teaching as Mediation

It is essentially in the discourse between teacher and pupils that education is done, or fails to be done.
(Edwards and Mercer 1987, p. 101).

INTRODUCTION

Issues to be addressed

This chapter focuses on the role of the teacher in student learning, theorising this in neo-Vygotskian terms. As discussed in Chapter 2, the teacher's role has been characterised in a variety of ways, depending on particular pedagogical orientations which differ largely in the extent to which the teacher is seen as retaining primary control over the discourse of the classroom. This earlier discussion is briefly summarised here. One dominant western instructional model suggests that teachers 'deposit' skills and knowledge in the blank memory bank of their students. Such an orientation sees the teacher as the holder of knowledge and of power, and the students as the passive recipients of that knowledge. Language in this model is a 'conduit' for the transmission of a specific body of knowledge which it is the teacher's responsibility to impart and the students' to receive. The teacher retains control of both power and knowledge in the classroom through her interactions with students. In contrast to this orientation is the 'progressive' model historically associated with Dewey and now closely associated with the 'whole language' movement. Progressive orientations emphasise the centrality of the individual student, and the processes of learning. Activity-based and individual 'discovery' learning is an important aspect of this pedagogical approach, with the teacher taking a largely non-interventionist role as 'facilitator' of student learning.

Both orientations have been critiqued from the standpoint of minority and second language learners. Transmission models tend to work against central principles of language learning since they restrict learners' opportunities for language use in communicative interaction; in addition they are criticised as presenting a curriculum sited solely within the dominant culture, and providing no opportunity for minority students to express their particular experiences and non-mainstream views of the world to peers and teachers (Cummins 1996). Progressive pedagogies have been criticised for their lack of explicit teaching (Delpit 1988), given the fact that minority students may not 'read' the implicit middle class curriculum on which the content and learning processes are based. Their focus on the teaching-learning relationship, and on the processes of learning, may not address the broader social realities which ultimately require students to control the language of power within the society.

These two orientations have tended to result in pedagogical practice being described, and frequently polarised, as either 'teacher-centred' or student-centred'. As suggested in Chapters 2 and 4, however, such terms are potentially problematic in that they present classroom practice as uniformly constant and unvarying. The reality is very much more complex, and as Chapter 5 demonstrated, if a *sequence* of episodes, rather than a single lesson, is examined, episodes vary considerably from each other in the degree to which they can be characterised as student-centred or teacher-controlled. In analysing the degree of teacher control, this chapter will suggest that notions of teacher and learner centredness need to take into account the context and the particular pedagogical purpose of particular stages in the teaching-learning sequence. It will be argued that particular patterns of interactions need to be *contextually justifiable* rather than evaluated for their learning potential away from the context in which they occur and their particular pedagogical purpose.

Avoiding such one dimensional descriptions of pedagogy as 'teacher-centred' or 'learner-centred', requires an alternative paradigm for considering the role of the teacher:

> . . . a model of the learning process which can accommodate the teacher as active participant (as opposed, for example, to a custodian of stimulating environments) and which, moreover, offers teachers a possible conceptual escape from the tired debate about 'traditional versus progressive' pedagogies.
> (Maybin et al, p. 187)

In line with the constructivist neo-Vygotskian approaches discussed in Chapter 2, and building on the previous discussion relating to mode shift, this chapter will take up the notion of teacher as active participant, and show how the teacher's role as 'mediator' is played out in her interaction with students, with particular reference to second language teaching in the content classroom.

As discussed in Chapter 2, Vygotskian theory is concerned with the mediation of culture. In the school context this process involves the cognitive and linguistic socialisation of students, as they are initiated by their teachers into the common knowledge which comprises educational discourse (Edwards and Mercer 1987). Webster et al define mediation as "helping children to construct events in terms they understand" (Webster et al 1996, p. 28). Effective teaching is not simply the transmission of information from one individual to another, but is a cooperative

and negotiated process. In Goodman's construal of teaching, the teacher involves students in learning through personal experience, and then uses these experiences to make sense of broader phenomena:

> In mediation the teacher tries to support the development of schemes which will move toward scientific understanding by involving students in experiences in which they will experience the forces at work, and bring their own inventions into their attempt to make sense of the phenomena.
> (Goodman 1991, cited in Wells 1992, p. 301)

An essential aspect of mediation is that through such cooperation, adults can help students accomplish tasks, (and we can include here ways of using language), which they would be unable to achieve alone:

> Spoken discourse has an essential role to play in mediating the pupil's *apprenticeship* into the discipline, both as a medium in which to respond to and prepare for work on written texts and . . . as an opportunity to 'talking their way in' (Halliday 1975) to ways of making sense of new information . . . in forms that, *with the assistance provided by the teacher*, gradually incorporate the essential features of the discourse of the particular discipline.
> (Wells 1992, p. 291, my italics)

Central to a view of teaching as mediation, then, is the recognition that learning depends on the nature of the dialogue between teacher and students, and the way that teachers construct the learning process itself.

The comments of both Goodman and Wells foreground as essential the support provided by the teacher in the apprenticeship process. Goodman argues that the teacher "support[s] the development of schemes which will move toward scientific understanding", and Wells writes of the "assistance provided by the teacher" through which students are led to "incorporate the essential features of the discourse of the particular discipline". In construing teaching as mediation therefore, it is necessary to consider the nature of this support. This requires the closely related neo-Vygotskian notion of scaffolding to be explored.

As discussed in Chapter 2, the notion of scaffolding is fundamental to a neo-Vygotskian theory of learning. It was pointed out in that chapter that a neo-Vygotskian perspective argues that it is only *when* teacher support — or scaffolding

— is needed, that learning will take place, since the learner is then likely to be working within their zone of proximal development. Vygotsky himself suggests that the only 'good' learning is that which is ahead of actual development (Vygotsky 1978). Scaffolding is thus the process by which a 'mentor' helps a learner know how to do something, so that they will be able to do it alone in the future. It is thus temporary assistance aimed at helping learners move towards new skills, concepts and understandings.

Webster et al (1996) argue that rather than tasks per se, it is the nature of the scaffolding within them which mediates understanding, and that this is largely instantiated through dialogue between teacher and students. Mediation and scaffolding are therefore not the same thing, rather, in the classroom, the teacher's scaffolding represents an outward manifestation of mediation in action, its realisation in practice. In short, scaffolding is the means by which mediation occurs. In this chapter, the focus is on how scaffolding occurs in spoken interaction[1].

A number of researchers have suggested that a distinction needs to be made between what counts as 'scaffolding', and what is simply 'help' (Maybin et al 1992; Mercer 1994; Webster et al 1996). Maybin et al suggest that scaffolding can be defined in quite specific ways:

> Scaffolding . . . is help which will enable a learner to accomplish a task which they would not have been quite able to manage on their own . . . which is intended to bring the learner closer to a state of competence which will enable them eventually to complete such a task on their own . . . scaffolding is the help given in the pursuit of a specific learning activity . . . To know whether or not some help counts as 'scaffolding', we would need to have at the very least some evidence of a teacher wishing to enable a child to develop a specific skill, grasp a particular concept or achieve a particular level of understanding.
> (Maybin et al 1992, p. 188)

They go on to suggest that two more stringent criteria for describing 'help' as 'scaffolding' would be, first, some evidence of a learner successfully completing the task with the teacher's help, and second, evidence of a learner having achieved a greater level of independent competence as a result of the scaffolding experience.

[1] It is not suggested that interactions provide the only context in which scaffolding can occur, (for example it may also occur through written models), but I will show that interactional scaffolding is a powerful form of scaffolding for second language learners.

Webster et al suggest that scaffolding provides a metaphor for the *quality* of teacher intervention in learning, again meaning more than just help to accomplish a task. It is aimed at a new level of student competence achieved through teacher support of student activities and problem solving, but without the teacher taking over, and actively assists learners to construct their own understandings (Webster et al, 1996). They suggest it includes marking out with students a specific line of enquiry and designing activities tailored to the needs and experience of a group. Scaffolding, which they also term 'dialogic teaching', is only effective when the teacher has a thorough knowledge of both the starting point of the learner, and of the field of enquiry, so that the teacher is able to explore the best ways of achieving the aims of the teaching program in relation to students' starting points. Thus what kind of help is given, and how, is dependent on the situational context of the task, not on a hypothesised psychological 'level' of the students.

A fundamental factor in effective scaffolding is the notion of contingency. This was referred to in Chapter 2 as the way in which the degree of help is *paced* on the basis of moment-to moment understanding, so that teachers allow room for learner initiative as a new task is grasped, but intervene when learners begin to falter. The importance of contingent responses was discussed in Chapter 2 in relation to second language learning, and to collaborative meaning making in language development. Webster et al suggest contingency is "arguably the most important quality for teachers to have in enabling children to take control of their own learning" (Webster et al, p. 151). The notion of contingency emphasises the importance of teaching strategies being based on and responsive to learners' current understandings. Halliday refers to the principle of filtering and the challenge zone whereby learners decide what is and what is not on their agenda. Contingent teaching takes account of what Halliday refers to as the principle of filtering:

> Children will attend to text that is ahead of their current semiotic potential, provided it is not too far ahead. They will tackle something that is far enough beyond their reach to be recognised as a challenge, if they have a reasonable chance of succeeding (cf. Vygotsky's "zone of proximal development"). Whatever is too far beyond their powers of meaning they will simply filter out.
> (Halliday 1993, p. 105)

Van Lier argues that contingency is easiest to achieve when interactants are oriented towards symmetry. Non-contingent discourse on the other hand

> is not anchored within the experiential world (including the here-and-now context) of all participants, nor does it set up expectancies for what is to happen next. Perhaps one person follows an agenda which the others are unfamiliar with, or what comes next is either totally unpredictable or totally predictable to one or more of the participants.
> (Van Lier 1996, p. 183)

Contingent interactions, then, are anchored within the experiential world and shared agendas of the participants. This chapter explores further the notion of contingency, drawing on the illustrative texts to define some of its features.

A final point to be made in this introduction is that it is perhaps ironical that while the empirical research on which neo-Vygotskian theory is based has concerned itself with the supportive intervention of adults in the learning of *individual* children, the development of the key concepts of the theory has not directly addressed the realities of the classroom, where, in most cases, one adult is responsible for the learning of large *groups* of children. It is not unproblematic, therefore, to directly apply many of the ideas which stem from a socio-cultural perspective to a large group classroom context (Mercer, 1994; Webster et al 1996). Mercer (1994) suggests that a coherent theory of teaching and learning as social practice has still to emerge, and likewise Webster et al (1996) suggest that the theory needs to be illustrated and extended with reference to how adults respond to children in busy school contexts. This chapter seeks to explore this issue further by providing such illustrative examples, and showing some of the ways in which the teachers in this study mediated learning through different types of scaffolded interactions. The texts have been selected because their interactional patterns and pedagogical purpose occur frequently in the data, but also because they offer a particular insight into the complex nature of scaffolding. They appear to meet the criteria for effective scaffolding outlined earlier, in that they are aimed at enabling learners to achieve an aspect of language use, or grasp a particular conceptual understanding, which they are not yet able to do independently. In most cases, there is also evidence of this successful achievement as a result of the scaffolding. The texts will be analysed to show how teachers, in their role of mediation, can actively support learning without recourse to heavily directed instruction, and also without recourse to the deliberately non-directive strategies that have at times been associated with 'discovery' learning and extreme progressive approaches.

The organisation of the chapter

For the purpose of the analysis it was important to be able to consider the relationship of form to purpose, that is, the pedagogical appropriateness of a particular pattern. Consequently the texts are grouped together in terms of pedagogical purpose, according to the stages of the teaching cycle or microgenre identified in Chapter 4. These are *Review and orientation* (orientation to the new learning which often involves the foregrounding of existing knowledge); *Setting up for new task* (when the teacher prepares children to carry out a new task, such as an experiment to test the effects of magnetic repulsion and attraction); *Carrying out the task* (when children carry out the task, in these classes, in small groups); and finally, *Reflection*, (when individual learning is shared, made public and discussed, and 'sense' is made of what has been done). Linguistically, as was pointed out in the previous chapter, this macrogenre incorporates teaching activities which reflect a movement along the mode continuum, from language as action to language as reflection.

As Chapter 4 discussed, this macrogenre or teaching cycle recurred several times throughout the overall topic, and so does not map onto the four or five week unit of work as a whole. Rather, each instance of the teaching cycle is made up of a related series of episodes which relate to a particular piece of learning or to the development of a concept, (for example, the understanding that opposite poles attract and like poles repel). Thus while the texts in each of the four groups (*Review and orientation, Setting up the task, Carrying out the task* and *Reflection*) share a similar overall pedagogical purpose, individual texts within the group may relate to different experiments. In terms of the interests of the study, grouping and analysing the texts in this way allows the possibility of considering whether or not texts with the same pedagogical purpose, but with different 'content' concerns, share similar interactional structures.

The analysis of texts according to their broad pedagogical purpose is in accord with the social theory of learning on which the study draws. Since every instantiation of scaffolding is a highly contextualised phenomenon which takes place in a specific social setting with particular participants and for particular task-related purposes, any attempt to 'group' instances according to a taxonomy which does not take account of context and purpose would seem to be at odds with the very nature of scaffolding. Webster et al (1996) suggest a similar mapping for theorising scaffolding through what they term the 'components' of scaffolding. In their scheme, the first component is *recruitment and management*, which refers to the initial

orienting of the children to the task, for example the way that the teacher gets the children to focus on the task, either by calling them to attention or by "warming and inspiring" them to its relevance. The second aspect of scaffolding is *representation and clarification*, when the teacher represents the task in terms the children can understand, for example, discussing with children what they already know of the topic, what they predict will happen in the course of the enquiry, or modelling how they might tackle a problem. The third component is *elaboration*, when the adult helps children to develop or adapt their concepts, and also includes considering alternative ways of proceeding through the task. The fourth is *mediation*, which they define as using literacy to work through a learning process. The final component is *finishing*, which involves drawing together children's classroom activity and reflecting on its process and worth. Barnes (1976) presents a similar four stage learning sequence: a focusing stage, an exploratory stage, a reorganising stage and a public stage. Reid at al (1989), adapting this, suggest a five stage model of learning, namely engagement, exploration, transformation, presentation and reflection.

At the end of the chapter, some conclusions are suggested relating to the significance of particular patterns of interactional structures at each of the four stages, and about the socio-cultural nature of the jointly constructed discourse.

It should be noted that the linear nature of the organisation of the chapter should not be read as implying that scaffolding is itself a linear process. On the contrary it is by nature recursive and reflexive, with teachers continually revisiting the nature of the task, the concepts being developed, and the processes being followed. For example, the teacher may remind children of task instructions at times other than the stage: *Setting up the new task*: the giving of instructions are discussed however at this stage since this was where it most frequently occurred. It must also be noted that the examples and discussion represent what is illustrated by this data set, (although it seems likely that similar interactions occur in other classrooms: see for example, work by Webster et al 1996; Edwards and Mercer 1987, Mercer 1995, Graddol, Maybin, and Stierer 1994, where similar examples of teacher talk occur).

As in previous chapters, the texts are accompanied by a reference to the classroom and the episode number, which can be cross-referenced to the episode summaries in Appendix 1, and are numbered in relation to the order in which they occur in the chapter. There is also a brief quote from each text as a title: this is intended to encapsulate, as far as possible, the pedagogical purpose of the discourse and to give the reader a sense of what the text contains. As in the previous chapter, prior to each text is a short description of the context in which it occurred to provide for

a more contextualised reading, and following each text are discussion comments. In order to show the cumulative effects of scaffolding, it has been necessary to include a few quite lengthy texts.

PART 1: THE TEXTS: INSTANCES OF MEDIATION

Stage 1: review and orientation

The review of research on second language development (Chapter 2) pointed to the need for new learning to be located in students' prior experiences. Wong-Fillmore points out:

> By putting the present lesson in the context of previous ones, teachers anchor the new language in things that they have reason to believe the students already know. If students remember what they did or learned on the earlier occasion, the prior experience becomes a context for interpreting the new experience . . . prior experiences serve as the contexts within which the language being used is to be understood.
> (Wong-Fillmore 1985, p. 31)

Forrestal makes a similar point about what he calls the 'engagement' stage, suggesting:

> For the pupils to become engaged in an activity, they need to understand how a particular lesson, or unit of work, fits in with what they have done before and what they will study in the future.
> (Forrestal 1992, p. 159)

The mediating role of the teacher at the orientation stage is largely concerned with providing this anchor for new learning. At the beginning of the topic the teacher may elicit from students what they already know, as a common basis for beginning the unit. Thus her mediation can be considered as providing a bridge between students' current knowledge as developed outside this particular classroom context, and the subsequent new learning. This occurs, for example, in both classrooms in the first episode of the topic. Once the topic has begun, and particularly at the beginning of each lesson, the teacher mediates between the students classroom experiences of the topic to date and the learning objectives of the next task, eliciting from them what

they have learned so far, or what they did in the last lesson. This also offers learners a second chance to hear a summary of the conclusions the class has come to thus far. These texts often have a 'Janus' quality, both reflecting on what is past and pointing the way to what is to come: they are signalled in the episode summaries by the phrase *recap and set up*, for example see 2:10, 15, 21, 27, 29, 32, 36, where in every case they occur at the beginning of a new lesson. The illustrative texts included here relate to the 'recap' aspect of the *review and orientation* stage, and show how the teacher, through her scaffolding, reminds children of what they have done and what they have learned, thus providing a shared basis of understanding for what will happen next, and a bridge to subsequent talk and learning. In this way, new learning and new language are located within current understandings.

Text 6.1
Classroom 2: Episode 21
Try and get a picture in your mind of what we did on Monday.

Context

Very typically, both teachers began each lesson in similar ways, illustrated by this text. In the previous lesson three days previously, the children had worked in groups following sets of written instructions to carry out experiments demonstrating magnetic attraction and repulsion.

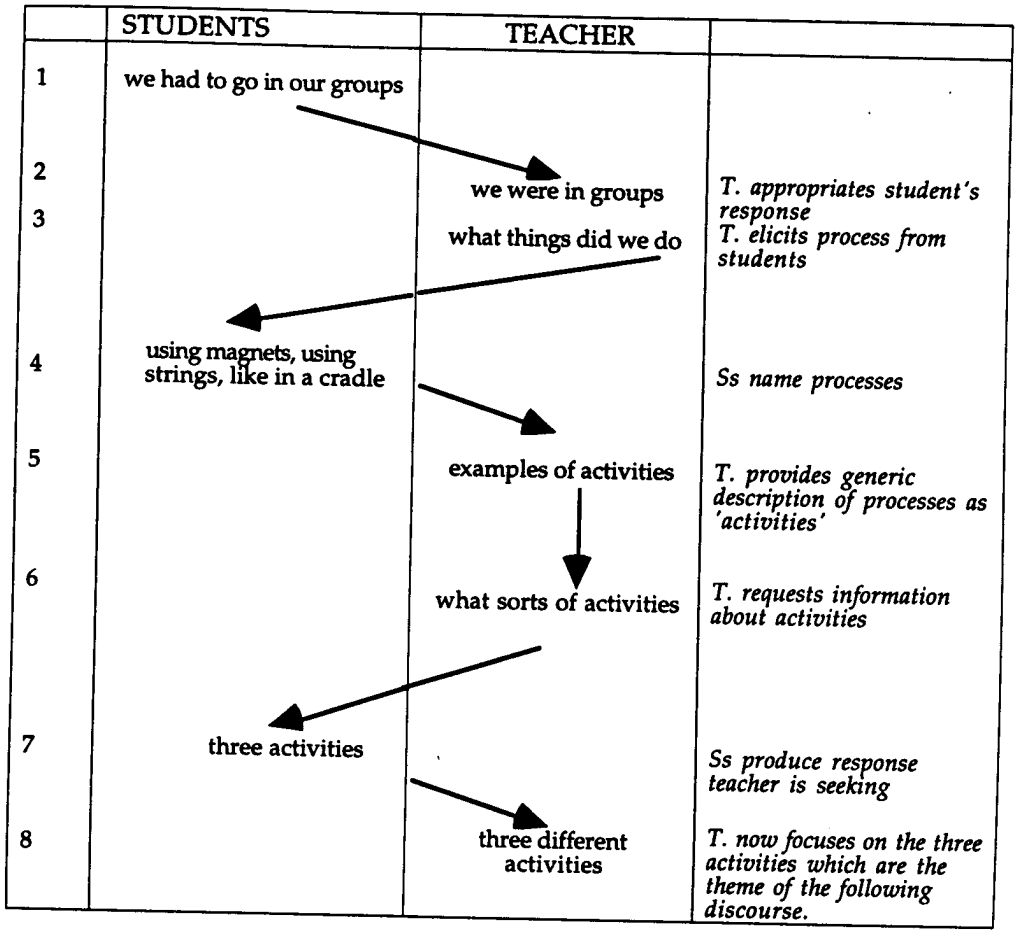
	STUDENTS	TEACHER
1	yes	today/ well first of all let's . . connect ourselves back to 'last lesson/was everybody here on Monday . . . I think we were all here on Monday . . what did we do. on Monday? Marcel's thinking so's Andre/ just think/try and get a picture in your mind. of what we did last Monday. Maroun? Maroun
2	M: Miss we had to go in our groups and everyone had. some people had. em things to do and we had to read each. instr . . . =	
3	S1: instruction	
4	M: = instruction	
5		OK so we were in groups/ what things did we have to do/who can help Maroun explain that? Bernadette?
6	B: like we get . like people doing the groups like using magnets? . . in each group like using strings and the em . . cr . . . em the magnets . like in the cradle?	

7		mmm . so you're giving me some examples of the activities . . . what sorts of activities were they Diana?
8	D: em like there were three activities/ we were in our groups . . and like we had to follow the instructions.	
9		excellent/ that's exactly right . there were three different experiments or three different activities . each group had one of the activities we had two groups working on each activity and there were instructions that you had to do . . to use the magnets . . what I'm going to ask you to do now instead of . telling me what happened straight away/ I'm going to ask you to go back . into those groups . . OK for a minute or two . . and I want you in your group. to. retell or recount what you 'did

Discussion

The scaffolding here serves to create a shared understanding of what the last lesson consisted of, which is then used as a basis for the next task. The use of 'we' serves to locate the teacher as part of this shared understanding, and represents what Edwards and Mercer (1987) describe as a 'joint knowledge marker', marking the knowledge as significant. Meanings are initiated by students and appropriated by the teacher, creating dialogic rather than IRF-type patterns (as defined in Chapter 4). Throughout the discussion, the teacher appropriates part of each student's answer within the following question, which in turn pushes the dialogue towards what the teacher wishes to mark as significant. Figure 6.1 represents how the appropriation by the teacher is realised through the lexical links across successive turns, and how from the students' initial answer (1) she leads students back 'on track' to focus on what she wishes to talk about. It is also an example of what it might mean, in discourse terms, to 'lead from behind'.

Fig 6.1 Leading from behind: appropriating responses



The teacher begins by inviting the children to "connect [themselves] back" (1) to the previous lesson, encouraging them not to answer immediately but to first "get a picture in your mind" of what happened. She appropriates part of Maroun's answer (*we had to go in our group*) in her next question (*what things did we do in our groups?*). Bernadette begins to describe some specific experiments, which the teacher summarises as *giving . . . examples of the activities* (7). She locates this recontextualisation within her next question: *what sorts of activities were they?* (7). Diana summarises the work of the class as a whole and the teacher responds by giving her own summary of the work the children were involved in. Having focused the children, briefly but very explicitly, on the events of the last lesson, she links the now shared understanding of what they did to the instruction for the new task, which is to return to the groups and *retell or recount what you did* (9).

Thus the discourse serves to build up common understandings about what has already occurred and then to use this shared agenda as an anchor for what is to come next.

Text 6.2
Classroom 2: Episode 27
Can you tell me anything that we have learned about magnets so far?

Context

This text occurred at the beginning of the fifth lesson, after the children had taken part and reported on a number of experiments and had begun to produce generalisations about the kinds of things they were finding out. Prior to setting up the next activity the teacher gave the children an opportunity to recap the shared knowledge of the class.

	STUDENTS	TEACHER
1		can you tell me . . anything . . anything at all. . think about it in your mind first/ take some thinking time . . . anything that we have learned about magnets so far . . . just have some thinking time . . . anything that you have learned about . magnets so far . . . . . think . . . . OK Janet
2	J: Miss. the north pole and the south pole attract to each other	
3		OK . . there are two parts of the magnet the north pole and the south pole . . which parts attract to each other?
4	J: Miss the north and the south	
5		OK so we learned last week didn't we/ that opposite. poles attract/ good/ Andre
6	A: most north and * em (don't) attract to each other =	
7		well done
8	A: = and	
9		sorry keep going
10	A: and all magnets are strong . like.	
11		that the same poles/ north and north and south and south they don't attract to each other/ they . . . ?
12	S2: separate	
13	S3: repel (*several voices*)	
14	M: push	
15		repel/ well done OK . . Charbel
16	C: all metal twisties are magnet (*sic: magnetic?*)	
17		all?
18	metal twisties	
19		we did know that didn't we . through the tests/ good

20	J: magnets can attach to other magnets strongly	
21		OK good/ magnets can attract to other magnets . Fabiola
22	F: that not all metals . attract to em magnets	
23		yes that was like/ I think/ what Charbel said . . before when we started we thought that . we just said metals . attract. to magnets. now we know that it's not 'all metals just 'some metals . . . . OK . . . you're learning well and you're remembering a lot which is really good too. can you listen really carefully now I'm going to explain . . we're going to do . two experiments today and two . on . Wednesday.

Discussion

Again this text serves to make explicit what is to be taken as shared knowledge. The teacher initially speaks slowly with quite considerable pausing, and a suggestion that the children think about what they have done *in your mind first* repeating that they should take some *thinking time*. This encouragement to reflect before trying to answer is a strategy often used by this teacher (see, for example, the previous text). Given that an increase in wait time has been shown to result in increases in the quality and length of student answers (Swift, Gooding and Swift, 1988) and to lead to more self correcting behaviour from second language learners (Krashen and Pon 1975, cited in John-Steiner 1975), we can surmise that this 'enforced' wait time might have similar results.

Janet's response (2) is an appropriate one but the teacher nevertheless probes what Janet has said and contextualises the statement by adding a further generalisation: *there are two parts to a magnet* (3) and asking Janet to tell her again which parts attract. Again we see the message redundancy that often typifies these interactions, which appears to be less for the benefit of the interactant than it has to do with the teacher's agenda to make sure everyone listening understands and shares in the group's common knowledge. This item of information is then marked as a piece of significant learning: *we learned that last week didn't we* (5). The use of the tag suggests that this is now knowledge which the students and teacher all share, (the subtext perhaps being that if it is not, it should be). She also offers a further recontextualisation of Janet's original contribution by replacing *north* and *south* by *opposite poles*, thus shifting it closer to a scientific explanation (5).

Andre's contribution is not clear, but the teacher appropriates it to fit with the theme of the discourse, recontextualising it as *the same poles/ north and north and south and south/ they don't attract* (11). This is certainly not what Andre actually said — the recontextualisation here is some distance from Andre's meaning and suggests perhaps that in this piece of discourse the teacher's agenda, (to summarise the class' learning to date), is very explicitly driving specific kinds of meanings to be constructed. She continues this turn with a cued elicitation: *they . . . ?* There are three responses (12, 13, 14), and given the purpose of this piece of discourse it is not surprising that the teacher repeats the most registrally appropriate and ignores the other two. Charbel's contribution (16) is similarly made to fit the line of thinking the teacher is building up. The teacher's immediate response is to agree (19) but she does not recontextualise what Charbel said and the suggestion seems to be left hanging. In turn 23 however it is incorporated into the thematic development of the discourse by being linked with another contribution: *that was like . . . what Charbel said.* The contribution — *that not all metals attract to magnets* (22) — is again marked out by the teacher as significant, and as something the class has learned since starting the unit: *before we started we thought that . . . now we know that . . .* (23). In her final turn the teacher marks the worth of what the children have said — *you're learning well and you're remembering a lot* (23) — before she sets up for the new episode.

Edwards and Mercer (1987) describe such texts, where the teacher highlights events or learning as of significance, as 'reconstructive recaps', and suggest somewhat cynically that in these contexts teachers often 'rewrite history' by highlighting events and understandings that they see as educationally significant, while playing down events which they see as less relevant or confusing. We can question, for example, how far turns 6, 11 and 23 *do* reflect what Andre and Charbel attempted to say. This is an issue which is taken up later in the conclusions to this chapter. Certainly however, the benefit of such 'highlighting' to children learning in their second language would appear to be significant.

Text 6.3
Classroom 1, Episode 8
We said what we did . . . now I want some general ideas

Context

The teacher has just built up with the children a list of things that the magnet attracted or did not attract, based on their observations of the previous day. As the children had given suggestions, the teacher had scribed them on the board under the headings: *the magnet attracted . . . / didn't attract . . . .* (see Figure 6.2).

Fig 6.2 Teacher-scribed responses from students

the magnet attracted	the magnet didn't attract
the nail other magnets the paper clip the lid the safety pin	the gold screw the cork the five cent coin aluminium foil the bottle top the two cent coin

The teacher had drawn the children's attention to the fact that this had occurred 'yesterday', thus underlining the need for a past tense to be used. When text 6.3 occurs, the list is still on the board. The teacher's objective for the next activity is to get students to begin to generalise about magnets, based on their observations and their talk about what they had done on the previous day:

	TEACHER
1	good now/ I'd like for you/ we're going to go back into your same
2	groups . and you're going to answer some questions . that/ like that
3	Amanda was asking/ why is it . that the magnet didn't attract the
4	screw/ it's metal/why didn't it attract aluminium/ that's metal/ but
5	it 'did attract . the plastic coated safety pin and it 'did attract . the
6	safety pin/ these (*showing coins*) are metal/ it didn't attract the
7	coins/ I'd like for you to come up with some ideas about that/ in
8	your groups/ Colin I'd like for you/I'm going to keep this on the
9	board/ I'd like for you to give me . some 'general ideas about
10	magnets/ some general ideas about magnets . .'this (*indicating the list*
11	*on the blackboard*) we said what we 'did/ what we 'saw/ now I want
12	some general ideas/ I'll give you one . . 'magnets 'sometimes at'tract
13	'other 'magnets/ do they always?

Discussion

Again this text is marked by explicitness and message redundancy. The teacher leads up to the instruction in line 11 in a number of steps, which involve reminding the children of what they have found out so far, by foregrounding the question which one of them had asked earlier in the lesson: *how come the nail* (*sic*: actually a gold coloured screw) *didn't stick to the magnet?* Part of effective scaffolding appears to rest on the alertness of teachers to the ways in which a student's questions and ideas can be appropriated and built on. In order to model to students the sort of things she wants them to think about in answering this question, she summarises and recaps their own ideas, their previous learning, and recontextualises them in a way that highlights the apparent anomaly in what they have found (3 - 6) thereby pointing the way forward to the question they are going to consider.

The message redundancy is created by the syntactic and semantic symmetry which is represented below. This symmetry is achieved through the use of two interrogatives (1 and 2); followed by two declaratives (4 and 5), the two mood types textually linked by *but* (3). The sequence ends (6) with a reversal of the polarity of the previous pair, and repeats the propositional content of 1 and 2. The question at this point however is left implicit.

1. why didn't the magnet attract X/ it's metal
2. why didn't it attract Y / that's metal
3. BUT
4. it 'did attract . . .
5. it 'did attract . . .
6. Z is metal/ it 'didn't attract Z

Pedagogically this repetition, and thus message redundancy, appears to be very effective as teacher talk: it highlights again what the teacher considers to be significant in what the students have found, it serves to remind children of how they should be thinking in the task she is about to set up, and it summarises for students the common knowledge of the class to date. As in the previous two texts illustrating this stage, teacher talk serves to provide a link between previous learning and the new task.

Stage 2: setting up for the new task

At this stage, the teacher mediates between the demands of the task and the children's current ability to do the task alone, by scaffolding how the task is to be done. At several points in this thesis, reference has been made to the notion of explicitness in relation to minority learners (see for example, discussion of Delpit, and Wong-Fillmore, Chapter 2). The illustrative texts from this stage indicate what it is that teachers consider to be important to enable students to complete the tasks, and how they make this explicit.

Texts 6.4 - 6.6 show how the teacher scaffolds the task for students through the instructions she gives. Remembering a sequence of instructions may be a particularly difficult task for second language learners, and the scaffolds teachers use here support students in understanding the requirements of the task. In text 6.4 students are asked to retell instructions, offering them a second chance to understand what they are expected to do. In text 6.5, following some misunderstandings from some children, the teacher redefines the nature of the task. In text 6.6 she demonstrates

the task herself, and thus introduces an additional semiotic component to the interaction. This set of texts is glossed as *Scaffolding instructions.*

In setting up the task, the teachers' scaffolding is not restricted to talk about the task per se. As Chapter 4 pointed out, talk about language and the construction of student identity are sometimes foregrounded in the discourse, particularly when students are about to begin a new task. As a number of texts show, the discourse includes a focus on the language and on the interpersonal skills that are integral to the successful completion of the task. Texts 6.7 and 6.8 show how the teacher focuses on the language that was integral to the task. Text 6.9 shows how the students are asked to reflect on the characteristics of collaborative group work, a significant aspect of the setting-up of the task, given that most of the experimental tasks took place in small groups. These texts are glossed as *Scaffolding how to talk and how to be.*

What all the examples of teacher scaffolding in this section have in common, the pedagogical function they share, is a deliberate attempt by the teacher to set up and scaffold tasks in such a way as to make clear to learners the boundaries of the task, the processes by which it will be carried out, and the expectations of the teacher.

Scaffolding instructions

Text 6.4
Classroom 1: Episode 5
Would you tell me what we're going to do?

Context

In this text the teacher gives instructions to the children about a task they are about to do, and then asks for the instructions to be retold. The task itself involves using a range of magnetic and non-magnetic objects and a bar magnet. The terms 'magnetic' and 'non-magnetic' have not been used by the teacher at this point. Though no specific instructions are given as to how they should use the equipment, the children are told that they are to record and later report on anything they find out.

	STUDENTS	TEACHER
1		now . what we're going to do . . is . I have six groups of things up here . and we're going to get into groups . and you're going to get . . . Stacy/ we're going to get into groups and you may have . there are two different types of magnets here/ you may take one . of each . and they/you have quite a few different materials here and I want you just /I'm not even going to tell you what to do with them . . I want you to do with it . . as you like . . . . but I want you to try to find 'out something from all of this . . so you need to record this in some way/ you need to choose a recorder so that your group records what you find . . so that you have something to report back to us/ now tomorrow afternoon we're going to 'tell each 'other what we found in our groups . so today we're just going to spend time . in your groups . . working with the magnets and working with these material but I want . some kind of recording . yes Francis what?
2	F: could you pick the groups?	
3	(*no response from Viv*)	I'm going to pick the groups yes . alright would you tell me Vivien what we're going to do? . . . come on Viv . said it twice . . . Moya will you help Viv?
4	M: we are going to get . . one . of two kind of magnets . and . and . we are going to go to . one of the group . on the blackboard . . shelf and and . . do what we like with the magnet?	
5		yes but there's something very/ something else that's very important . what else 'must you do? Philip? What else 'must you do/ you can't just . do whatever you / you 'can do whatever you like but you also 'have to do something/ Belinda?
6	B: you have to record what you did	
7		you have to re'cord . . what you found . and what are we going to do tomorrow Philip?
8	P: em we're going to/ we're going to going to	
9		what are we going to do tomorrow?

10	P: we're going to tell . what we found out	
11		good boy/ you were listening/ that's good Philip . . you're going to tell what you found out . . not all groups will record things the same way and they may found/ may find different things

Discussion

After the teacher has given the initial instructions she asks one of the children to retell what they have to do. The first student asked was unable to do this (the field notes suggest she appeared not to be listening), and the teacher then asks Moya to 'help' her. Moya is able to retell most of the instructions, but leaves out the final step of recording (4), which from the teacher's perspective is a major part of the task, given that the children will report their findings the next day — note that *record*, in various syntactic forms, occurs four times in her initial instruction. The teacher repeats the phrase *what else 'must you do* (5) twice , underlining the degree of obligation through marked stress on *must* . The teacher again draws the students' attention to how the task will fit with what will happen the following day (7 - 10). Each of the three student contributions (4, 6, 10) is in response to a series of questions from the teacher: *what are we going to do? what else are we going to do? what are we going to do tomorrow?* which scaffold for the students the key stages of the task: to find something out, to record it and to report on it. The scaffolding results in the students naming the processes in which they will be participants. This offers additional opportunities for children to hear the instruction and understand what they have to do, and for the teacher to make explicit, in this case through the nature of her questions, what she considers to be the major focuses of the task.

The retelling of instructions occurs regularly throughout the data (for example, 1: 5; 1:13; 1: 21; 2:4; 2:11; 2:15(iv); 2:21; 2:23(iii); 2:34). It appears to be a particularly relevant strategy for second language learners, who then have an additional opportunity to understand what it is they have to do.

Text 6.5
Classroom 2: Episode 36
Just so we're clear on what we're doing

Context

In the previous lesson the children had started to write generalisations based on the results of all experiments throughout the five weeks of work. They had used a process whereby individual students shared ideas with a partner, then with another pair, in order to produce a set of generalisations which they all agreed on. These

were later to be written on large sheets of card as a way of recording the work done. When this text occurred the children were just about to start scribing onto the card, but since the teacher noticed that some children had begun to interpret the task as recounting what they had done, rather than making generalisations about the results, she 'revisits' the concept of generalisation. This suggests the non-linear nature of scaffolding, and the way in which it is responsive to and thus contingent on moment-by-moment teaching needs. Here that includes redefining task specific requirements.

	STUDENTS	TEACHER
1		OK when I took your work and had a look at it . . I could see . very very clearly . the sorts of things that you found out from the experiment . the sorts of things that you could . 'generalise about . . just so we're clear on what we're doing . what is it that we are 'writing when we 'write a 'generalisation . . OK so we're 'making generalisations or we're 'writing generalisations . . what are we writing about . . . . . Milad?
2	M: magnets?	
3		OK we're writing/ we 'could be writing about magnets and at the moment we 'are writing about magnets/ you're right . think about that alright we're writing generalisations about magnets . . what are we talking about Emily?
4	E: we're talking about the results that we got from the experiments and what we've learned overall	
5		that's exactly right/ what we've learned overall/ we're trying to draw conclusions about what we've learned . now Milad we're we're talking about magnets . as a scientist . . . good to see that you're listening and that you're with me . as a scientist can I . do an experiment with 'every 'magnet in the world?
6	M: no	
7	no no (*several voices*)	
8		I would be spending/ I would spend my whole life doing it and I'd 'still . wouldn't be able to do it would I . so when I write a generalisation . . what am I actually trying to say . . . . Emily

9	E: em you're trying to use the information from the experiments to talk em try and make it about 'all magnets	
10		that's exactly right . I 'haven't 'done it with all magnets/ I could not 'possibly even if I were the best scientist in the world . I couldn't do my experiment . with all magnets . but what I'm trying to do . is apply what I have learned to all magnets

Discussion

Although the teacher feels the need to redefine the task, she begins by affirming the validity of the work the children had done (1)*I could see very very clearly the sorts of things that you found out from the experiment, the sorts of things that you could generalise about,* thereby legitimising its relevance, creating a common starting point for redefining the task and, in Vygotskian terms, using the current achievements of the children — their progress to date — as a way of focusing on the future task. The purpose of the interaction is made explicit to the children: *just so we're clear on what we're doing . what is it that we are 'writing when we 'write a 'generalisation?* Milad's response (2) to this question is not rejected but incorporated into the following turn (3) and again later in the discourse (5). Emily's response (4) is much closer to the point that the teacher wishes to make, and the teacher appropriates and echoes part of her response: *what we've learned overall.* The teacher however replaces Emily's *'results'* with her own *'conclusions'*, perhaps to focus the children's attention away from their individual results towards the general conclusions she wishes them to reach. Thus typically, as a teacher scaffolds, a student response is appropriated, but restated and reworked into the teacher's frame of thinking, before being reinserted into the discourse.

The teacher responds to Milad's possible lack of understanding by further concretising the task, through the scenario of imagining she were the scientist [2]. Linguistically this incorporates both a tenor and a mode shift. It provides a scaffold for Mario in particular, but, as is common in all classrooms, because it is a 'public' interaction, it also provides a support for those within the wider audience who may need it.

[2] In order to get the idea of a generalisation across to the students, the teacher here actually distorts the scientific process. The idea of 'the best scientist in the world' attempting to prove facts about magnetism by experimenting with all magnets is of course contrary to scientific method.

Text 6.6
Classroom 2: Episode 27
I'll just do this one as an example

Context

Here the teacher is demonstrating to the children how they should record the results of a number of related experiments onto a bar graph. The aim of all the experiments is to find out whether there are differences in strength between the north and south poles of a magnet, and between different types of magnets. The experiment that the teacher is using in her demonstration requires the children to dip each pole of a bar magnet into a jar of paper clips and then count the number of clips attracted. There is also a set of written instructions for each group of children. The two axes of the graph are already written up on the board, but they are not yet labelled.

	STUDENTS	TEACHER
1		so this is the first one. when you do a graph you know . that you always have the two axes/ OK this one which is the . vertical . and this one is the . ?
2	horizontal (*several voices*)	
4		horizontal good and it will actually tell you on the card what you are to call each axis/ OK so it's 'fairly structured . this side . you'll write the number . . . what do you think you'll do the number of?
5	clips(*several*)	
6		clips that's right (*labels 'vertical axis' 'number of clip'*) . . . and you can decide . . how you would like . once you've done your experiment you'll probably know how to go up . you might want to go up in . .
7	fives	
8		maybe two's . .
9	four six	(*writes 2. 4. 6. on the vertical axis*)
10		OK but you will have a better idea once you've done the experiment/ I'll just do this one as an example. if you've got the number of clips. up here (*points to vertical axis*). down here (*points to horizontal axis*) we need to know. the type of magnet (*labels horizontal axis 'type of magnet'*). . OK because you all . . . and you know that there are three different sorts of magnets so the first one that I asked you to use was the . ?
11	bar magnet (*all*)	

12		OK (*writes 'bar magnet' on horizontal axis*) so . . . you can use . . this to do me a bar graph . OK so that you'll know here (*pointing to horizontal axis, next to 'bar magnet'*) . . it might be a fridge magnet . which magnet you were using . .
13	bar magnet	
14		and how many paper clips were attracted to it
15	Miss can we go by one two three four five?	
16		yes you will know. how to go better when you/ when you know the clips so if you're using the bar magnet/ what was the first thing I asked you to do/ use . you had to choose . a . ? you've got the bar magnet and you had to choose a . ?
17	pole	
18		a pole . . that's going to make a difference to your graph as well . so. if I'm using the bar magnet . . and I decide to start with my north pole . . I need to say that on my graph . . OK so I'd say bar (*pointing to 'bar'*) and what could I put there to help me say . ?
19	a little 'n'	
20		a little 'n' good (*writing 'n' beside 'bar'*) . and I would say/ let's . pick a number out of the air . . . six? I got six clips attached . so I would go . I'd/ you'd use a ruler of course I'm not doing it because I'm trying to be quick . . when I use my bar magnet and I use north I get six (*counting up the vertical axis and marking on graph*) . . . .
21	aah (*showing understanding*)	
22		OK then when I use
23	see what the strongest is	
24		a bar . . . oh you're quick Maroun

Discussion

This series of exchanges is characterised by the very unequal amount of teacher and student contributions, with the teacher relying largely on 'cued elicitation', that is, the provision of strong clues to students about the desired response in order to obtain specific responses from the children. (Cued elicitation is discussed further later in this chapter). Although the use of cued elicitation results in minimal responses, these responses are significant in that the students are being required to name the lexical items which will eventually appear on the graph, for example *clips*

(5); *four six* (9); *bar magnet* (13); *a little 'n'* (19). One of the differences between cued elicitation and other interactional patterns appears to be that children are often not called on to answer by name nor are their responses overtly evaluated. The evaluation is inherent in the fact that the teacher usually repeats the response item and continues the discourse, here incorporating the contribution into the board work. This produces discourse which tends to feel more 'fast moving' than other patterns of discourse because it is not punctuated by anything extringent to the particular thematic development.

In the context in which this text occurs, meanings are built up via the discourse, the written instructions and the graph on the board. As Chapter 5 discussed, these multi-modal sources of meaning help make the written instructions comprehensible. However the graph on the board is not simply a device for demonstrating to children how they should read the instructions. It also constitutes an additional text, a way of mathematically representing the information the children are about to obtain, and as such, a text type which students must learn to 'read' as they would a linguistic text. Hence perhaps the teacher's explicit demonstration of how to label the diagram and then how to record the information.

Later in this stretch of discourse (not included here), the teacher made explicit the fact that a graph is an information source: *it must tell you something . . . . there must be some information that you can get from the way that you recorded* , while later in the discourse she referred to the graph as "an efficient way of organising information". She also drew the children's attention to the purpose of the activity, pointing out that later they will need to compare our results. She then demonstrated the second experiment, this time using pins rather than clips, but did so much more briefly, again cueing the responses she wanted. This time, as the excerpt below shows, the instances of overlapping speech and increased participation by more children suggest that the task is better understood:

STUDENTS	TEACHER
horizontal (*many*)	then . once again I would like you to use a graph to record your findings . . . OK because it is . an 'efficient way of organising your information OK so for this graph it's a similar sort of thing . . . . two axes . . Simon right? . . . . . your vertical . . and your horizontal
	what might go. on the vertical axis of this one . . .
number	
	number of what?
paper clips	

	are we using clips this time?
pins pins (*many*)	
	well done . exactly right . the number.
of pins (*several*)	
	of pins . . . . . will go on your vertical axis . . and on your horizontal axis?
em bar	
	thank you for using your hand. Catherine
type of magnet	
what we're using (*several*)	good. once again. the type . . . and. you need to indicate once again if you are using . . . which pole . .

The instructions for the first experiment are thus given very explicitly, with a brief repeat for the second experiment, although the scaffolding is much less on the second occasion. The demonstration and accompanying language provide a scaffold for the children to do the task, which they subsequently carried out with minimal help from the teacher. Even at this stage they are not left without support, since every experiment is accompanied by a set of written instructions, which the teacher reminds them to look at if they forget what they have to do. This frees children from complete dependence on the teacher, while providing a degree of ongoing support for some.

Scaffolding how to talk and how to be

Text 6.7
Classroom 2: Episode 27
How could we make the language of prediction?

Context

The following is taken from the same stretch of discourse as the previous text. The teacher has asked the students to predict the result of the experiments before they are carried out, and is now reminding them of how they can talk about 'predicting'.

	STUDENTS	TEACHER
1		I want you to try and predict the results with your group . . . without touching any equipment /have a think . . . about what 'might happen . what 'may happen and just take some time talking about that . . . Diana might say "I think that . . . the north pole is going attract the most number of clips". because . . how else could we make the language of prediction . what could you say we could use "I think" . what else could you say . . .

2	M: maybe	
3		maybe . the south pole . . will be stronger than?
4	M: the north?	
5		that's something else you could say/ Julianne's going to give us another one/ she's been concentrating so well
6	J: em it could be?	
7		OK it could be that the horseshoe magnet . . . is stronger than . . .? Belinda?
8	B: em. . . . oh . my prediction . .	
9		good . . can you extend that a bit . Janet? my prediction . . .
10	J: em/ is?	
11		good my prediction is . . Robert?
12	R: em . . . em . . . probably the . .	
13		good that's a good start . . probably . . OK Simon . lots of language coming out here . . .
14	S: I predict that . .	
15		excellent . . .
16	E: em . . perhaps	
17		very good/ that's a good one Emma

Discussion

Here the focus is on language, but language as it occurs in the context of actual language use. Occurring as this point, immediately before the group work where the focus language will need to be used, makes it likely that it will be 'noticed' by the students. The teacher had also on other occasions related the notion of predicting to 'thinking like a scientist', pointing out that scientists make predictions, and then test them. It is likely that students are already fairly familiar with this aspect of language, as the teacher had also previously talked about 'the language of prediction' (Classroom 2: 12).

The teacher first models an example of what she calls the *language of prediction* (1) by using a projecting clause to project the model of what students might say: *Diana might say "I think. . ."*. This strategy involves the teacher playing the role of a student and using projection to model the focus language.[3] The projected clause, beginning with *I think*, is also itself a further projection. At the end of this turn, when the teacher asks the students for other examples, there is a further example of the message redundancy which is frequently used to mark a message as significant:

[3] See also text 6.11 for a similar use of projection, and the discussion in the conclusions to this chapter.

how else could we make the language of prediction; what could you say; we could use "I think"/ what else could you say?

The students go beyond the teacher's model and offer several types of realisations of modality: subjective and explicit, like that modelled by the teacher: *I predict that* (14); explicit and objective: *it could be* (6); implicit and objective: *maybe, probably, perhaps* (2; 12; 16); and expressed through a nominalisation: *my prediction* (8)[4]. The teacher extends the first three of these responses(3; 6; 9) to model a complete clause, again providing a more coherent model for some students. Perhaps because of the potential grammatical complexity of *it could be* and *my prediction,* she also uses marked stress to help the students notice the structural form: it *could be* <u>*that*</u> and my *prediction* <u>*is*</u>.

It could be argued that since scaffolding has been defined as help which is given for a task that students would be unable to do alone, the apparent familiarity by the students with what is required might suggest that this is not 'scaffolding' in this strictest sense. Several points can be made here. A teacher's aim in this kind of interaction is to remind students of something they know so that they are better able to complete the task successfully. The aim here is not to 'teach' the use of modality but to help students express modality *in the context of this task.* Thus it becomes part of the larger scaffolding around the setting up of the task. What is also significant here is that the children who respond are the more fluent English speakers, and thus it could be argued that they are being asked to provide a 'scaffold' for their less fluent peers. Teacher-student interactions in the context of whole-class talk, even when only with one student, are also public interactions. Most teachers of course exploit the public nature of the discourse so that what they say to one student is expected to be 'heard' as applying to all. (Indeed when this is not the case, teachers will often mark what is intended only for an individual by saying something like "I'll come over and talk to you later".)

In the group work which followed (2:28) there was evidence of 'uptake' of the focus language by several of the students:

> I predict that the north will stick/ will get more needles (sic) than the south (Duncan)
> I think that the north pole will pick up more pins (Andre)
> probably a hundred will stick (Gabriella)
> no maybe all of them will stick on it (Duncan)

[4] See Halliday 1985 for discussion of the terms used here.

I think that the north pole will stick most of the things (Andre).

Text 6.8
Classroom 2: Episode 21
Your audience doesn't know

Context

This teacher talk occurred after the children had taken part in a range of experiments relating to magnetic attraction and repulsion, and prior to a teacher-guided reporting session. Each group had done a different experiment and thus had different, though related, information from other groups. The teacher is here preparing the children to take part in the reporting.

TEACHER
I'm going to ask certain people to come out the front and tell the rest of us. what you did and what the results were. because we all did different experiments/ we don't know the results/we only know the results of 'one experiment . . so the language that you choose to use is going to be very clear and very precise because people 'don't know what was going on/ because/ remember this morning when I was talking to you about your novels. it's all in your head all that information in your novel/ and your story is in your head . . your audience doesn't know so you've got to unpack that all for them . and it's a bit like this/ people didn't do the activities that you did/ other children didn't do them . so I want you to go through/ carefully describe what you did . and what your results were

Discussion

The teacher is here explicitly drawing students' attention to the fact that their audience does not have prior knowledge of what each group did, and what the results were. There can be no shared assumptions, and as discussed in earlier chapters, this requires a more decontextualised register which makes more demands on children's linguistic resources. The teacher here draws a parallel between this task, and the novels that the children are currently writing: *your story is in your head . . . your audience doesn't know so you've got to unpack that all for them.* The metaphor of 'unpacking' is a fairly sophisticated one, but one which the teacher had used earlier when discussing the novel writing. She points out that "the people didn't do the activities you did" and so they need to describe everything carefully. This text is a conscious attempt by the teacher to help children become aware of the needs of their audience and to build up a meta-linguistic awareness: in linguistic terms, to shift along the mode continuum towards a more written-like register and more explicit discourse, and for the children to understand why this mode shift is necessary. The teacher focuses on this in several other episodes, for example, in the following episode, she joins one group of children and reminds them: *you've*

remembered that your language has to be really precise because the other children have got to try and get a picture in their mind of what you did.

Text 6.9
Classroom 2: Episode 42
You have to do a lot of negotiating

Context

This text occurred towards the end of the unit on magnets. The final task for the children was to design and make a game for younger children which used magnets in some way. The teacher has explained the task, referring to the written instructions that each group has been given, and has asked students to retell what they have to do. (In this lesson the students have only to design the game and list materials they will need.) At this point the teacher talks with the children, before they begin, about the need to negotiate in groups.

	STUDENTS	TEACHER
1		you're going to come up with ' one game OK . so you have to do a lot of negotiating/ because you're all going to have lots of good ideas . but if/ is it going to be/ get into the group/ "I know what we're doing/ me me me/ I've decided"? is that how we work in groups?
2	no (*many*)	
3		what sorts of things can we remember Simon?
4	S: em share your ideas?	
5		good take turns/ share your ideas . because four people's ideas or three people's ideas . have to be . better than one person's ideas don't they/ we have to get a lot more . Fabiola?
6	F: communicate with your group	
7		how do you communicate with your group . . that's very true but how do you do it?
8	F: like instead of . em when you start with your group you don't em shout . and don't . "I know what we should do and this is what we can do" and if someone want to talk it over say "no this is what we're going to do"	

9		OK so it's a lot of . . first of all . turntaking . and quiet group work voices . and maybe sharing your ideas certainly/ "oh an idea I have" or "one idea I have" . or "a suggestion that I have" . put it forward as a suggestion or or an idea/ people will be much more . willing to listen to it . than if you say "this is what we're going to do" so be careful . with the sort of group work language that you use/ well done .
	later in discussion	
10	*J. raises hand*	yes?
11	J: Miss how about if . like . you have four people in your group . one wants to do something and another one want (*sic*) to do something else and they all want to do different things	
12		they've all got different ideas? good/ good question/ does anyone have any suggestions for Julianne . if you got into your group and everyone says "well this is my idea"/ "this is my idea"/ "this is my idea"/ "this is my idea" and no one wants to . . move from their idea
13	Miss (*many bids*)	what could be some strategies? . Duncan
14	D: like . you could put them all together . like . like make them one	
15	F: make up into one game	
16		OK so maybe try and combine the ideas to make up one game/ that could be one thing/ what if they don't go together though . what if the ideas are very . very different . how could you work with it then . Anne?
17	A: em you could em find a piece of paper and write it and scrunch up and put it into a hat	
18		OK choose it/ maybe say "alright we can't decide . so that the most fair way to do it or the fairest way to do it" . that could be one way . that's another suggestion /Janet
19	J: Miss em we could come up with a different one . em everyone . when they all want to do it	
20		Charbel
21	C: do an arm wrestle?	
22	*laughter*	oh probably not the most appropriate way/ certainly an idea (*laughing*)

23	Miss *laughter*	yes 'scissors paper stone/ arm wrestle/ that sort of thing/ we might get ourselves into real trouble though . . thank you I don't think Mr W and Miss M would be too impressed if they walked in and saw us arm wrestling over what we decide to do . they probably wouldn't think that was . appropriate group work behaviour . . Robert
24	R: Miss em if you can't think of one you can em em you can you can . . play it? and see which one's a good one	
25		OK so you could come up with a few to choose from/ Andre?
26	A: oh Miss like . . you're going to vote for which one is the most fun	
27		that's a good idea . maybe you could say you can't vote for your own but you can vote for one of the others . sometimes though it's just . . not being stubborn . . you know thinking . 'really trying to step back and think "well it doesn't matter whose idea it is . . but what would be the best idea for the task that we're trying to complete"

Discussion

The mediation of the teacher here serves to socialise students into the school's culturally accepted ways of taking part in collaborative learning, which it may be assumed are less familiar to some students. Again as a general strategy the teacher encourages the students to initiate meanings which she then appropriates and expands on. The talk is thus largely about talk itself.

Students are not automatically able to work well in groups (see, for example, Reid et al 1989), and, given that much pedagogy, including second language teaching, encourages the use of group work, then it would seem important that teachers take time to talk with students about the interpersonal skills integral to successful group work. Edwards and Mercer (1987) point out that the educational value of any kind of activities, including collaborative problem solving, will depend on the extent to which students are able to understand the ground rules and relate them to their own experience and ways of learning, and on how well the teacher has set up the environment for generating and supporting talk. The scaffolding here is directly related to the setting up of such an environment, and is an example of explicit teaching about culturally valued ways of learning.

The teacher begins the interaction by taking on the role of a student and modelling an imagined verbal projection, (a strategy also employed in text 6. 7). As discussed earlier, the rhetorical strategy of quoting rather than reporting a projected clause makes the discourse more immediate. This time however the teacher models what she does not want children to say, thereby perhaps making reference, as a starting point for the discourse, to a situation with which children have had some personal experience. She thus sets up a hypothetical situation in which appropriate and inappropriate language can be reflected on.

Each of the students' contributions is appropriated and expanded in some way by the teacher. Simon's suggestion (4) is expanded by causal enhancement (Halliday 1985b): the teacher provides the reason why people's ideas are shared (5): *because four people's ideas . . . . have to be better than one person's ideas.* Her response to Fabiola's suggestion (6) is to invite her to elaborate and she asks for clarification (7). Fabiola exemplifies, as the teacher had done earlier, by giving examples of what not to do through hypothetical direct speech. The teacher responds (9) by taking each 'quote' and showing its antithesis in terms of appropriate behaviour. Figure 6.4 shows how she makes use of the student contributions to make explicit the group work behaviour she is seeking.

Fig 6.3 How do you communicate with your group?

Student suggestion	Recontextualisation by teacher
don't shout	quiet group voices
if someone want to talk it over say "no this is what we're going to do"	turn-taking sharing ideas . . . put it forward as a suggestion
"I know what we should do"/ "this is what we're going to do"	"an idea I have"/"one idea I have"/ "a suggestion I have"

Julianne's question (11) concerns what they should do if they are unable to agree on an idea. The teacher responds to this as a *good question* and again exemplifies the situation that Julianne is referring to through hypothetical projection (12). Julianne's question is appropriated by the teacher and leads to a discussion about possible solutions. Each contribution is responded to in the light of this question, and most are marked by the acknowledgement that it is a possible solution: *that could be one thing* (16); *that could be one way* (18). This marking of contributions as relevant to the ongoing discussion is one way that a teacher maintains a common thread in a discussion and reminds students that contributions should be linked to it.

Fabiola's suggestion (15) is also elaborated by the teacher through clarification, the addition of *combine the ideas to make up one game.* Anne's contribution is likewise elaborated, this time by the teacher again 'quoting' from a hypothetical scenario. Janet's suggestion is not responded to by the teacher and possibly was not heard since there appears to be no reason why it would have been ignored. Charbel's contribution is presented, and responded to, as a joke, but this too is similarly clarified, with the additional comment that the principal and deputy principal would not think this was appropriate group behaviour. Robert's suggestion is elaborated briefly, but Andre's suggestion (26) that the group should vote for the best game is extended by the teacher who suggests a process for the voting: *you can't vote for your own* (27).

At this point the teacher presents her own view, suggesting that it is important not to be stubborn and drawing the children's attention to the need to think in terms of which idea is the best for the task, rather than whose idea it is. Implicitly she suggests that the focus should be on the idea rather than the person — a difficult notion even for some adults! Again this rather difficult and abstract message is concretised by the act of quoting; quoting here evokes a potentially real event, an effect enhanced by the orientation of the deixis (Halliday 1985b): *well it doesn't matter whose idea it is . . but what would be the best idea for the task that we're trying to complete?*(27).

This text shows how the teacher helps the children develop the difficult concept of 'negotiation' by appropriating each of their suggestions and elaborating, enhancing, and extending them to make explicit in the discourse her own beliefs about some key characteristics of effective group work. Suggestions about such characteristics are likely by their nature to be somewhat abstract, but the teacher constantly grounds them by modelling their realisations through hypothetical quotation, a strategy which the children too make use of. For children less familiar with the culture of the school, the explicitness by which cultural expectations are presented is especially significant.

Stage 3: doing the task

Since at this stage students worked in groups, the overt role of the teacher diminished and there was comparatively little teacher scaffolding except when she joined a group. It should be noted that in general there appeared to be little overt need for her presence, and this was perhaps largely the result of the nature of the

scaffolding provided through the *Setting Up* stage. When she joined the groups, she took on a mentoring role, checking on whether students were 'on task', and whether there were any procedural problems. Often she would elicit from children what they had discovered or done so far, thus helping them to articulate their learning, and see what they had achieved and how it fitted into the requirements of the task. The students were not however without help when the teacher was not with them. Written instructions often accompanied the task and the children were frequently reminded to consult them if problems arose.

In addition, help with the task was often provided by other children, even when there was no one student who was clearly more knowledgable than the others. Student-student talk is important for different reasons than teacher-student talk; it provides a context for "the skills of disputation, the notion that all knowledge is questionable" (Edwards 1990, p. 66) which is less possible within the asymmetrical interactions between teacher and student. Since this chapter is specifically on the role of the teacher, these issues will be discussed in the following chapter which focuses on the learners. Perhaps the most important role the teacher appeared to play at this stage, apart from clarifying the task with individual students, lies in the planning and organisation of the materials themselves. These materials are the tools through which learning at this stage is mediated.

Text 6.10
Classroom 2: Episode 28
Are you people on track?

Context

Here one group of children are carrying out an experiment designed to explore the comparative strengths of each pole of a magnet. This required them to dip first the north pole of a magnet and then the south into a jar of pins and then to count the number of pins each pole had attracted. The teacher had explained to the children what they were to do, and each group also had a set of instructions. This group of children are part way through the experiment but have found that all the pins in the jar (numbering about seventy) were attracted to the poles. Having laboriously counted about half of them, they are now questioning the teacher about whether it is necessary to count all the pins, and pointing out to her that all the pins that had been attracted were becoming magnetised.

	STUDENTS	TEACHER
1	how do you get . . . (*to teacher nearby*)	
2		what can I do for you . . are you people on track?
3	Miss do we have to count all the pins?	
4	Miss do we have to count all of them?	
5		what does it say here? look at your task card
6	it says	
7	put them back	
8		so tell me what you've done so far . . what have you done so far
9	like . em we put em both em bars like at a time	
10	Miss they both stuck	
11	put the north pole in and then . . put the south pole in	
12	Miss all of them were	OK well that's exactly what you do . . you have to count how many were attracted to the north pole. can you just show me/ show how you did it
13	they're all stuck to it . . they're all spiky	
14	put them in back into the jar . . .	
15	that's/ do the horseshoe magnet	
16		put them back in/ that's it . . and it says you have to dip/ so put . the jar down in the middle alright
17	jar in the middle	
18		now what you just did then . was you . dipped it 'right in it so that (*indicating the pole*) was touching . . what it means on the task card is just try/ if you put it about half way in like that (*demonstrating*)/ OK until they start . to pick it up (*several pins are attracted upwards and attach to the magnet*)
19	oh cool	
20	could we do it again?	
21		and . what do you need to do now?
22	count it	
23	count them	
24		OK now what pole did we just use then?
25	er . north?	
26	north	
27		so next step will be?
28	the south	
29	south	

Discussion

The teacher's response to the children's difficulty is not to immediately show them what to do. Scaffolding was defined earlier as help which actively assists learners to complete a task which they are unable to complete alone, but it is help to understand rather than simply help to complete. Here the teacher withholds direct help until the students check the task card (5, 6), summarise what they have done so far (8 - 11) and demonstrate how they did it (13-17). Only at this point does the teacher demonstrate part of the experiment, although she does not refer to what the students should do but to what the task card 'means'. Again the sources of meaning are multimodal: the task card; the teacher's interpretation of what it 'means' (*put it about half way in*) and the concrete demonstration. The teacher then sets the students on the path she wants them to take, making this explicit through her three questions (21, 24, 27).

Stage 4: Reflection on the task: making sense of what has been done

It is at this stage that the mediating role of the teacher is most clearly foregrounded. Given that mediation tends to occur in contexts of difference, distance or difficulty (Baynham, forthcoming) this should not be surprising, since it is at this stage that the teacher is concerned with linking children's personal experiences of the experiments with a larger framework of meanings, and with jointly constructing with the children aspects of the new register which realises these new meanings. This stage most clearly distinguishes a neo-Vygotskian approach to teaching from more 'progressive' and process driven approaches, since considerable time is given to the explicit apprenticing of students into the culture and discourse of the subject. Through the scaffolding the teacher provides in the interactional process, she mediates between learners' personal ways of knowing, built up through their engagement with the tasks; and the more public and shared knowledge that represents the subject-specific ways of knowing. The collaborative discourse between student and teacher builds bridges between children's spontaneous knowledge, expressed in the dynamic mode of action and everyday speech in which that action is directed and reported, and the more formal, schooled knowledge which is expressed in the synoptic mode of written language (Lemke 1990a). As already discussed, it is this more academic register that minority learners are least likely to develop without planned intervention. Given the nature of the two classes, it is not surprising, then, that this was the stage which was given the most class time. It included a wide range of interactional patterns, varying from student-initiated interactions where contingent responses by the teacher recast student

meaning into more register appropriate language (discussed in Chapter 5), to teacher-initiated and heavily teacher-controlled interactions where the teacher's questions incorporated strong cues about the response which she expected. This variation, it will later be argued, is not arbitrary.

The texts indicate that the discourse at this stage focuses on two major areas: the cognitive and conceptual aspects of the topic itself, and the linguistic aspects of the scientific register which the students are developing, (again recalling the issue discussed in Chapter 4, where it was argued that the discourse incorporates fields other than science itself). While these focuses cannot of course be clearly separated, since language is the means by which knowledge is realised in the discourse, it appears that teachers 'zoom in' on one or other aspect at particular moments, according to what appears to be the major concern of the teacher at a particular pedagogical moment.

Texts 6.11 - 6.16 illustrate how the teacher makes her own and her students' reasoning and thinking explicit in the discourse, and how she establishes and develops, through the way that she manages the discourse, a particular line of enquiry which is consonant with her own educational objectives. Not surprisingly, perhaps, given that the lessons were sited within the curriculum area of science, texts like the ones included here, which are most overtly concerned with the building up of scientific understandings, are extensive in this stage. This set of texts is glossed as *Mediating thinking: making reasoning explicit.*

Texts 6.17 - 6.19 show the teacher focusing specifically on supporting learners to use aspects of the scientific register. They include not only models of appropriate language by the teacher, but metalinguistic discussion of the language itself, and are glossed as *Mediating language: technicalising the discourse.*

The texts illustrate that in the discourse as a whole there are many common elements of scaffolding. Teachers consistently put new learning in the context of old, they recast individual contributions from students in more registrally appropriate ways, they 'manage' whole class talk by appropriating and recontextualising student responses for their own pedagogical purposes, they signal what is significant in the discourse, and they summarise the group's 'common knowledge'.

Mediating thinking: making reasoning explicit

Effective teaching has been described as not simply knowing what, but of knowing how (Webster et al 1996). Talk between teacher and students therefore needs to incorporate not simply reference to 'facts' but also to the processes of reasoning underpinning them. Through interaction between teacher and students, such reasoning can be made explicit in the discourse through the teacher drawing out from the students a line of reasoning which is congruent with her own teaching objectives. As was suggested in Chapter 2, academic discourse foregrounds and makes explicit this articulation of theoretical knowledge. These texts show the teacher mediating between the observations as perceived by the students, and the reasoning and scientific principles encapsulated in the science curriculum.

Text 6.11
Classroom 1: Episode 7
What do you think she was thinking?

Context

In the text which follows, the action of one of the students during earlier small group work prompted the teacher to draw the attention of the class to what the student might have been thinking. The student had been testing a range of objects to see which were magnetic and which were non-magnetic. A gold-coloured nail was eventually shown to be non-magnetic, but not before the student had ruled out the possibility that its non-attraction by the magnet was simply the result of the nail's weight and the lack of strength of a single magnet. To test this she had used two, then three magnets to find out if the combined strength of the magnets would be enough to attract the nail.

	STUDENTS	TEACHER
1	B: em we put three magnets together/ it still wouldn't hold the gold nail	
2		can you explain that again?
3	B: we/ we tried to put three magnets together . . To hold the gold nail . . Even though we had three magnets . . It wouldn't stick	
4		so . . . She put three magnets together . . . Because she was concerned about that gold nail . . . Where?/ Here it is/ and she said/ she thought well . . Maybe one magnet wasn't strong enough/ is that what you were thinking?
5	B: yes	

6		so she put three magnets together and she said 'even 'though she put three magnets together it 'still wouldn't hold that nail/ why did she put three/ what was she 'thinking? What was she thinking? Gina/ what was she thinking?
7	G: to try each side like if one side is not good then something like that?	
8		is that what you were thinking Belinda?
9	*(B shakes head)*	
10		Colin what do you think she was thinking?
11	C: that she thinks the golden nail was stronger . .	
12		that . that this (*indicating nail*) was stronger/ is that what you mean?
13	C: couldn't em make the magnet go on . . . It was too heavy	
14		she was thinking the nail was a bit heavy so she thought maybe one magnet wasn't strong enough/ but then with 'three magnets it 'still wouldn't attract
15	B: 'ten magnets wouldn't still	
16	M if you 'did twenty it wouldn't work still	
17	S: yeah hundred	

Discussion

This text demonstrates how the foregrounding of theory occurs through the teacher appropriating aspects of a student's thinking. Interestingly this is an appropriation of 'thinking' rather than the more usual 'saying'. Here is perhaps an example of Lotman's reference to text as a 'thinking device' (Lotman 1988); the student's thinking is made explicit and therefore open to challenge. The text also demonstrates again the reciprocal nature of appropriation to which Newman et al refer (Newman et al 1989). As was pointed out in Chapter 2, not only do students appropriate the thinking and discourse of the teacher through the ongoing classroom talk, but teachers also appropriate the thinking and language of their students, in order to draw attention to what students are to see as significant in relation to a broader frame of reference. The appropriation of students' ideas by teachers, when this results in the development of new meanings and ways of thinking, is a powerful form of scaffolding, perhaps particularly empowering for minority learners, since it is the learner's ideas and meanings which lie at the heart of the interaction. Here the teacher draws on the thinking of one of the children, Belinda, in order to make

explicit to the class the concept of non-magnetic material, and to distinguish it from concerns about the weight of the material.

Belinda initially describes what she did (1; 3), implicitly suggesting what she was thinking through the judgement-loaded adjuncts: *still; even though.* The teacher taps into this evidence of thinking, appropriates it and projects it explicitly: *she thought well maybe one magnet wasn't strong enough* (4). Linguistically this is an interesting text because the teacher is quoting a mental act and presenting an idea as a wording. [5] In this data, and probably in classrooms generally, it is more common for a teacher to report a verbal act and present a locution as meaning: *he said that;* than it is to project an idea: *he thought that.* Even less common is the representation of thinking as wording. Where projected elements are quoted rather than reported they are "more immediate and lifelike" (Halliday 1985b, p. 233) since the orientation of the deixis is that of drama rather than narrative. In this instance the quotation provides an exemplification of what the teacher means by 'thinking' thus making her question more concrete.

Checking with Belinda that the projection she has offered is correct, the teacher proceeds with the same line of reasoning: *so she put three magnets together* (4). She then asks again what Belinda was thinking (6), and while Gina's response is clearly wrong the teacher defers to Belinda to respond. Colin's suggestion is taken up by the teacher, who first asks for further clarification: *is that what you mean?* (12) since perhaps the idea of strength is not one which will fit into her current line of reasoning. Colin clarifies his response: *it was too heavy,* a suggestion which the teacher appropriates and embeds into her final comment, which represents the point of this piece of discourse: *but then with three magnets it still wouldn't attract.* The final three comments from the children (15 - 17) demonstrate that this has been well understood, and the talk later continues with a discussion about other materials which are magnetic and non-magnetic.

The kind of reconstructive recapping which is evident in the teacher's contribution allows a re-representation of children's experiences and the events of the classroom in a way which fits the broader pedagogic objectives of the curriculum: here the child's experimentation with the three magnets is reconstructed by the teacher in line with a wider framework of knowledge. Interestingly, however, the teacher continues to acknowledge the *student* as the source of the idea, and continues to defer to her

[5] Note that the quotation slips into what is possibly reporting - note *wasn't* - a projection type which Halliday (1986) refers to as free reporting. However the use of *well,* more typical of actual wording, suggests that this is in fact intended as a quotation.

in evaluating the responses of the other children. Also of significance is the fact that the teacher makes explicit through the discourse what most teachers would claim as a general educational objective, but which is often left implicit: that one function of talk in the classroom discourse is the development of students' reasoning skills. If we are to take seriously Vygotsky's notion of inner and outer speech, then the explicit overt formulation of ideas evident in this piece of discourse should ultimately aid inner speech as well.

Text 6.12
Classroom 1: Episode 11
Magnets stick to some kinds of metal"

Context

Prior to this text, which occurred during a reporting back session, children had first taken part in an initial exploration of magnets, and had then reported back their findings. The teacher then asked them, in small groups, to think of some "general ideas" about magnets, based on what they had found out. The reporting session which followed was based on this small group talk around generalisations about magnets.

	STUDENTS	TEACHER
1	A: magnets stick to some kind of metal	
2		'some kinds of metals/ are you saying/ what does that mean/ they 'don't attract . .
3	A: all metals	
4		they don't attract . . 'all metals . and I think in the other group . they figured that one out too . . so they don't attract and I think maybe that's what you mean (*to the other group*)/ they don't attract all metals/ did we have that down/ yesterday?
5	Ss (*several*) no	
6		so that is something new we've learned then?
7	Ss (*several*) yeah	
8		they . 'don't attract 'all metals . right Rana?
9	R: we thought how about if the golden screw is em . gold and the thumb tack . colour gold as well . how come the thumb tack attracted and the gold screw didn't? and we thought that they might be different metals . and they . . .	aah

10		that was good/ that was very good/ now who else was in that group/ Joseph and Jennifer/ that was very good the way they were talking about that
11	S1: I thought of that	
12		see here's Rana's argument look . . (*demonstrating*) same colour . . the magnet/ the magnet 'didn't attract 'this (*gold screw*) . . but it 'did attract 'this (*thumb tack*)
13	J: and we thought	
14		so Joseph what did you think then .
15	J: and we thought . that . . it was different . different metals . different kind of metals	
16	S1 that's lighter	different kinds of metals . 'so . Amanda read yours again then . it's different kinds of metals . therefore.
17	A: magnets only stick to 'some kinds of metals	
18		only 'some metals
19	A: yes	
20		only 'some

Discussion

This text exemplifies an important characteristic of scaffolding: the marking out by the teacher of what is significant in the discourse and in the new knowledge being constructed. Like the previous text, however, it hinges on what has been initiated by the students.

The teacher first appropriates Amanda's response, but unpacks it through elaboration to underline the point Amanda is making: *does that mean/ they don't attract . .* (2). The teacher's pause suggests a cued elicitation to which Amanda responds by completing the clause: *all metals* (3). The teacher repeats this twice in her response: *they don't attract all metals* (4) and again in turn 7, this time with marked stress which further underlines the message: *they 'don't attract 'all metals.* There is thus a high degree of message redundancy, which continues throughout the text, making this piece of information very explicit. The significance of the new knowledge is further marked by the teacher. First she asks the question: *did we have that down yesterday?* (4), (referring to a brainstorm, prior to the students beginning the topic, when they reported what they already knew about magnets). Secondly the status of the new knowledge is marked by her comment: *that is something new we've learned* (6). This marking of the significance of the new knowledge also functions to encourage students' meta-cognitive awareness, as they are helped to

recognise and reflect on this step in their learning. The use of *we* positions the teacher alongside the students in what is being presented as a cooperative enquiry, (although a more coercive reading could be given to this use of 'we', an issue which is taken up in the conclusions of this chapter in the section *Who is saying what?*)

Rana's contribution is clearly related to the understandings the teacher is helping the students construct, and she poses both a question: *how come the thumb tack attracted and the gold screw didn't?* and an answer: *we thought they were different metals* (9). The overlapping *aah* from the teacher suggests her positive evaluation of this contribution, and her next move (10) is a further evaluation: she comments positively on *the way they were talking about that.* This is a significant interaction in that a student initiates a question, a relatively rare event (Webster et al, 1996) and also reports on the *thinking* of the group rather than giving procedural information. In addition the teacher's evaluative comment is in terms of the quality of student talk, rather than the 'correctness' of the information.

The teacher subsequently appropriates Rana's contribution, not by reconstructing it into a more decontextualised register, but by doing the reverse, demonstrating what Rana is describing using the materials themselves and pointing out that, as Rana suggests, they are the same colour. This demonstration is introduced and 'named' as *Rana's argument*. Again, and as we have seen in other texts, the teacher appropriates students' ideas, but continues to acknowledge their source throughout the discourse, thus modifying the knowledge asymmetry and suggesting a greater equality of status within the discourse. Joseph's comment (15) repeats the same piece of information, which the teacher again appropriates before returning to Amanda and asking her to read once more her initial contribution to the discussion (16). At this point the teacher reminds the children of the line of reasoning they are jointly building up, by summarising the understanding so far: *different kinds of metal,* and then adding an explicit logical conjunction, *therefore,* which both marks the progress of the discussion to this point and pushes the discourse forward by indicating the conclusion of the argument. The teacher's focus on this conjunction is significant for two reasons. First, conjunctions may be a late development in students' second language (Lock 1983; McKay 1992), perhaps precisely because they are often a feature of more academic and written like registers, and second, (as in the previous text) the explicit formulation of the argument throughout the discourse is likely to aid the development of students' inner speech.

Amanda's wording (17) encapsulates a subtle but significant change. This time she refers to *metals* rather than *metal,* perhaps a recognition that this is a more accurate

way to express the meaning in this context, and in addition, she adds the adjunct *only* and a marked stress on *some*: *only 'some metals* . Like the teacher, she is now able to mark what is significant in her original message.

The text concludes with the teacher twice repeating the same wording (18, 20), resulting in what overall is a heavily message-redundant text which makes very explicit to students what they are to see as significant in this aspect of their learning. The text also illustrates how a skilled teacher mediates between students' personal and specific learning and the generalisations that can be drawn from it. In this text, both specific and generalised learning is articulated, and the relationship between them is explicitly articulated through the discourse.

Text 6.13
Classroom 1: Episode 23
So what's the general idea?

Context

This text occurred after the children had carried out activities to test the relative strengths of a bar magnet and a horseshoe magnet.

	STUDENTS	TEACHER
1		what did the group up here that was making a chain they were working with a bar magnet and a horse shoe magnet/ what did you find out Mario?
2	M: I found out that the bar magnet only carries five em em five . . .	
3		paper clips
4	M: paper clips and the horse shoe only carries three	
5		so what do you find out from that then?
6	M: the bar magnet is stronger? the bar magnet attracted more than the horse shoe magnet	
7		alright good is that the same results as George got on his experiment?
8	Ss (*several*): yes	
9		yes/ so carrying chains and doing the attracting on the paper is . . it was the same/ em who else did this one over here/ did you? (*to Jennifer*) big big voice please
10	J: the blue bar magnet has more than the red one	
11		oh the blue one had more than the red one/ that's interesting/ what about the horse shoe magnet

12	J: less	
13		fewer fewer chains/ so what's what's the general idea then
14	J: the . . . the blue bar magnet carries more than the red one	
15		so the blue magnet is . . ?
16	J: stronger	
17		stronger
18	J: than the other	
19		the strongest

Discussion

Here the teacher draws on the activities that the children have just completed: once again their experiences and current understandings are the starting point for the teacher to develop a specific line of reasoning, and children's own discoveries are placed within a broader framework of understanding. The text demonstrates how, through the appropriation of the students' contributions by the teacher, discourse is constructed which bears traces of students' meanings while it is in the process of becoming the authoritative discourse of the subject.

The teacher is concerned not that children have simply 'discovered' things but that they will begin to articulate the 'general idea', specifically, that they can begin to see the common threads in the learnings of different experiments. The children are in no way left to make this connection themselves: it is made explicit to them by the teacher on four occasions:

(5) so what do you find out from that then?

(7) is that the same results as George got on his experiment?

(9) so carrying chains and doing the attracting on the paper (*referring to two of the experiments*) . . . was the same

(13) so what's the general idea then?

This link with children's previous experiences to ideas currently being worked on is significant in helping children adapt or develop concepts. Webster et al (1996) refer to this use of previous information and events, and the highlighting of similarities and differences between existing conceptual frameworks and new information, as 'strategic conceptual bridges'. The 'bridges' metaphor is embedded in the notion of mediation, here the mediation between students' existing understandings and the way the information is coded in the thematics of the curriculum.

The shared understandings that this leads to is illustrated by the final six utterances (14 -19) which are jointly negotiated across the six turns, with the

teacher using the students' contributions to push the thinking ahead and produce a jointly constructed meaning which is congruent with the line of reasoning she is seeking to develop.

S: the . . . the blue bar magnet carries more than the red one
T: so the blue magnet is . . ?
S: stronger
T: stronger
S: than the other
T: the strongest

Text 6.14
Classroom 2: Episode 23
Something in common with the results

Context

This text occurred after three groups had reported back to the class about their experiments, all of which had demonstrated how like poles repel and unlike attract. The teacher is talking with the children about the common results they obtained from different experiments.

	STUDENTS	TEACHER
1	ohh *(many bids)* ohh	OK thank you . . . three experiments and you all did very well/ three experiments/ three experiments . . . . . and if you'd listened carefully . . . you could find that there was something in common . . . with the results of all three experiments
2	oh Miss Miss	
3	Miss	
4		there's something in common if you listened to the results and the descriptions . . that were used . and/ that was similar in 'all . 'three . experiments. Janet would you like to tell us what you think
5	J: em Miss when they first put the magnet em on one side . . em it attracted . but em repelled . . and the next time they did it they put the magnet on the other side and some of the repel/ the * that did it the first time it repelled/ em it attracted next	

6		so there was like an 'opposite. OK why/ why do you think that might be happening/ she's exactly right . . where the groups put the two magnets together and they found out they either attracted . they turned it round and then they repelled . . or . they repelled first of all. they turned around and attracted/ the magnets attracted to each other/ Andre?
7	A: em because Miss . the . magnet which you put on the other magnet which you turned around . . it's not the . . like it wouldn't stick to it because. it's it's the wrong one . . and it can still feel . . the . . other side of the . thing so it turned around and it touches to it	mmm
8		what do you mean the/ what do you mean "the 'wrong 'one"/ it was interesting that you used the language "the wrong one"
9	A: Miss the one like	
10		difficult to explain I know because I know exactly what you mean/ we're just trying to find the 'language . to explain/ Fabiola
11	F: in the magnet like you em it has to have one side that attaches and the other side that pulls away?	
12		right so each magnet has one . we've got the 'poles haven't we on either end of the magnet/ OK and you're saying . . ?
13	F: that em one side em attaches and the other side pulls away	
14		OK . . alright yes you/ that's exactly what happens/ can anyone expand on that a little bit further?. . Duncan
15	D: em the two poles they like to like er stick to some things * or otherwise they will pull away/ stick to something something that ***	
16		so you're saying that you've got a pole on each end . . and one pole will only stick to some things
17	D: yes whereas others em the other one will stick to others the other one won't stick	
18		to the opposite one/ to the one on the different magnet OK/ Diana

19	D: em the/ the em the magnets have different sides/ one that attaches and the other one that goes away and when you put the the two that attach togeth- . the the both sides that attach together they will attach together but if you turn one . you em . would go away and turn to the other side when it attach	
20		it will repel and then it will try and attach to the other side/ you're exactly right/ exactly right/ Janet?
21	J: Miss it 's like negative and positive	
22	J: yes	that's exactly what it's like isn't it/ where have you encountered the terms negative and positive. you've heard that/ they're 'opposites aren't they/ you're right and it's exactly what we're talking about/ we're talking about opposites/ I don't know if you noticed. . when we were working with these magnets before/ you probably/ you were mainly looking at what they attracted to and what they didn't attract to . . on these red magnets. . there is a 'circle marked on one end
23	oh/ oh (*several, indicating understanding*)	
24		the blue ones . . silver whatever . bluey silver . . did someone notice what was on the end
25	yes yes	
26	*(several)*negative	you're right/ it has . . . you see that N . . marked on there
27	negative	
28	negative	
29		OK it's it's an N that 'does stand for something/ you're right it 'doesn't stand for negative . . it actually/ does anyone know what it might stand for
30	emm	
31	*(several)* no	
32		it actually stands for North
33	ohhh ohhh *(loudly)*	
34	S1: and south north . north south	
35	S:2 north	exactly right . and that's . . you've heard of the north pole

36	J: em they stick it together	and the south pole
37		therefore . . let's look at this . . . there's my . north there . . and my north there/ if I put the 'two. 'norths together. who can predict what they think 'might happen/ Marcel?
38	M: Miss em Miss first they the * will go like that (*demonstrating by putting hands apart*)	
39		you think they will repel?
40	M: yes	
41		shall we try? well I'll try first and tell you
42	S 3: oh yes	
43		(*demonstrating*) exactly/ they are repelling
44	M: Miss it it's pull/ it's pulling	
45	S4: pulling	
46	S5: ohh can S6: ohh	
47		do you want someone else want to come and prove that I'm not * that/ right here you go/ I'll let you have the magnets in a moment and you can try for yourself . . what's it doing (*gives magnets to Milad*)
48	S7: pushing it away	
49		it's repelling isn't it . . alright . . come out here Milad . . .
50	M: it's like a strong wind	
51		what about . . if I turned around . . I've got this pole which is the opposite to north it's the . ?
52	south south (*many voices*)	

Discussion

Like the previous text, the teacher is here scaffolding for the children how they should be thinking about their own experiments, and once more mediating between their personal experiences and broader scientific principles. She begins by asking the children to consider what was *in common with the results of all three experiments.* Many children are very keen to answer but as some children are not yet responding the teacher repeats the phrase *in common,* paraphrasing this as *similar in all three experiments.* (4) *All three experiments* is given considerable emphasis, with a pause between each word and stress on all three words. This makes very explicit the nature of the response required (ie. not an individual recount of an experiment) and the topic of the discourse that follows. This message redundancy also gives less

competent language users more opportunities to process what they are being asked and thus to participate in the discourse.

Despite the fact that the children appear to understand the teacher's question they are not yet able to clearly articulate the generalisation she is seeking (5 and 7). Andre's use of the term *the wrong one* is appropriated by the teacher since she appears to perceive it as potentially able to be incorporated into the line of thinking which she is trying to construct. Her comment responds to the student's meaning (*I know exactly what you mean*) acknowledging the problem the student is having in explaining as *just trying to find the language to explain.* Again there is a sensitivity to the communication difficulties of the children, while at the same time their 'thinking' is not discounted. In turn 12 the teacher again appropriates the thinking of a student, cohesively linking the student contribution to her own and also pushing the reasoning forward with *so . . . we've got the pole.* Turns 12 and 13, where the student completes the teacher's utterance, suggest the reciprocal nature of the dialogue between teacher and student at this point, as the teacher invites the student to continue with the line of reasoning they are collaboratively building up. The response is still along the lines that one pole attracts and the other repels whereas what the teacher is seeking is the understanding that it is the *relative* positions of the poles of two magnets which is significant. She invites Duncan to expand on what has been said, but it is still not clear whether the children have recognised the key relationship between the poles (15-20). Janet's comment *it's like negative and positive* (21), like Andre's earlier contribution, is appropriated by the teacher because of its obvious congruence with her own line of reasoning. The teacher expands on what Janet has said over the next several turns, finally providing the term *north* (32). It is significant that it is not until this point, after the children have been struggling with a number of concepts in response to the teacher's initial question (1) that the teacher finally provides the term which appears to be the scaffold they need in order to reach the understanding that the teacher is seeking to develop. This is not, I believe, simply an example of 'guess what's in the teacher's mind', but rather an example of contingency, the way in which a skilled teacher can 'keep pace' with children's thinking while at the same time providing closely tuned support when that pace slackens and thinking begins to lead nowhere.

Turns 32-57 show the children applying the learning that has now been constructed by predicting what will happen in each of the situations the teacher sets up (36, 46, 52). Having reached this degree of shared knowledge, the teacher later in the discourse (text not included) acknowledges that it is in origin the students' idea: *this is exactly what you were saying* . She thereby legitimises the students' earlier findings

as relevant within the new piece of knowledge that has now been constructed. At this point — and not until then, when it appears that the understandings she has sought to build up have been appropriated by the class — does the teacher ask the students to write a generalisation about what they had found out, a task that is now within their capabilities (see text 5.39). Without the scaffolding provided through the discourse to help students see the generalisability of their findings, the ability of the students to do this subsequent writing task can be questioned.

Text 6.15
Classroom 1: Episode 16
Why was it going around and around?

Context

This text occurred towards the end of a reporting session. It refers to an experiment in which the children had tied one bar magnet to a frame and had pointed each pole of a second magnet, in turn, at the hanging magnet. Repulsion causes the hanging magnet to spin rapidly. After the children have described what happened, the teacher asks them to demonstrate it, and at this point helps them make explicit what had occurred and why.

	STUDENTS	TEACHER
1		alright would you demonstrate that?
2	(*M: demonstrates*)	look at that/ it looks like it's alive
3	S: it's attracting	
4		what pole what pole are you pointing with there Maroun?
5	M: Miss/ the north	
6		the north and what pole were you aiming at there?
7	M: the north	
8		so Josephine what was happening there/ why was it going around and around
9	J: cos the north . . . the magnet . em the magnet with Maroun . . . . repelled	
10		mm
11	J: the other magnet . . .	
12		not quite just the other magnet/ what what pole repelled?
13	J: the north	
14		the north and the . . . ?
15	J: the north	
16		good/ would the same thing happen with the south and the south?
17	J: yes	

18		OK can we try it? could we try it?
19	*(Ss demonstrate)* look	
20	M: Miss it does	
21		does it work? the same way?
22	M: yes	
23		oh wow . . so what does that show Bernadette?
24	B: shows that that's the north *(several)*	
25		excuse me people Bernadette is speaking . . .
26	B: if you put the two souths or the two norths together it will repel	
27		they will . . . ?
28	repel	
29		so we've just shown both cases/ good very very good.

Discussion

As in many other examples, here the teacher is working towards a generalisation based on the individual group activities, this time concerning the poles of a magnet. Once again she is mediating between the individual experiences of the student and broader scientific principles. The students had already recounted what they had found out, and the teacher's aim is now to get the students to say what the experiments show. Clearly this is a key point in the children's development of understanding, and rather than leave the reasoning implicit, and the students to make their own conclusions, the teacher's draws out the conclusions from the students in a piece of discourse with a strong 'IRF' flavour. This is achieved through a large number of questions, which make up almost all her contributions in this section of the discourse (4, 6, 8, 12,16, 21, 23). Where a student's response is not sufficiently precise, she probes further. In her questioning of Josephine, she provides a key lexical item *pole* which cues Josephine to think in the way the teacher wants: (13-15). The repetition of *the same* to focus the students on the fact that the results are identical: *the same thing*, (16); *the same way* (21); and the comment in 29 that they had now shown *both cases*, foreground the broader scientific principles and particular lines of reasoning that are being built up.

Text 6.16
Classroom 2: Episode 31
What was the point there?

Context

In the previous lesson the students had taken part in a number of experiments designed to show that the north and south poles of a bar magnet are of equal strength, but that the middle of the magnet has a weaker magnetic field. At this

point the students are being asked to restate this learning, not in terms of personal recounts as they had done earlier, but in terms of 'the point' of the experiments. The first experiment to which the teacher refers required the children to see how long a chain of paper clips could be made with each pole of the magnet. The second experiment required the children to dip each pole into a jar of pins, and then to count the pins. In the previous lesson the children had produced spoken recounts of what they had found in the individual experiments.

	STUDENTS	TEACHER
1		so what we had to do / was the 'more paper clips that were . attached to the chain obviously . the . . can you finish that sentence for me?
2	S1: the more	
3	S2: the more chain we had	
4		the stronger?
5	S1: the magnets	
6		the magnet was/ and we had to use different sorts of magnets . alright/ what about the jar of pins/ what was the point there?
7	oh oh (*many bids to answer*)	
8		tell us what we had to do there Duncan
9	D: em we had to dip the magnet in the middle of the jar to . find em . come up the pins	
10		to see the pins/ how 'many pins were . ?
11	S2: attracted (*several*)	
12	to the magnet (*several*)	attracted 'to the magnet/ that's right/ we had to use the north pole/ the south pole and . ?
13	the middle (*several*)	
14		of the magnet/ we 'also . . I asked you if you had the chance to use . 'different sorts of magnets there again too/ once again thinking as a scientist . what do you think the point of an experiment like that would be . . . what were we trying to prove?
15	D: to see how strong the magnet was?	
16		to see how strong the magnets were and to see how strong the different . . . .?
17	parts (several)	parts and poles were

Discussion

The mediation of the teacher is realised here by an interaction strategy which overtly and explicitly controls the 'content' of the discourse, described by Edwards and Mercer (1987) as cued elicitation. This refers to the kind of IRF discourse in which the teacher asks questions while simultaneously providing heavy clues and prompts as to the type of information being asked for, and which they suggest functions as a way of marking the significance of certain elements of knowledge in the discourse. They suggest that it embodies an educational process in which pupils are not being 'drawn out' of themselves in the sense of e-ducare, nor are they receiving direct instruction in the 'transmission' sense. Rather they are being initiated into a shared discourse while actively participating in its creation. Edwards and Westgate (1994) and Edwards and Mercer (1987) warn however that this kind of interactional pattern may give an *appearance* of an understanding that is not actually present — thus masking rather than bridging the gap between teacher and students. Cued elicitation can serve to maintain the appearance that knowledge and understanding are being elicited from the students rather than being imposed by the teacher. Edwards (1992) also suggests that such questioning techniques often serve "to focus pupils' attention away from any argument or conclusion which might be emerging from the 'discussion', and towards whatever cues and clues the teacher might be providing as to what he or she is after" (Edwards 1992, p. 236).

However, as has already been argued (Chapter 3), to attempt to analyse what is actually occurring in a classroom it is necessary to locate specific interactions within the ongoing discourse over a number of teaching episodes. The examples of cued elicitation in this text occurred after children had spent considerable time building up their understanding of the topic in concrete and comprehensible contexts. It may be assumed therefore that the responses they give are, to use Edwards and Mercer's terms, principled rather than simply ritualised and procedural. I therefore include these examples of cued elicitation as examples of scaffolding, with the proviso that not all interactions of this structural type could be so defined: it is not cued elicitation per se which provides the scaffolding here, but its existence at a point when jointly constructed understandings have already been built up by teacher and students across a number of lessons, and when students are being required to redefine or recontextualise these understandings in less familiar ways. Lemke (1990a) uses the term 'joint construction' specifically to refer to those occasions when teacher and students complete each others' contributions in this way, and suggests that this happens when the thematic development of the dialogue is closely shared. This text can therefore be interpreted as indicating the learning that the children have achieved at this point in the sequence of episodes.

The responses are 'cued' by a 'fill in the blank' technique, the teacher leaving the end of the sentence unfinished for the students to complete (1, 4, 10, 12, 16). This enables her to simultaneously draw the children's attention to what is significant and salient, (from the point of view of her frame of reference), while leaving key (and at the start of the unit, unknown) lexis to be provided by the children: *magnets, attracted to the magnet, poles.* Where this does not quite conform to her own 'script', she provides the word which she is seeking, incorporating the student's response into her own script through expansion:

Student: parts
Teacher: parts *and poles* were.

The degree to which this discourse now represents shared knowledge is indicated by the closely juxtaposed utterances, with each student utterance following on immediately from the teacher's and at times overlapping. We can note too the relative ease with which the children can predict what the teacher is expecting, so that 'the sentence' which the teacher asks them to finish is in fact jointly constructed across several turns:

Teacher: the more paper clips that were attached to the chain
Student: the more
the more chain we had
Teacher: the stronger?
Student: the magnets
Teacher: the magnet was.

Teacher intervention is required only once in the completion of this sentence (4) where the children have failed to recognise the syntactic structure that the teacher is seeking: *the more pins . . . the stronger the magnet.* This prompt again illustrates the contingency to which skilled teachers are sensitive, and which is inherent in effective scaffolding.

The purpose of the scaffolding here is not simply to help the children to recount what had happened, (a task which would probably not have required this degree of scaffolding), but to provide support in helping them to identify the 'point' of the experiments, and hence to think about their personal experiences in a more decentred way. The children's own discoveries are thereby made explicit and legitimised by the teacher, and become part of the shared understanding of the

group, or what Mercer (1995) refers to as 'common knowledge'. The teacher's reference to *thinking like a scientist* is significant. Effective learning is not simply the memorisation of rote facts, but involves the acquisition of the processes underpinning the subject, so that children are led to internalise some of the thought processes of a historian, a scientist, a mathematician (Webster et al 1996), and here the teacher makes explicit reference to this process. The scaffolding in this piece of discourse effectively supports the learners in a step towards achieving the goal of 'thinking like a scientist'.

Mediating language: technicalising the talk

Lemke (1990a) argues that part of the teacher's job in teaching students to 'talk science' is to focus on those aspects of language which are peculiar to science. He argues that teachers should:

> model scientific language by explaining to students how they themselves are combining terms together in sentences. They should stop to point out special idioms and phrases, forms of grammar ... and especially ... identify the semantic relations of terms and the various ways of expressing the same relationship in different words.
> (Lemke 1990a, p. 170)

The mediation illustrated by the texts in this section is concerned with this aspect of science teaching; the scaffolding provided by the teacher provides a link between the everyday language of the students and the subject specific ways of meaning.

Text 6.17
Classroom 1: Episode 17
The north pole and the south pole attract

Context

This interaction (also discussed in Chapter 5) occurred immediately after an episode when the children had reported back on what had happened in their group experiments. On the board is a matrix to which the teacher is referring (see Figure 5. 3 in the previous chapter)

	STUDENTS	TEACHER
1		let's just see if we can . . . Belinda . . . let's just see if we can . . figure out something here . . if I put the pole of the first magnet . . the *north* pole . . to the north pole of the second magnet what will happen the north pole of one magnet and I try to put it on the . . by the north pole of the second magnet what will happen . . . George?
2	G: they repel?	
3	S: repel	alright so I'll just put a little tick like that . . so the north pole and the north pole/repel
4		let's try this what if I try the north pole and the south pole . . of the magnet . . who can tell . . I want a sentence a nice sentence Carol Ann?
5	C: the north pole and the south pole attract	
6		T good . . . what if I try the south pole of this magnet and the north pole of that magnet . . yes Francois come on a sentence
7	F: the south pole and the north pole will attract	
8		T good boy good Francois alright and let's try the south pole of this magnet and the south pole of the other magnet . . . Stephanie
9	S: the south pole and the south pole will re . . repel	
10		so I would like two ideas that we get from this . . two *general* ideas what we call *generalisations* . . . who can give me something that will happen *all* the time not what just happened to us today but what will happen do you think . . . Gina do you want to try
11	G: if you put the north pole and the north pole together em that will not . . . . that will repel and if you put the south pole and the south pole together that will repel too	
12		good alright that will *always* happen so we'll say south pole and south pole . . . ?
13	Ss (*several*): repel	
14		north pole and north pole . . . ?
15	Ss (*several*): repel	
16		alright . . who can give me something else . . Jennifer

17	J: em . . the north pole and the south pole attract	
18		right they attract . . each other . . north pole and south pole attract each other . . right

Discussion

Lemke's argument for the importance of visual semiotic resources in the construction and mediation of meaning, referred to in Chapter 5, is of particular significance in relation to the notion of scaffolding. Scaffolding may work in tandem with an additional semiotic resource, to create a multimodal resource for making meaning (see for example, text 6.7: *I'll just do this one as an example*). In this case the matrix on the board drawn up by the teacher serves as a parallel semiotic system and provides a visual frame of reference for the more decontextualised language the teacher is wanting the students to use. At the same time, as the teacher completes the matrix by ticking the appropriate boxes, the children are presented with an alternative semiotic system by which they can represent the information they have built up.

The teacher appears to be playing the kind of mediating role which Goodman describes (see *Introduction*, this chapter): namely that in mediation the teacher helps students develop schemes which will move them toward scientific understanding by first involving them in personal experiences in which they will experience the forces at work, and then by incorporating these into their attempt to make sense of the phenomena. In this text the teacher mediates between the children's personal experiences and the generalisations which she is seeking to develop by providing three kinds of scaffolds for the children by which she embeds their individual findings within a broader framework of meanings. First, (turns 1 - 9) she makes use of an additional and parallel semiotic resource (the matrix on the board). Second there is the use of metalinguistic talk concerning the nature of generalisations (turns 10 - 19). Third, there is a brief but significant example of cued elicitation. Each of these will be discussed.

As pointed out in Chapter 5, the provision of the matrix in this instance is especially relevant to a context where students are learning both a second language and curriculum content in the second language. The matrix presents part of the semantic or propositional content as 'given' and the student can therefore focus more specifically on the form: this presumably would help to fulfil the condition that Swain argues for, namely that the learner give attention to comprehensible (and here registrally appropriate) output. It is significant that Francois, a child on a

special education program and an ESL learner, is able through the scaffolding from the teacher and that provided by the model of the previous student, to produce such output (7).

In the latter part of the text, the teacher talks explicitly about the notion of a generalisation. The teacher talk in fact here encapsulates two fields (as defined in Chapter 4), that of science and that of language itself. The relationship between these within the progression of the discourse is a significant factor in the scaffolding the teacher is providing. To give a more visual representation of the role these two fields play, the transcription of the teacher talk has been separated into talk about magnets and talk about language (Figure 6.4).

Fig 6.4 Two fields within the discourse

		Teacher Field- language	**Teacher Field - science**
1			let's try this what if I try the north pole and the south pole . . of the magnet . . who can tell . .
2		I want a sentence a nice sentence Carol Ann?	
3	C: the north pole and the south pole attract		
4			good . . . what if I try the south pole of this magnet and the north pole of that magnet . . yes Francois
5		come on a sentence	
6	F: the south pole and the north pole will attract		
7			good boy good Francois south alright and let's try the pole of this magnet and the south pole of the other magnet . . . Stephanie
8	S: the south pole and the south pole will re . . repel		

9		good (to obs) my goodness aren't they speaking well so I would like two ideas that we get from this . . two *general* ideas what we call *generalisations* . . . who can give me something that will happen *all* the time not what just happened to us today	
10			. . . Gina do you want to try
11	if you put the north pole and the north pole together em that will not . . . . that will repel and if you put the south pole and the south pole together that will repel too		
12		good alright that will *always* happen so we'll say	
13			south pole and south pole . . . ?
14	SS: repel		
15			north pole and north pole . . . ?
16	SS: repel		
17			alright . . who can give me something else . . Jennifer
18	em . . the north pole and the south pole attract		
19			right they attract . . each other . . north pole and south pole attract each other . . right

The field of language here involves talk *about* language which is intended to help students understand the concept of 'generalisation' and produce their understandings in a more written-like form. The metalanguage includes reference to

the fact that the teacher wishes the students to use a 'sentence' (2, 5), and several formulations of what the teacher means by 'generalisation': *two general ideas/ generalisations/ something that will happen all the time/ not what just happened to us today* (9). As the dialogue progresses, however, the language field progressively 'drops out' of the teacher talk as students begin to master the structure of the generalisation without her help.

Further scaffolding is provided through cued elicitation, the 'unfinished' sentence signalled by a rising/questioning intonation pattern (13, 15), and completed by the students (14, 16). This scaffolding also reduces, and Jennifer's response (18) is a complete clause, which, while syntactically parallel with the previous responses, contains different information and indicates how the new learning has now been appropriated and transferred by the student.

The text thus illustrates three forms of scaffolding which realise the teacher's mediating role in this instance, the visual semiotic, the metalinguistic talk and the cued elicitation. What is of particular interest however is the way in which this scaffolding is progressively discarded as students begin to show they can produce the target language alone. It shows how, in Wood's terms, the scaffolding "withers away" as the learner becomes more competent at the particular task (Wood 1986).

Text 6.18
Classroom 1: Episode 8
Remember we're scientists

Context

In this text, and the one which follows it, the teacher plays a highly controlling role, with most of the exchanges being of the IRF type and incorporating many examples of cued elicitation. Much of the discourse, in fact, appears reminiscent of the uncontextualised 'language drill' common in many behaviourist approaches to second language teaching in the 1960's. As has been argued, however, the pedagogical significance of texts, how they are 'read', cannot be uncovered without considering their place within the ongoing discourse which has been built up over time. The intertextual nature of classroom events, as discussed in Chapter 5, means that any interactional sequence is simply an 'excerpt' of a much larger piece of discourse, namely the total discourse of the subject or topic to date. Thus the meaning and nature of a particular interaction can only be understood in terms of the situational context and ongoing discourse in which it occurs. [6]

[6] From the perspective of methodology, this text is an argument for looking beyond the formal structural characteristics of classroom interactions.

The text occurred after the children had taken part in open-ended experiential work with magnets and a range of magnetic and non-magnetic materials, and after they had reported on what they had found out. Until this point there had been no explicit focus on language, and the children had used everyday informal talk to report on what they had done, for example *grabs it, sticks to it* and *attaches* to describe the process of attraction.

An extended section of discourse is necessary here in order to show how the scaffolding proceeds, and how it is progressively discarded as students learn to use aspects of the new register.

	STUDENTS	TEACHER
1	attract attract	I want you to think . of just what you did yesterday/ of the materials . that we had yesterday/ and I'm going to help you with a word today . that we didn't . . . no one has said/ because remember we're scientists . and we need to use the proper words . all of you 'told me . and explained it very well/ now we're going to learn the proper scientific words for this . what happens is . that magnets 'attract (great emphasis) . certain things and so rather than say that it grabs it or it sticks to it . what we say is magnets attract and that means . this kind of thing (*demonstrating*) so if I . am a magnet and I attract . Carol Anne I . . 'bring 'her 'to 'me (*demonstrating*) . attract . so I'd like for us to think of the other things . that the magnet
2	attracts	
3		attract'ed . this is yesterday/ now think back in your groups . think of the things that the magnet attracted . (*writes "attracted "on board*) and then think of the things that the magnet
4	G: didn't	

5		didn't attract . . that 'didn't attract (*writes 'didn't attract ' on board*) and I'd like for you to say it in a sentence so we get used . to our proper scientific language . OK Joseph . either one
6	J: em . the golden nail . . em the magnet . didn't attract the golden screw	
7		alright it didn't attract the . .
8	J: golden screw	
9		it didn't attract the golden screw
10	V: it didn't attract the . .	
11		careful
12	V: em the magnet attracted the nail	
13		the nail . .Francis? can you give me one of these/ think in your group
14	F: the magnet attracts to	
15		careful this is what we did yesterday
16	F: the magnet attract.ed attracted to the other magnets	
17		the magnet attract'ed . other magnets/ we don't need to say the 'to' . so tell me again Francis
18	F: the magnet attracted the other magnets	
19		(*nods at Francois*)
20	Fr: the magnet attract.ed to the em that thing that has em ***	
21		these are the things that we had (*pointing to materials*) . . what are you thinking of?
	Fr. points	
22	V: paper clip	
23		paper clip . . and we had two different types of paper clips . .
24	Fr: silver and iron one	
25		we have/ this is a plastic/ is it a plastic paper clip?
26	Ss: no (*many*)	
27		we thought it was . but what do we call this plastic ?
28	S1: covered	
29		covered or plastic coated/ where are the other paper clips? here they are/ did the magnet attract this paper clip?
30	Ss: yes (*many*)	
31		did the magnet attract this paper clip?
32	Ss: yes (*many*)	
33		so Francois can you tell me/ the magnet attracted. . ?

34	Fr: the magnet attracted to the paper clip	
35		the magnet attracted the plastic coated . we don't need to say the 'to'/ the magnet attracted . the plastic coated paper clip/ you tell me
36	Fr: the magnet attracted . to the plastic . covered paper clip	
37		let's try it once more Francois . . Francois you don't need to say the 'to' listen to me/ the magnet attracted . . the plastic coated/ plastic covered paper clip
38	Fr: the magnet attracted . . /magnet . . the . magnet . . the plastic paper clip	
39		good boy good . anything else anybody? Rena
40	R: the magnet attracted the thumb tacks	
41		Charlene? . . think of all the things that we've got Charlene
42	C: the magnet didn't attract to the cork/ didn't attract to the cork	
43		the magnet . didn't attract the cork/ the magnet didn't attract the cork/ tell me again Charlene
44	C: the magnet didn't attract the cork	
45		good/ Joseph
46	J: the magnet didn't attract the coin?	
47		which one Joseph? . I had a two cent coin and a five cent coin/ they're different colours
48	J: the five cents coin?	
49		Gina
50	G: the cork doesn't stick on it	
51		good so magnets
52	G: the magnet doesn't stick on the . . cork	
53		tell me
54	G: the magnet doesn't stick onto the cork	
55		remember we're scientists now Gina .
56	G: em. ah! the magnet attracts	
57		the magnet .?
58	G: the magnet 'didn't attract the cork	
59		good/ alright/Philip

	The discourse continues in a similar manner for several minutes	
60	Fr: the magnet attracted the	
61		good boy
62	Fr: paper clip	
63		good boy
64	S3: we had that	
65		no we had the plastic one
66	S4: the plastic covered one	
67		OK . . now . . .could I just have us 'say it . because I want to make certain that we can/ we can talk like scientists . so if I point to something I'm going to call on people and see if we can just say it in sentences properly/ I'll start/ the magnet attracted . the nail . the magnet 'didn't attract the plastic top/ Vivienne
68	V: the . the . mag magnet didn't attract the two cent coin	
69		Amanda
70	A: the magnets attracted the lid	
71		Belinda
72	B: the . . magnets didn't attract the five cent coin	
73		good Belinda
74	S: the magnet attracted . the other magnets	
75		good Silvio
76	M: the magnet attracted the plastic covered . clip	
77		good Mario
78	Fr: the magnet attached/ attract/ attracted	
79		attracted good boy
80	Fr: the thumb/ thumb tack	

Discussion

Here the teacher is providing a strong scaffold for the children to begin to use a more scientific and written like register for talking about their learning. The teacher focuses in particular on the lexical item *attract* and on the use of the past tense to refer to what the children had done on the previous day. The text is an example of a 'zooming in' technique, whereby a teacher departs briefly from the broader contextual landscape to foreground and bring to children's attention a significant detail, before refocusing again on the wider landscape. In this case, and in the text which follows it, the 'zooming in' relates to the particular linguistic support the teacher perceives the ESL learners to need.

The teacher begins this piece of discourse by talking explicitly about language, acknowledging that *all of you told me and explained very well* [what you did], but pointing out that now the students are going to use *the proper scientific words.* The emphasis here is not simply on formal correctness, but on appropriacy, because *we're scientists.* Scientific language is mentioned several more times (see turns 5, 55, 67). The teacher thus makes explicit to children why they are being asked to respond in this way. Like the text which follows, this text has a 'drill-like' pattern reminiscent of the 'pattern practice' of audio-lingual approaches. Such pattern practice, however, took minimal account of context and was functionally empty. Here, by contrast, talk about language, and formal language practice, takes place in the context of actual language-in-use: despite the formality and focus on a particular 'structure', what the students say comes out of their understanding of the experiential work they have taken part in, and is thus a recontextualisation of their understandings rather than a rehearsal of language form devoid of speaker meanings. Van Lier (1996) makes the point that the IRF is advantageous only insofar as it is designed as a way of scaffolding interaction, and must therefore promote handover so that students can learn to handle more dialogic forms of discourse. Here it appears to be used for this purpose.

One of Lemke's recommendations to secondary science teachers is that students should be shown how to combine science terms in complex sentences (1990a). It is unclear exactly what the term 'complex' might imply for younger students; however this text provides an instance of the kind of practice Lemke appears to be arguing for when he suggests that:

> [Students] should be practising the use of one particular thematic pattern of semantic relationships among scientific terms ... Following this they should use the terms in writing sentences and paragraphs deriving directly from oral discussion ... [The work of the teacher] is not simply to set up these situations and tasks, but to teach the students explicitly to use scientific language.
> (Lemke 1990a, p. 169)

The text falls into three parts. In turns 1 - 5 the teacher introduces and teaches the word 'attract'. In turns 6 - 66 the children are asked to talk about their findings beginning with 'the magnet attracted' or 'the magnet didn't attract', saying it *in sentences* so *we get used to our proper scientific language.* In the final section, the children are cued into what the teacher wishes them to talk about by her pointing to objects in turn. Again she asks them to *say it in sentences* so she can *make certain that*

you can talk like scientists. At each stage the teacher gives a clear model of how she would like the children to answer, and what to say. In the first part she gives them an oral model, *magnets attract,* but also foregrounds the fact that she is talking about wording: *what we say is...*(1). In the second part she writes *attract* and *didn't attract* on the board which the children are able to refer to while speaking. At the beginning of the third part she gives them a further model: *the magnet attracted the nail . the magnet didn't attract the plastic top* (67).

The teacher appears to have two other linguistic focuses, the use of the past tense *attracted* and the structure *the magnet attracted X.* Early in the interaction she models *the magnet attracted,* placing a stress on the past tense morpheme, and commenting: *this is yesterday* (3), thus again drawing the students' attention to the significance of the tense. Most children are able to answer appropriately, but where individual children have difficulty the teacher provides further support, and the text is thus a good example of the differential nature of scaffolding. Three examples, with Francis, Gina and Francois, are considered here.

Francis

	FRANCIS	TEACHER
14	F. the magnet attracts to	
15		careful this is what we did yesterday
16	F. the magnet attract.ed attracted to the other magnets	
17		the magnet attract'ed . other magnets/ we don't need to sat the 'to' . so tell me again Francis
18	F. the magnet attracted the other magnets	

The teacher reminds Francis of the need for the past tense but does not provide the word, instead simply reminding him that this happened yesterday (see the section *Reminding and Handing Over* in Chapter 5). As pointed out in Chapter 2, SLA theory suggests the importance of 'noticing' a new linguistic item, and here the scaffold provided by the teacher supports Francis in this process. Recalling the form itself presumably requires a greater cognitive effort on Francis' part than simply repeating the word as given by the teacher (see for example Chapter 2 and the discussion of self-repair, Lyster and Ranta, 1997; Allwright and Bailey 1991). Francis hesitates but produces the past tense correctly, but he also makes an error in the grammatical structure itself. This time the teacher uses both a metalinguistic explanation — *we don't need the 'to'* — and models the correct form. Francis then gives the response the teacher wants.

Gina

Here the teacher again uses a *Reminding and Handing Over* strategy to help the learner 'notice' and self repair what she has said.

	GINA	TEACHER
54	the magnet doesn't stick onto the cork	
55		remember we're scientists now Gina .
56	em. ah! the magnet attracts	

Francois

Francois is a student on a special education program who is also an ESL learner.

	FRANCOIS	TEACHER
20	the magnet attract.ed to the em that thing that has em ***	
21		these are the things that we had (*pointing to materials*) . . what are you thinking of?
	Fr. points	
22	V: paper clip	

Many of Francois' interactions with the teacher are quite extended as she frequently spends time 'probing' what he says in order to help him express it more appropriately. Often he does not know words in English which are usually known by the other children. The teacher's response to this is to allow him to point at the object and for another child to prompt him. She spends several turns at this point discussing the fact that there were two types of paper clips and both were magnetic (23 - 32). Having established which one Francois is talking about, and providing a language model for talking about it, she returns to Francois.

	FRANCOIS	TEACHER
33		so Francois can you tell me/ the magnet attracted. . ?
34	the magnet attracted to the paper clip	
35		the magnet attracted the plastic coated . we don't need to say the 'to'/ the magnet attracted . the plastic coated paper clip/ you tell me
36	the magnet attracted . to the plastic . covered paper clip	

37		let's try it once more Francois . . Francois you don't need to say the 'to'/ listen to me/ the magnet attracted . . the plastic coated/ plastic covered paper clip
38	the magnet attracted . . /magnet . . the . magnet . . the plastic paper clip	

It is worth noting that the teacher scaffolds for Francois more strongly than she has for other children, and models for him the beginning of the clause (33). Francois makes the same mistake as Francis in the grammatical structure (a difficulty shared by several children throughout the unit) and the teacher again uses a metalinguistic explanation and a model. The slight hesitation after *attracted* (35) might be expected to draw the child's attention to this as the 'critical' point at which to listen. Francois does not produce a correct form on the second attempt (36) and the teacher repeats both the explanation and the model again, this time with a longer pause after *attract*. This time Francois is almost able to produce the response alone. What is interesting however is that later he twice more bids to respond along with the other children, and in both cases produces the target form successfully (60 and 78). The second bid contains a high degree of self correction *attach/ attached/ attracted,* suggesting that Francois has begun to internalise the new form at this point. On both occasions the teacher evaluates the response positively before he has finished the turn and again as he completes it, thus supporting the attempt as well as acknowledging the content of his response.

The interaction is thus characterised by its quality of contingency, defined earlier as the way that teachers pace the amount of help on the basis of moment-to moment understanding, and by the differential nature of the scaffolding provided for different learners. Mediation, therefore, must be seen as fluid and dynamic, becoming more necessary not only at certain *points* in the teaching/learning cycle, but also playing a more important part with certain *learners.*

Text 6.19
Classroom 1: Episode 12
Is there a clue in this word somewhere?

Context

Here the teacher focuses on the students' development of aspects of the scientific register, first on the new lexical item *non-magnetic* ; and second on the use of complete clauses to express the students' earlier findings. Again the text is lengthy to illustrate both the building up and the withering away of the scaffolding.

	STUDENTS	TEACHER
1		and we call this . . . and we call this/ excuse me . . non magnetic/non magnetic/ what could that mean/ good Stacey
2	S: Miss I know what it is	
3		oh good I'm glad you raised your hand that's very good Stace . . . non magnetic/Colin?
4		
5	C: it doesn't stick with a magnet	
6		good . . can anybody tell me this is just what you hear . . . I'll write it on the board and this might help you and I'll put it. (*writes non magnetic on the board*) . . how did you know that Colin, that it means that it doesn't . . that the magnet doesn't stick to it?
7	C: Miss it's	
8		is there a clue in this word somewhere?
9	Ss(*several*) yes yes	
10		what's the clue Colin?
11	C: non	
12		good boy . . non/ this (*indicating non on board*) means what Belinda?
13	B: no	
14		no/ good . . . so if we say non magnetic it means no . . . did you have another Jennifer that you know . . a non word? excuse me come over here please (*to student talking*) sorry Jen
15	J (*responding to previous question*): not magnetic	
16		does anybody know any other non words? Lindsay May?
17	L: non-fiction	
18		non-fiction good what does that mean?
19	L: it's not fiction	
20		that it's not fiction, do you know some other non words
21	A: non no to- toxics	
22		good for you Amanda non-toxic does anyone know what that one means? good Amanda/ good ears
23	A: it's not toxic	
24		yes but what does toxic mean?
25	A: it means like its *****	
26		you're close/ it usually talks about the environment . . Angie?
27	An: em like if if if it's *****	

28		no/ non-toxic means not poisonous/ when we say something's. . . so that's good. . non . . so whenever we see this it means no . . do you have some other non words Mario . . what?
29	M: non-smoking	
30		non-smoking good/ I like to always sit in the non-smoking section of a restaurant
31	F: and Miss sometimes I see it on crayons em toys	
32		and what and what has that to do with non
33	F: toxic	
34	S1: non-toxic	
35		oh non-toxic on the crayons, you know why that is because little children what do they sometimes do. . . ?
36	F: eat them	
37		yes so it's good to be non-toxic/ yes Viv
38	V: non em breakable	
39	non-magnetic	but we usually say unbreakable but that was good so . . non magnetic/ so we're going to learn to talk like 'scientists . . this is . aluminium (*holds up aluminium*) it is . non magnetic *(holds up cork)*
40	Ss (*several*): non-magnetic	
41		em raise your hand . . . George cork
42	G: I think it's ***	
43		but it's?
44	G: non-magnetic	
45		non-magnetic good . . excuse me Francois we have a rule . . . Bernadette
46	B: paper clip	
47		can I have a sentence, Bernadette
48	B: the paper clip is magnetic	
49		do you have any idea what what it could be made of . . . Stacy
50	S: steel/ like	
51		probably is a type of steel Stace very good the steel is magnetic . . . the paper clip is magnetic . . . Francois
52	Fr: the blue pla . . paper clip is magnetic	
53		good what's the difference here? there's something else different/ we've talked about it Frances

54		
55	F: the blue one has got steel inside it and the outside is plastic	
56	S: and the other one is just steel	
57		good so this is plastic coated . . the plastic coated paper clip is?
58	F: magnetic	
59		which is . . is it this . . do do you you remember? so can you give me a sentence? Francois?
60	Fr: the . . . . . the	
61		plastic
62	F: plastic paper p	
63		should have a video*(aside to observer, indicating the difficulty Francois is having, evident by his facial expression)*
64	F: plastic	
65		you're really trying hard I can tell you know what to say . . . Hannah can you help him out with it?
66	H: the plastic coated . paper . clip is magnetic	
67		everybody that's a hard one . . listen to me . . the plastic coated paper clip is magnetic let's try it
68	Whole class: the plastic coated paperclip is magnetic	
69		*(holds up silver paper clip)*
70	Whole class: the silver paperclip is magnetic	
71		OK good that was good *(indicates plastic lid)*
72	S1: Miss	raise your hand . . raise your hand/ Amanda
73		
74	A: the lid is non magnetic	
75		good/ everybody
76	Whole class: the lid is non magnetic	
77		ah good *(holds up gold coloured screw)*
78	Fr: Miss I/ I/ I	
79		Francois I really want you to talk . . . but you need to raise your hand
80	Fr: the golden screw is non magnetic	
81		yes . . now I have something . . . I have something to . . .
82	S4: loud Miss	*(aeroplane goes overhead)*

83	S5: Miss it's plated	(*holding up screw*) I went home and talked to my husband the other night because many of you were saying you thought that maybe . . . it was Bernadette and George . . . were saying you thought that this (*indicating the gold coloured screw*) was dipped in something to make it non- magnetic and my husband thinks you're right/ I'm not quite sure but he says this is what we call galvanised iron and when they put a galvanising coating on this
84	Ss (*several*) it won't stick	
85	S8: doesn't stick	
86		it won't . . . it becomes?
87	*Ss (many, loudly):* non-magnetic	
88		good it becomes non-magnetic so I think you and George were right Bernadette and I apologise and
89	S7: Miss we thought the same	
90		we have another screw here . . . alright the nail/ raise your hand
91	Ss (*several, bidding*) oh/oh	
92		Bernadette
93	B: the nail's magnetic	
94		the nail's magnetic so it's probably made of what?
95	B: steel	
96		steel right so I'll put that here/ everybody tell me about the golden screw
97	Ss (*several*): the golden screw	
98		everybody
99	Whole class: the golden screw is non magnetic	
100		come on Viv I'm giving you the chance to talk with everybody else . . . Vivien can you tell me about this one?
101	V: the screw . . . the golden screw is non magnet . . magnetic	
102		good and it helps if you do it with us Vivien because then I think it makes it a lot easier with that em . . Francois do you remember? (*indicating safety pin*)
103	Fr: em Miss . . babies use it	
104		yes I know
105	Fr: what do they call it?	
106		just help him out with the name of this Mario
106	M: safety pin	
108		Francois

109	Fr: the safety 'pin	
110		'safety pin (*indicating stress*)
111	Fr: the 'safety pin is magnetic	
112		sure is, good boy/ good you remembered that/ one cent . . Robert do you remember that?
113	R: Miss the one cent coin is non magnetic	
114		the thumb tack the famous thumb tack that some of you were working on/ Vivien
115	V: the thumb tack is magnetic	
116		alright so if these are the magnetic ones . . let's just try because everybody was having trouble with this . . . so let me start . . . the magnet attracts . . .
117	Ss (*many*): the thumb tack	
118	Ss (*most of class*): attract thumb tacks	right now we're going to talk about all thumb tacks so we're going to talk about magnets . . try it this way/ magnets attract thumb tacks let's try it
119	Whole class: magnets attract thumb tacks	
120		remember I'm not talking about just one I'm talking about 'all magnets I'm talking about 'all thumb tacks so let's try it again
121	Whole class: magnets attract thumb tacks	
122		the nail is magnetic . . . so you tell *me*
123	Whole class: the nail	magnets
124	Whole class: magnets attract the nail	
125	Ss (several): the nails	
126		again
127	Whole class: magnets attract nails	
128		the plastic coated paper clip is magnetic
129	Whole class: magnets attract the plastic coated paper clips	
130		that is hard/this paper clip (*demonstrating*) . . listen/ the steel paper clips are magnetic
131		
132	Whole class: magnets attract steel paper clips	
133		safety pins are magnetic
134	G: (*beginning a fraction ahead of others*)the magnet	careful careful George we're not talking about just this one

135	Whole class: magnets attract safety pins	magnets
136		alright tell me about this (*holding thumb tack*)
137	Whole class: magnets attract thumb tacks	

Discussion

Like the previous text, this text, taken in isolation, would seem to represent a very transmission-based pedagogical orientation on the part of the teacher. Yet this same teacher also frequently engages in dialogic interactions with students which would have little place in such a classroom. Again this example illustrates the importance of interpreting the text as part of the larger discourse.

At this point in the unit the students had had a number of concrete experiences with magnets, and had also taken part in reporting back to the class about their findings.

The purpose of the interaction is again made explicit to the students: *we're going to learn to talk like scientists* (39). Though the kind of talk which characterises the text, particularly from turn 40 onwards, might on the one hand be criticised as focusing on form rather than meaning, it should be noted that in order to respond to the teacher, students would need to draw on the knowledge which they themselves had earlier helped to construct. Like the previous text, its pedagogical nature can only be understood by being situated within the larger discourse context. Rather than reading this as an uncontextualised 'drill' it is more accurately characterised as a 'talking out' of the children's significant knowledge in ways which help them to better understand the concept and express it in more registrally appropriate ways.

The text falls broadly into three sections, which progressively move children closer to the aspects of the scientific register on which the teacher is focusing. In turns 1 - 40 the teacher introduces the term 'non-magnetic', drawing the students' attention in particular to the prefix 'non'. In turns 41 -117 the focus is on the use of 'magnetic' and 'non-magnetic' in complete clauses which thematise the materials the children have been working with, e.g. *the paper clip is non-magnetic* (48); *the lid is non magnetic* (76). In the final section (118 - 137) the teacher elicits from students generalised statements based on the information they have just given, and helps them to produce clauses which thematise 'magnets': *magnets attract thumb tacks (118).*

At the beginning of the first section (1) the teacher is referring to a group of things which the children had identified as not being attracted by magnets. She begins by

focusing students on a lexical item (*non-magnetic*), a key term in this unit of work. She repeats it twice and asks students what it could mean (1), writing the word on the board as she speaks. This increases its significance, while in addition, seeing the word might make it more likely that students will notice the prefix. In response to Colin's suggestion (5) the teacher asks how he knew (6), further scaffolding the response she is seeking by asking a second question, whether there is a 'clue' in the word (8). The students offer a number of examples and the teacher concludes this part of the text with summarising for students: *if we say non-magnetic it means no* (14). She continues with the same language focus by asking students for other 'non' words (15 - 39). Viv's suggestion (38), while not correct, is accepted by the teacher as "good" presumably since the student, though overgeneralising the rule in this case, has shown that she understands how the prefix can be transferred. At this point the teacher reminds the students that *we're going to learn to talk like scientists* (39) and the degree of shared understanding of the word they have just learned is evident in the chorus of *non-magnetic* (39) which overlaps with the teacher's use of the term. The students also chorus the term later and without hesitation when cued by the teacher in the following section (76, 87).

In the next section (41 -117), after making clear to the students that *we're going to learn to talk like scientists* (39), the teacher helps the children to recontextualise their findings through a mode shift towards more written-like discourse. The emphasis on the formal aspects of grammatical correctness which follows is therefore contextualised: grammatical accuracy serves a specific function. In addition, despite this focus on structure, the teacher still maintains a focus on the students' understanding of the science itself. Turns 50-58 for example, show the teacher checking on the students' understanding of the difference between two kinds of paper clips. Francois, the child mentioned above, again has great difficulty with producing the sentence that the teacher is asking for (60 -65); (the teacher, noting this, suggests in an aside to the researcher that a video is needed to capture the student's struggle). The teacher scaffolds for Francois in a number of ways. First she responds to the fact that he is *really trying hard* and that he *knows what to say* (65), thus foregrounding the interpersonal element of the interaction. To give Francois a chance to hear a model of what he is trying to say, she first asks another child to *help him out with it*, and then has the whole class repeat it again, at which time Francois joins in. Francois thus has two chances to hear the syntactic structure he is trying to produce (66, 68) and subsequently produces it by himself on two occasions (80, 111) (although these contain shorter nominal groups).

In the final section (118 - 137) the teacher helps the children with a further recontextualisation, this time by thematising magnets and therefore producing clauses which are generalisations. The children have some difficulty with this, sometimes failing to use a plural form (*magnets, nails*) to denote a generalisation. They had also, on a previous occasion, had difficulty with the use of *attract* (see text 6.19). Up to this point in the text the children have been referring to specific objects: *the thumb tack is magnetic* (115). Now the teacher makes explicit that she wants a different kind of response: *try it this way* (118) and gives an explanation of this: *I'm talking about all thumb tacks*. She also provides a model for the kind of response she wants: *magnets attract thumb tacks* (118), She has the whole class repeat this (119) and reminds them of the meaning of what they are saying: they are not just talking about one but all magnets (120). The children correctly thematise magnets in turn 121, but return to the earlier structure in turn 123. The teacher scaffolds the appropriate clause theme by speaking over the children, so that they 'shadow' her, which enables them to respond in the way she wants in turn 124. However this time they fail to include the plural morpheme and a few students then self correct (125). The teacher asks them to repeat the response again which this time they do using the model structure (127), repeating this in turns 129 and 132. In turn 134, George, beginning his response a fraction before the class, uses the singular form. Using the same technique as in turn 123, the teacher interrupts George, reminding him again that *we're not talking about just this one* (134), and provides the appropriate clause theme which the students then take up (135).

This highly structured text exemplifies further the importance of contingency in effective scaffolding. It highlights the need for a teacher to respond moment to moment to student needs, as she does in this text by 'overriding' inappropriate responses (123, 134) and providing models for individual children, like Francois. She also provides scaffolding by modelling each new structure several times, having students model it individually, using choral work so that those less fluent are able to shadow others more fluent, and helping student 'notice' the target form by her own use of metalinguistic talk.

PART 2: TEACHING AS MEDIATION: SOME IMPLICATIONS

The role of scaffolding

One of the realities of the classroom is that there exists a generally asymmetrical distribution of knowledge and power. The notion of teaching as mediation is able to address this reality. As the analyses of the texts in this chapter have shown, both teacher and student play active and interrelated roles in the learning process. It would seem then that the notion of teaching as mediation, and the closely related concept of scaffolding, recognise, in fact exploit, the asymmetry of the classroom, constructing *both* teacher *and* student as active participants in the learning process. As Edwards and Mercer suggest:

> If the educational process is not to be completely compromised by the asymmetry of teacher and learner, then we need to develop an understanding of the process which recognises and encourages that asymmetry in a manner that fosters rather than hinders learning.
> (Edwards and Mercer 1987, p. 201)

A view of teaching as mediation is also consistent with a view of minority learners which seeks to avoid 'blaming the victim'. Within a neo-Vygotskian framework, learners' achievements are at least in part determined by the strength of the cultural and linguistic frameworks (scaffolding) which support their learning (Mercer 1994), and thus the notion of teaching as mediation represents a major shift "away from the notion of learners who succeed or fail on their own resources, towards a view of learning as a situated, culturally contextualised activity" (Mercer 1994, p. 101). Students' individual successes or failures must in part depend on the quality of the contributions of others, not solely on their own innate cognitive abilities and learning strategies. In this chapter these contributions from others have been defined as scaffolding.

It is not the intention of this chapter to attempt to make claims about the nature of scaffolding in classrooms in general. Such claims could not of course be made on the basis of this sample of data. Rather, through the qualitative analysis of the texts, this chapter has attempted to discover within the discourse clues as to how scaffolding may be instantiated through interaction, in order to develop the notion of teaching as mediation.

More broadly, the analysis serves to illustrate how a theory of teaching and learning as social practice is played out with reference to how adults respond to children in authentic classroom contexts. In Wells' words, it shows how teachers:

> engage in the co-construction of meanings with individual learners in ways that are responsive both to the particular meanings that the learners are *currently* making and also to the larger vision of the meanings that they *will need to be able to make* in order to become productive and creative members of the wider culture.
> (Wells 1995, p. 239, my italics)

The analysis of the texts as the co-construction of meaning foregrounds a number of issues relevant both to the development of pedagogical theory and to classroom practice, and it is to these I now turn.

Mediation and socialisation

A theory of teaching as mediation offers a view of teaching which is an alternative to the debates around the binary notions of teacher-centred and learner-centred education. It is evident that despite the large amount of experiential group work and talk between children, the learning that occurred here was not simply a matter of individual 'discovery'; the discourse is not that of the so-called progressive classroom. Although each new piece of learning originated in student activity, their learning began but did not end at this point. The mediation of the teacher led to a recontextualisation of individual learnings within the production of a collaboratively built up, broader framework of meanings. Students were not left to create their own understandings: the final interpretation of what occurred, what was said and what was done, was ultimately controlled by the teacher, and congruent with her frame of reference and broader scientific principles. This supports the conclusions of others; see for example, Edwards and Furlong, 1978; Edwards and Mercer,1987; Stierer and Maybin, 1994; and Mercer, 1995. Stierer and Maybin write:

> The overriding impression from our studies is that classroom discourse functions to establish joint understandings between teacher and pupils, shared frames of reference and conception, in which the basic process . . . is one of introducing pupils into the conceptual world of the teacher and, through him or her, of the educational community. To the extent that the process of education can be observed taking place in the situated

> discourse of classrooms, it is on our evidence essentially a process of cognitive socialisation through language.
> (Stierer and Maybin 1994, p. 200)

Nevertheless, what was occurring in the classrooms was also not a matter of the simple transmission of a body of educational 'facts'. The introduction to the conceptual and linguistic world of the teacher came only after initial opportunities for children to develop understandings and to communicate together in familiar language, while they took part in the group experiments. Even though the ultimate definition of events was that of the teacher, the entry point for her contributions was always the current level of understanding of the children themselves. In addition, in the process of socialisation into the conceptual world of the teacher, students took part in discourse in which reciprocal listening played an important part. Children were listened to and their contributions taken seriously, and their contributions to the ongoing discourse acknowledged. As Lemke points out in writing about minority students, this is important if teachers are to avoid the inequity of regularly taking certain students' contributions more seriously than others (Lemke 1990a). In these classrooms, rarely were contributions passed over in favour of a specific answer; in Classroom 1 in particular, the teacher took considerable time to clarify with all students their intended meanings. In turn these are linked to the contributions of others and recontextualised; thus, at a theoretical level, the discourse operationalises the notion of the intertextuality of the classroom, and shows how this can be put to the service of learning. In both classrooms students were encouraged to articulate their thoughts and to listen to those of their peers. Teacher dominant forms of interaction, such as cued elicitation and IRF patterns, were not the only nor the dominant interactional patterns evident in the discourse as a whole. In the final *Reflection* stage of the teaching sequence, where students' developing understandings were recontextualised by the teacher in the process of the joint construction of common knowledge, the most frequent pattern of interaction was 'dialogic', as defined in Chapter 4. At these times there was some temporary transfer of expertise, the initiating moves of the teacher reflecting the fact that at such times, when students were reporting on findings, she was not the primary knower. Questions such as 'what have you found out?' locate the source of information with the student within that exchange, and in these classrooms frequently led to responses from students far longer than the one word or single clause response associated with heavily teacher-controlled discourse. To equate the kind of teacher-guidance which has been observed in the transcripts with a transmission-based teacher-controlled pedagogy is therefore to misrepresent

important qualitative aspects of the discourse and the student-situated starting point for learning.

Educational purposes and interaction types

A further conclusion that can be drawn from the transcripts is that scaffolded interactions are realised in a wide variety of ways and instantiated through a range of interactional structures. An inspection of the texts and their dominant interaction patterns would suggest that the teacher's choice of interactional pattern is closely related to the purpose of the scaffolding and the point at which it occurs in the learning sequence. The four types of interactions defined earlier (Chapter 4) appear to cluster around similar stages in the sequencing of activities, and serve fairly distinct pedagogical purposes. Thus contributions within interactions at the *Review and Orientation* stage, when students were asked to reflect on what they had learned, tended towards dialogic interaction. *Setting up the task* tended to produce teacher monologues or IRF/Cued Elicitation patterns. *Doing the task* involved participatory interaction and where the teacher joined the group, dialogic interactions. *Making sense of the task* used predominantly dialogic patterns to share and construct knowledge, but more teacher-controlled patterns, realised through IRF and cued elicitation, to remind children of what had been learned once that knowledge was common. Penny also used this more controlling discourse at the point when the language itself began to be more unfamiliar to children. If the final two stages of the teaching cycle (*Doing the task; Reflecting on the task*) are examined, there appears to be increasing teacher guidance in the discourse. In the group work children were free to develop their own understandings in familiar everyday language. When talking with the teacher in guided reporting episodes these ideas were put forward in students' initiating moves, but were also frequently recontextualised by the teacher, so that the joint discourse represented a shift towards broader scientific principles and aspects of the register. And with the increase in focus on 'talking like scientists', teacher talk incorporated stronger scaffolding as students were helped explicitly to use the new register.

The notion of what constitutes 'contingent' interactions has been discussed at several points in this study. It would seem in relation to the issues raised here, that one aspect of contingency is that it relates strongly to the pedagogical purpose and context of the particular interaction. A discussion of what constitutes contingent interaction must therefore take account of the fact that the teacher's role is likely to vary at different stages in the learning sequence and be realised in different types of interactional patterns at different points in the teaching cycle.

A further conclusion that can be drawn relates to the way in which classroom discourse is evaluated. To claim pedagogical 'effectiveness' in relation to a particular theory, or to make qualitative judgements that are valid or convincing, requires a reading of the discourse in the light of its pedagogical purpose and the social reality in which it is embedded. To critically examine classroom discourse we need to consider the degree to which particular kinds of interactions are justifiable in terms of their consequences for students and their learning, and their effect upon the teaching-learning environment. IRF and cued elicitation patterns, for example, may be appropriate when a task is being set up, so that teacher-expectations are made explicit and students are ultimately less dependent on the teacher while they are engaged in the task itself. Used in the early stages of developing understandings about a topic however, it may constrain student thinking and the development of principled understandings, and lead to merely ritualistic responses in interactions with the teacher.

The variation of interactional patterns that have been discussed here also relate to Lemke's argument for students to be able to 'extract' science meanings from the classroom dialogue, for example, to be able to write notes on the basis of triadic dialogue, or to be able to take a teacher's elaboration on a student's answer and restate it as a question. Questions are often only thematically complete with their answers, yet students must often construct thematic patterns on the basis of a sequence of questions and answers. To do this they need to be able to recognise the relationship of one move in a dialogue structure to another, for example how a teacher's cued elicitation question can be pieced together with its response (Lemke 1990a). In this study, the range of interactional patterns used offered students a number of different contexts through which they could begin to recognise the thematic relationships embedded in the discourse, and produce them in their own talk.

These observations clearly challenge pedagogical discourses which attempt to reduce pedagogy to simplistic notions of teacher-centredness or learner-centredness or describe classrooms as 'open' or 'closed'. A clearer understanding of such issues is also needed to rebut the views of exponents of back-to-basics theories and the politically loaded debates from the New Right about what constitutes effective teaching. This study supports Mercer's contention that the pedagogical principles around which diverse pedagogical discourses often compete, are not to be found in a 'theory of teaching' or a 'theory of learning' but rather within a theory of 'teaching-and-learning' (Mercer 1994). Conceptualising teaching as mediation offers a way of

encapsulating a unified teaching-learning theory, and represents a step towards the theorisation of pedagogy as social practice.

Rewriting history: mediation through recontextualisation

As has been shown, mediation in this data set largely involves the recontextualisation of knowledge. This section summarises how this process occurred. Typically, knowledge derived in one context (such as doing an experiment) is appropriated and recontextualised by the teacher in another context (such as teacher-guided reporting). These new meanings may in turn be recontextualised once more (as when the teacher uses these understandings to develop broader scientific principles). In Chapter 5, these shifts were considered linguistically in terms of the mode continuum. Here they are considered as they relate to the notion of teaching as mediation.

One interactional situation in which recontextualisation commonly occurs, is in an exchange between student and teacher in which the student's contribution is recast in more register appropriate ways. Usually, as shown in the previous chapter, this encapsulates a mode shift towards more written-like discourse, as the following example from text 6.2 illustrates:

Student: magnets can attach to other magnets strongly
Teacher: OK good/ magnets can attract to other magnets.

However there are other interactional contexts when the teacher's mediation incorporates a more radical shift, when she explicitly shifts the overall theme of the ongoing discourse away from the individual experiences of the students towards a discussion of theoretical principles. In these instances the teacher does not recontextualise individual students' contributions, but draws their attention to the common threads across a number of contributions in order to develop a theory, and in this process she leads students towards a more principled understanding of their earlier learning. Sometimes this is marked by the use of *tell*, for example, when talking with students about the results of their experiments, the teacher asks *what does that tell us?* that is, "what does that signify?"

This kind of recontextualisation, which shifts the learner towards principled understanding, is illustrated by the following examples. The students who had earlier coded their understandings as recounts, are now being asked to recontextualise them in terms of commonalities and principles. Students as actors

are 'decentred' and theoretic knowledge — coded as *the same results, something in common, the point of the experiment, general idea, two general ideas* — is foregrounded in the discourse:

> is that the same results as George got on his experiment? (6.13)
>
> if you'd listened carefully, you could find that there was something in common with the results of all three experiments (6.14).
>
> once again thinking as a scientist, what do you think the point of an experiment like that would be/ what were we trying to prove? (6.16)
>
> so I would like two ideas that we get from this, two general ideas, what we call generalisations (6.17)

However, recontextualisation does not always involve a mode or field shift towards more theoretic or written-like discourse. Sometimes, as shown in Chapter 5, the teacher's contribution shifts the discourse towards the more immediate and concrete, providing for students an exemplification of something less immediate in the discourse. This occurs, for example, when the teacher demonstrates something a student has said:

> R: how come the thumb tack attracted and the gold screw didn't/ we thought that they might be different metals (6.3)
>
> T: aah/see here's Rana's argument look . . (*picking up thumb tack and screw*) same colour . . the magnet didn't attract this (*demonstrating with screw*) but it did attract this (*demonstrating with thumb tack*) (6.12)

As noted in earlier discussion of the texts, the 'argument' is brought into the here-and-now and there is a corresponding change in the deictic orientation. The demonstration accompanied by the teacher talk becomes an instantiation of the general principle to which Rana is referring.

There is a similar shift away from the abstract when the teacher recontextualises meanings by using a projection of a quotation. In text 6.11 the student cites an imaginary, but likely, scenario, which the teacher recontextualises as direct speech, here a hypothetical verbal act. Thus 'meaning' is represented as 'wording', a

grammatically marked form and, as was pointed out earlier, a relatively unusual occurrence in the classroom where teachers more usually represent student wording as meaning. This point is explored more fully later.

J: Miss how about if . like . you have four people in your group . one wants to do something and another one want to do something else and they all want to do different things

T: they've all got different ideas? good/ good question/ does anyone have any suggestions for Julianne . if you got into your group and **everyone says "well this is idea"/ "this is my idea"/ "this is my idea"/ "this is my idea"** and no one wants to . . move from their idea (6.9)

Similarly in this text, from 6.11, the student's thought (meaning), is recontextualised as a verbal act (wording):

B: we/ we tried to put three magnets together . . to hold the gold nail . . even though we had three magnets . . it wouldn't stick

T: so . . . she put three magnets together . . . because she was concerned about that gold nail . . . and she said/ **she thought "well . . maybe one magnet wasn't strong enough"**/ is that what you were thinking?

Although in this data set, interactions between teacher and students are the most usual way for information to be recontextualised, another way that this occurs is through the use of parallel semiotic systems in interplay with the discourse, so that several meaning systems are built up simultaneously. In the texts below these systems are represented by the diagrams on the board. In text 6.6 the knowledge which is being constructed through the discourse is mediated through the use of a bar graph:

T: (*pointing to each axis in turn graph on board*): this one is the vertical and this one is the .?

Ss: horizontal

T: horizontal

In text 6.17 it is mediated through the use of a matrix:

T: if I put the pole of the first magnet (*pointing to magnet 1 on matrix*) . . the north pole . . to the north pole of the second magnet (*pointing to magnet 2 on matrix*) what will happen?

S: they repel

In these texts, the information sources provide a visual context for students to interpret the discourse of the teacher, because of the opportunities for demonstration and modelling that they allow. However, non-linguistic semiotic systems may, in themselves, be no more transparent to learners than language itself, since they must first learn to 'read' them, and to recognise the recontextualised information they display. The teacher implicitly acknowledges this when she suggests to students that the graph *must tell you something . . . there must be some information that you can get from the way you recorded*. These parallel semiotic systems thus play a dual role in the recontextualisation of meanings. They provide the necessary referent for the context-embedded discourse, and hence are integral to the meanings being built up, but at the same time they represent recoded information, which, in this case, has as its source the science activities carried out by the children. In this data the use of such additional semiotic systems is limited. Further investigation of the use in the classroom of written texts, video, audiotapes, CD ROMs or Internet, in their interplay with spoken discourse, would provide a valuable perspective on the nature of recontextualisation in multi-modal settings, and contribute to a broader understanding of the notion of comprehensible input.

These examples have summarised some of the contexts in which recontextualisation occurs. As discussed earlier, Edwards and Mercer (1987) suggest that teachers often 'rewrite history' by a kind of editing process: they highlight certain events and understandings, those they see as educationally significant; and down-play others, those they see as irrelevant or confusing. Such 'rewriting', involving as it does the removal of irrelevant content, the modelling of new and subject specific language, and the appropriation of student-initiated ideas, is of particular importance for the kind of explicit teaching that supports students learning in their second language.

In the data examined here, one pervasive linguistic feature in the process of recontextualisation is the teacher's use of the verbal process *say* . The next section explores this further.

Who is saying what?

In quoting, and according to Halliday, a projected clause stands for wording, whereas in reported speech it stands for meaning (Halliday 1985b). Unlike quotation, reported speech makes no claims about holding to the actual words of the speaker[7]. When a verbal act is reported, it is reported as meaning, which may or may not concur with the speaker's view of what they said, (see for example Hill and Irvine's work (1992) on evidence in oral discourse). As later discussion points out, teachers make particular use of the licence this offers!

In the data, *say* is at times used in contexts where the focus is on language per se, as in this example where the teacher is eliciting ways of wording a prediction:

> Diana might say "I think that the north pole is going to attract the most clips" . . . how else could you make the language of prediction/ what could you say . . . we could use "I think"/ what else could you say . . (6.7)

In the context of recontextualisation this is not the sense with which I am concerned here. Rather, I will look at those instances where *say* projects reported wordings as meanings. This usage often occurs when the teacher is clarifying what an individual student has just said:

> S: em the two poles they like to like er stick to some things * or otherwise they will pull away/ stick to something something that ***
>
> T: so you're saying that you've got a pole on each end. . and one pole will only stick to some things (6.14)

It is also used very frequently to report to the rest of the class about what a student has said earlier. This is, as has been shown, one way in which teachers appropriate students' ideas into the discourse and mark them as significant:

> she said 'even 'though she put three magnets together it 'still wouldn't hold that nail (6.11)

---

[7] Of course, wordings do not necessarily concur with what a speaker said either; they only claim to do so.

this is exactly what you were saying
(*to students who had earlier recounted the results of their own experiments, after the class had reached the generalisation that like poles repel*) (6.14)

In these situations the reported projection encapsulates the teacher's version of events, while the locutor remains the student. For second language learners, this process means that they are able to participate in the discourse on their own terms, using the language they are familiar with, and having their contributions treated seriously, while at the same time they are given access, through the teacher's recontextualisation, to more registrally appropriate language. These recontextualised ideas, when returned to the discourse, often continue to be attributed to the original speaker, even though the version is now reworked and reformulated: *Amanda was saying she was trying to show the power of magnets.*

On occasions a contribution is attributed to a speaker, which bares minimal resemblance to what had actually been said; see for example text 6.2, 16 -23, and the series of exchanges leading to: *that's what Charbel said*. Such are the shared understandings of students and teacher about how classroom discourse works, and the status of both the official discourse and the reporter, that the 'accuracy' of the reporting goes unchallenged. Much classroom discourse appears to rest on a benevolent conspiracy between teacher and students which maintains that while it is students who do the 'saying', it is the teacher who knows the intended meaning of their verbal acts.

This meaning differential is illustrated by Figure 6. 5 (based on text 6.2 where the teacher is recapping with the students the shared knowledge of the class). The jointly produced discourse between students and teacher has here been pulled apart so that each set of contributions can be read as a separate version of events. While this layout works against the representation of discourse as a joint production, it does serve to represent how teacher talk selectively appropriates and expands on student talk and thus how student contributions and the recontextualised teacher version each produce a different set of meanings.

Fig 6.5 Two versions of events

Note: The version has been edited to remove hesitations, false starts and unfinished clauses, and conventional punctuation used, since the focus here is on the propositional content of the discourse. Where the teacher used a cued elicitation in the original, the question has been replaced with a statement, since the teacher is the initiator of the utterance and the proposition in this case comes from her. The word originally provided by the students is then italicised. See text 6.2: 2 - 23 for the original transcript.

Students' versions of events	Teacher's version of events
The north pole and the south pole attract to each other.	There are two parts of the magnet, the north pole and the south pole. *The north and the south* attract each other.
Most north and north don't attract to each other	We learned opposite poles attract. The same poles, north and north and south and south, don't attract to each other, they *repel*.
and all magnets are strong. All metal twisties are magnetic. Magnets can attach to other magnets strongly.	Magnets can attract to other magnets.
Not all metal attracts to magnets.	Before we started we thought that metals attract to magnets; now we know it's not all metals, just some metals.

Examining the discourse in this way illustrates how the teacher's version, while clearly related to that of the students, contains somewhat different propositional content, uses different wordings and hence produces a different set of meanings, a process Lemke refers to as "retroactive contextualisation":

> Retroactive recontextualisation ... is of considerable importance to the theory of meaning. In essence it means that after an answer has already been given, which had one meaning in the context of the dialogue that preceded it, the teacher says something to alter the context and make it seem that the answer had quite a different (or additional) meaning.
> (Lemke 1990a, p. 103)

In the example above the teacher adds extra information about the parts of the magnet, introduces the item *opposite poles* as a lexical substitution for *north and south*, and summarises the students' contributions as *opposite poles attract . . . the same poles . . . repel*. She recodes *attach* as *attract* and *don't attract* as *repel*. She also marks what has been learned: *we learned that; before we thought . . . now we know.*

It could be speculated that the closeness of 'fit' between each set of contributions offers an insight into how far the students' zone of proximal development is informing the teacher's response. The notion of the ZPD and the importance of contingent responses would suggest that teacher talk should take student talk as its starting point but extend it beyond what students are capable of producing themselves. In many of the texts examined it appears that this is what occurs. The degree of difference between student and teacher talk can perhaps more generally illuminate the appropriacy of teacher responses in classroom discourse. Too close a match would suggest that students are not being provided with a context in which learning will occur, too great a difference may lead to students failing to understand the teacher's discourse (see Lemke's thematic analysis of science discourse in the classroom, in which he demonstrates the outcomes of too great a gap between the thematics of teacher and student: Lemke 1990a, p.28-48).

Examining the transcript in this way also demonstrates the control that teachers exert over what counts as knowledge, and how it gets constructed. The experiments in which the students took part did not intrinsically 'have' meaning. Meanings had to be made for them, in this case by teacher and student, yet always, as we have seen, these meanings are ultimately controlled by the teacher. This thesis acknowledges and argues that the process of schooling is in part the socialisation of students into subject specific discourse, and that for minority students in particular this process is essential if they are to develop the skills to participate in the broader society. Delpit's view that teachers must coach the voices of their students "to produce notes that will be heard clearly in the larger society" (Delpit 1988, p. 285) is one with which this thesis concurs. And as has been shown through the examination of the discourse in this chapter, the kind of scaffolding provided by teachers as they socialise children into school learning offers great potential to the English language development of ESL students. Nevertheless the analysis also signals a warning. In the construction of classroom discourse, there is the potential for these same students' voices, in the process of recontextualisation, to become pale reflections of their original ideas and thoughts. While this may be relatively unproblematic in discourse about magnetism, it is not so in those areas of science which have ethical and social implications. The production of discourse situated within more complex science, and within the social sciences, such as history, human society and environment, or geography, indeed in any curriculum subject, may result in even greater differences between the versions of events and world views of minority students and their teachers. As Lemke argues, "it is the sense we make of what we see that matters ... [and] that meaning is always an interpretation of what

we perceive" (Lemke 1990a, p. 147). Yet, as we have seen, it is usually the teacher's view, reflecting the 'official' and mainstream curriculum, that represents this interpretation. Cummins (1988) argues that students' identities are constructed in the school context through their interactions with teachers, and Philips (1972), Heath (1983) and others have demonstrated the sometimes negative effects of interactions between 'mainstream' teachers and minority students on students' educational progress. While acknowledging the nature of classroom discourse as a process of socialisation and recognising its potential for language development, then, educators must remain alert to its potential for the silencing of some voices. Lemke's comments about science teaching are applicable to school learning in general:

> Teachers should show respect for commonsense views and alternative religious or cultural views, while presenting the view of science and the reasons for that view ... science education only needs to ensure that [students] learn the view of science, not that they prefer it to all others, or give up any other view.
> (Lemke 1990a, p. 171)

CHAPTER 7

The Learners: Discourse Contexts For Second Language Learning

The focus [for SLA] should be ... on observing the construction of co-knowledge and how this construction process results in linguistic change among and within individuals during joint activity. In this way we can begin to answer the question of how negotiation arising from interaction impacts on L2 development.
(Donato 1994, p. 39)

INTRODUCTION

Chapters 5 and 6 examined the data from two theoretical perspectives. Drawing on systemic linguistics, Chapter 5 showed how the classroom discourse incorporated a series of mode shifts, and how in the process of jointly constructed meanings a more scientific register began to be developed through the ongoing discourse. Chapter 6 focused on the role of the teacher in this process, and showed how the role can be interpreted as one of mediation, with the teacher as active participant and guide within a pedagogy which avoids the reduction of teaching and learning simply to notions of teacher or learner centredness. The present chapter reexamines the discourse once more, this time from the perspective of the learner. It examines the data to explore how far the kind of pedagogical practices examined in Chapters 5 and 6, also provide enabling contexts for second language learning. If it can be shown that the classrooms do provide such contexts, then it can be argued that classrooms where teaching and learning practices represent an operationalisation of a functional view of language (Chapter 5) and neo-Vygotskian perspectives on learning (Chapter 6), also offer to minority learners an 'acquisition rich' second language learning environment. And hence for researchers, these views of language learning also offer a way of theorising an appropriate pedagogy for second language development. As Ellis points out, comparisons of a single teaching 'method' may not be the most appropriate means for investigating the effect that language teaching has on second language learning (Ellis 1994). What this chapter attempts to do instead is to examine particular teaching and learning events, as realised through interactions, in relation to theoretical insights about second language acquisition, derived from the SLA literature.

Part 1 of this chapter considers opportunities and contexts for second language learning, in relation to each of the four stages of the teaching cycle: *Review and orientation, Setting up the task, Doing the task* and *Making sense of the task.*

Part 2 considers how students themselves thought about their learning through an examination of what they wrote and said about the role of talk in their learning.

Part 3 explores key theoretical SLA notions such as 'comprehensible input', 'comprehensible output', 'negotiation' and 'noticing' from a linguistic perspective, in terms of some of the ways they are instantiated through the classroom discourse, and the situational contexts in which these instances occurred. Part 3 therefore attempts to flesh out aspects of SLA theory in terms of pedagogical practice.

PART 1: CONTEXTS FOR SECOND LANGUAGE DEVELOPMENT

Part 1 considers what opportunities for second language learning, are offered in relation to each of the four stages of the teaching cycle or macrogenre: *Review and orientation, Setting up the task, Doing the task* and *Making sense of the task.* It considers what evidence the data provide that the discourse at each of these stages constructs the kind of micro-contexts which are enabling of second language development. It poses the question: what language development opportunities are offered by the different types of interactions evident in these micro-contexts? In order to consider this, some of the transcripts from Chapters 5 and 6 will be re-examined along with additional texts from the four stages.

Review and orientation

Chapter 6 argued for the relevance of the *Review and orientation* stage for all students. Here its particular relevance for students who are not yet fluent in the language of the classroom is considered.

The following text (7.1), which appeared in Chapter 6, occurred at the beginning of a new lesson, prior to further experimental work.

Text 7.1

	STUDENTS	TEACHER
1		can you tell me . . anything . . anything at all. . think about it in your mind first/ take some thinking time. . . anything that we have learned about magnets so far . . . just have some thinking time . . . anything that you have learned about . magnets so far . . . . . think . . . . OK Janet
2	J: Miss . the north pole and the south pole attract to each other	
3		OK . . there are two parts of the magnet the north pole and the south pole . . which parts attract to each other?
4	J: Miss the north and the south	
5		OK so we learned last week didn't we/ that opposite . poles attract/ good/ Andre
6	A: most north and * em (don't) attract to each other =	

7		well done
8	A: = and	
9		sorry keep going
10	A: = and all magnets are strong. like.	
11		that the same poles/ north and north and south and south they don't attract to each other/ they?
12	S2: separate	
13	S3: repel (*several voices*)	
14	M: push	
15		repel/ well done

In the episode prior to that in which this text was produced, (Episode 25), which took place in the previous lesson, some children had made the following comments:

> if you put the south and north together then they will attach but if you put north and north together they will not attract
>
> the north pole and the south pole attract whereas the north pole and north pole repels
>
> the north pole and the south pole attract each other whereas the north pole and the other north pole repels

Despite the accuracy of the information at that time, and the adequacy of the way it is expressed, the teacher nevertheless begins the next lesson with the same information. The review is clearly needed: a reading of text 7.1 reveals that not all children have understood or are able to express the information. A review creates a kind of 'safety net' for students who need a second chance to access the information, among whom are likely to be those who are less fluent in English. It provides a second opportunity for them to gain access to information which may not previously have been fully comprehended: repetition is also of importance in itself in helping to make language comprehensible (Krashen 1981, 1989; Parker and Chaudron 1987; McGroarty 1993; Met 1994). The review, with repetition of information and language by both teacher and students, makes certain linguistic forms and language forms more salient because of the frequency with which they are used.

The *Review and orientation* also provides a context for interpreting new experience, and a context within which the language being used is to be understood. It "anchor[s] the new language in things that [teachers] have reason to believe the

students already know" (Wong-Fillmore 1985, p. 31). As Chapter 6 pointed out, helping students remember their learning situated what was to come in the context of previous learning, thus 'anchoring' the new language and learning in what is already familiar. In non-pedagogic discourse, the familiarity of interactants with the 'given' (the assumptions about what has been previously understood) is an inherent part of understanding the 'new' (the as yet unknown or new information)[1]; the given thus remains implicit, except when implicit assumptions begin to be questioned. In this pedagogic discourse, however, the Review Stage is a time when the given is explicitly articulated, rather than being taken for granted. It represents a 'curriculum space' for the given to be reinserted into the discourse, and, for a time, to be made explicit once more. What is going to be taken as assumed in the new episode is re-articulated; the given is held up for inspection. In terms of schema theory, new language is mapped onto this schema; for second language learners the activation of schema is an important aspect of comprehension (Wallace 1992).

Setting up the task

The importance of explicitness for children who are less familiar with the language and culture of the classroom has already been discussed (see Chapter 2 in relation to the work of Martin et al, Wong-Fillmore and Delpit). It has been argued that one of the roles of successful scaffolding is to set learners up for success, and that learners' self esteem is enhanced when they experience academic success. To be successful in the classroom however, children not only need to understand the nature of the task, that is, what they are supposed to do, but also their role as learners, that is, how to 'do school'.

In the text below, the teacher is explaining to students the procedure for an experiment the students are about to carry out in small groups. She is referring simultaneously to the concrete materials themselves and to the written instructions. To show how the teacher made what she was saying comprehensible, the transcript includes a commentary on what the teacher was doing and aspects of her verbal and gestural behaviour.

[1] For more detailed discussion of 'given' and 'new' see Halliday 1995 p.277; van lier 1996 p. 172

Text 7.2

TEACHER	COMMENTARY
place it like that sitting in there .	puts first magnet in cradle
OK/ it says *place another magnet on 'top of the cradled magnet*	reads slowly from card
so you've got one magnet in here .	points (*here*)
then you have to put another magnet. on top . . OK? of the cradled magnet	holds second magnet above first
once again . . *observe what happens.. and record using words and diagrams..*	reads slowly from card
OK then it asks you . to repeat. . *'alter'nating the poles/*	*alternating* enunciated slowly and with stress, preceded by a pause
what does that word . 'alternating mean? anyone know what alternate means? just simply. 'changing . .	defines unfamiliar (formal) lexical item using familiar (everyday) one (*alternate/change*) stress on *changing* preceded by a pause
OK so if you put it. facing you've got one magnet in there	pointing (*there*)
and you put it in. facing one way. change the poles around .. change it to the other side .	uses familiar term (*change*) holds second magnet above first and turns it around
alternate the poles . and what happens now . .	models new lexical item (*alternate*)
so you're trying it each way	summarises process in familiar language: *trying it each way*
. . once again each card will tell you how you have to record . by writing or drawing . right that's just a quick explanation . . . but as I said the explanations are on each card so it might be a nice idea as a group. to read through this. the instructions . . together. make sure everyone understands what's going on . and then . . start your experiment .	gives strategy for solving possible later difficulties (*the card will tell you*)

Part of this text was examined in Chapter 5 in order to examine the way in which mode shifts were realised in the discourse. The mode shifts here are clearly related to how the teacher attempted to make written language comprehensible. She demonstrates each stage of the process, while reading from the written instructions and using familiar terms to explain an unknown lexical item. The movement back and forth between the written language of the instructions (*alternate*), the 'everyday' language which is familiar to children (*change*), and the context-embedded language used in the teacher's demonstrations (*in there, here*), provides multiple opportunities for the learner to interpret what they hear. The text exemplifies the kind of discourse which Parker and Chaudron argue to be most helpful for comprehension, that is, talk which incorporates 'elaborative modifications' which contribute to

redundancy, or which make the thematic structure explicit (Parker and Chaudron 1987). It has also been suggested that redundancy is only helpful when essential information is made clear — increasing the amount of irrelevant detail does not assist comprehension and may hinder it (Derwing 1989). In this text, the teacher includes only essential information, and the redundancy that occurs is focused only on what it is critical for the students to know in order to carry out the task. This text offers a good example of how mode shifting can help make input comprehensible to second language learners.

The quality of the teacher's voice also adds to the meaning potential, marking what the students are to see as significant. She reads slowly and clearly, holding up the card so that students can read with her. Key words receive marked stress (*'change, 'alter'nate*) and there is also use of the 'pregnant pause', the pause, often less than a second but clearly perceptible, that teachers use immediately before a word or phrase of some significance (*it asks you . to repeat . .'alter'nating the poles).* Such features make these key words salient and, we can assume, bring them to the notice of learners.

In terms of second language pedagogy, as discussed in Chapter 5, this text illustrates the complexity of what it means to make language 'comprehensible'. What occurs here cannot be described simply in terms of simplifying or rephrasing, and the teacher is doing more than using demonstration. Certainly all these strategies are used, but it is the interrelationship between them and their integration with both the material context and the written instructions, through which meaning is made comprehensible. As earlier discussion also suggested, meaning cannot be adequately understood in terms of a single semiotic system, nor is it created through language alone: it is 'multi-modal'[2]. Thus making input comprehensible is not simply a linguistic process, but a dynamic process involving the coordination of a range of semiotic systems.[3] Here the information being given to the students is presented in a variety of ways, and the message redundancy which results gives students, in Wong Fillmore's terms, "multiple access" to understanding the instructions. It is this multiple access, drawing on extra-linguistic semiotic systems and modes of language existing within the *same* situational context, that provides comprehensible input to second language learners. At the same time, learners are not restricted in the models of language they are hearing. While simplification would likewise have provided learners with comprehensible input, it would also have restricted them in gaining access to models of alternative registers (realised

2 See, for example, Lemke (1998)
3 For a similar example, see text 6.6.

here by the written instructions). As pointed out in Chapter 5, this text exemplifies a much richer and more dynamic interpretation of 'comprehensible input' than its exemplification through notions of simplification or modification would suggest.

In the following text the teacher gives instructions to the children about a task they are about to do, which involves using a range of magnetic and non-magnetic objects and a bar magnet. Though no specific instructions are given as to how they use the equipment, the children are told that they are to record and later report on anything they find out.

Text 7.3

	STUDENTS	TEACHER
1		now . what we're going to do . . is . I have six groups of things up here . and we're going to get into groups . and you're going to get . . . Stacy/ we're going to get into groups and you may have . there are two different types of magnets here/ you may take one . of each . and they/you have quite a few different materials here and I want you just /I'm not even going to tell you what to do with them . . I want you to do with it . . as you like . . . . but I want you to try to find 'out something from all of this . . so you need to record this in some way/ you need to choose a recorder so that your group records what you find . . so that you have something to report back to us/ now tomorrow afternoon we're going to 'tell each 'other what we found in our groups . so today we're just going to spend time . in your groups . . working with the magnets and working with these material but I want . some kind of recording . yes Francis what?
2	F: could you pick the groups?	
3	(*no response from Viv*)	I'm going to pick the groups yes . alright would you tell me Vivien what we're going to do? . . . come on Viv . said it twice . . . Moya will you help Viv?
4	M: we are going to get . . one . of two kind of magnets . and . and . we are going to go to . one of the group . on the blackboard . . shelf and and . . do what we like with the magnet?	

5		yes but there's something very/ something else that's very important . what else 'must you do? Philip? what else 'must you do/ you can't just . do whatever you / you 'can do whatever you like but you also 'have to do something/ Belinda?
6	B: you have to record what you did	
7		you have to re'cord . . what you found . and what are we going to do tomorrow Philip?
8	P: em we're going to/ we're going to going to	
9		what are we going to do tomorrow?
10	P: we're going to tell . what we found out	
11		good boy/ you were listening/ that's good Philip . . you're going to tell what you found out . . not all groups will record things the same way and they may found/ may find different things

This text exemplifies a strategy which both teachers used regularly. After being given instructions about what was to be done next, students were asked to retell the instructions. Chapter 6 discussed how the teacher scaffolded this retelling through each of her questions: *what are we going to do? what else are we going to do? what are we going to do tomorrow?* By responding to these questions the students are led to recall and retell the key components of the task: use the magnets, record what they find and report to other students. In the school context young second language learners frequently have difficulty in comprehending or recalling a string of instructions (Lock 1983), (a problem not restricted to these students however!). The retelling strategy used by the teacher offers students an additional opportunity to hear what the task is about. Using guiding questions puts responsibility back onto the children, not only to try to remember what they have been asked to do, but also to articulate it themselves, thereby creating an additional opportunity for comprehensible output, and also stretching the demands being made on the learners. Bruner (1986) has argued for the importance of reflection in learning; equally we can argue for the role of reflection in planning what will be done. For minority learners, opportunities for such reflection, in this case provided through the retelling of the teacher's instructions, appears likely to increase the comprehensibility of the language, and hence increase the degree to which the task is made explicit. This text is perhaps an example of what van Lier refers to as "proleptic discourse". Proleptic discourse "is aware of gaps in understanding and invites the less-competent into sharing with the more-competent"; the hearer "is

given clues for the enlargment of common ground". A speaker or writer who uses ellipsis, on the other hand, leaves the listener to provide information which is considered redundant by the speaker and hence left out, and "does not explicitly check or facilitate the listener's interpretive processes, or invite the listener into a shared intersubjective space" (van Lier 1996, p. 182).

This text is an example of what many teachers do intuitively, which is to exploit incidental opportunities for language learning. While clarifying the instructions could have been achieved by the teacher retelling them herself, it would also have reduced the potential language learning opportunities by creating a listening-only context. The hand-over of responsibility to the students for reviewing the demands of the task is an example of how a common classroom situation can be exploited for language learning purposes.

Doing the Task: working with peers

This section considers the part played by group work in supporting second language development.

Doing the experiment

Mohan (1986) argues that a starting point for context-independent discourse is talk which occurs in the immediate environment of the learner. The experimental tasks which children carried out in small groups instantiate the here-and-now principle, which, as already discussed, facilitates comprehension and is enabling of language learning. One of its major functions was to familiarise the children with the subject matter of the later input; familiarity with content makes that input more comprehensible (Krashen 1989). In the experiential group work, the immediate situational context, including the science materials and the children's reactions and gestures, provide a visual context within which language can be interpreted. As has been shown, the knowledge which begins to be built up at this point later becomes the shared knowledge of the group and then of the class. The group work is significant therefore both in making science 'content' accessible to students less fluent in the academic registers of English, and in creating intersubjectivity between students and teacher.

In text 7.4, the students are carrying out the experiment on repulsion which was the focus of the group talk in the series of episodes described in Chapter 5.

Text 7.4

1	Patrick	turns around
2	Joanna	look at this
3	Peter	let it go
4	Hannah	try . . . the other way
5	Joanna	what do we have to do . . . it turns around
6	Patrick	what turns around?
7	Peter	the thing . . .
8	Hannah	turn it
9	Patrick	can I try . . . can I try?
10	Joanna	put it like this
11	Hannah	have you had a go?
12	Peter	put it like this
13	Hannah	put it . . .
14	Hannah	cos this one can't come out
15	Peter	yeah I know
16	Hannah	I just want to see one thing . . . I just want to see one thing
17	Patrick	try . . . one way
18	Hannah	try . . . the other way
19	Patrick	like that
20	Hannah	north pole facing down
21	Joanna	we tried that . . .
22	Peter	oh
23	Hannah	it stays up
24	Patrick	magic (*laughter*)
25	Peter	let's show the others
26	Joanna	mad
27	Peter	I'll put north pole facing north pole . . . see what happens
28	Patrick	that's what we just did
29	Peter	yeah like this . . . look
30	Patrick	do it again . . . so it . . .
31	Joanna	I love that
32	Hannah	it turns around
33	Joanna	but I didn't know . . . didn't know . . . that it bounces up and down (*pushing top magnet with finger*)
34	Patrick	funny . . . it bounces up and down . . . bouncey bouncey
35	Hannah	can I try that? . . . I know why . . . I know why . . . that's like . . . because the north pole is over this side and that north pole's there . . . so they don't stick together
36	Peter	what like this? yeah
37	Hannah	yeah see because the north pole on this side . . . but . . . turn it on the other . . . . this side like that . . turn it that way . . . yeah turn it that way . . . yeah
38	Peter	and it will stick
39	Hannah	and it will stick because . . . look . . . the north pole's on that side because
40	Peter	the north pole's on that side
41	Patrick	ready set go ready set go
42	Joanna	the north pole . . . and the north pole . . . going to touch

Turns 1-23 in this text exemplify what Martin refers to as 'language in action'. The talk is highly context-embedded and contains a number of exophoric references (2, 3, 4, 5, 10, 12, 14, 19, 23) the referents for which are found within the immediate situational context. For second language learners this is a situation which facilitates not only their comprehension but also their participation. Far fewer linguistic resources are needed in such a context, with reliance on gesture and the meaning-making potential of the immediate context compensating in part for lack of linguistic resources. (It is significant that in the reporting session, a major difficulty for the children was to construct discourse where referents needed to be made explicit). It has been pointed out earlier that action exchanges are an earlier development than information exchanges in first language development, with interpersonal elements of language being foregrounded (Halliday 1993). If the same principle can be applied to second language learning, then it would seem that contexts such as this are an important part of classroom discourse: lower level learners can join in by taking part in action before they are expected to join in by offering information. All four children contributed to this section of the discourse.

Turns 35 - 42 are more reflective, with an increase in information exchanges. The transcripts show clearly the increase in length of individual utterances. At this point, individual utterances become more explicit, and this occurs as the students begin to formulate explanations for what they see (note the logical connectives *so, because*). As earlier discussion pointed put (see Chapter 5), there is within these texts evidence of children's learning of science: the beginnings of an understanding of why the magnets are behaving as they are, and attempts to hypothesise about the causal relations involved. This movement towards 'scientific' thinking and the kind of exploratory talk which occurs here is clearly educationally desirable, especially if we consider the Vygotskian notion of inner thought: exploratory talk could be expected to lead to higher levels of cognition than action oriented talk. We might question, then, why the discourse changes at this point, and why it does not simply continue in the action-oriented way of turns 1- 23. The question may relate to Pica's assertion (see Chapter 2) that the outcome of students working together is dependent on the nature of the classroom activity; desirable outcomes are not guaranteed simply by having students work in groups. The task must require, not simply invite, talk. If we examine the way that the teacher set up the task, some insight can be gained into why the discourse progressed as it did. The teacher had said that children were to *try to explain what you see,* and there was also an expectation that they would report to the rest of the class about this. There was therefore a need, not simply an invitation, to propose an explanation. The cognitive challenge inherent in the teacher's instruction is particularly important in a teaching

context where a teacher must balance the need for suitably high levels of cognitive learning with learners' relatively low levels of English, and where learning activities aimed at development of the second language must also be linked to cognitive growth. The instruction to students to explain what they saw extended the task from one where students simply carried out the task and talked as they did so, to one where they were challenged to reflect on and articulate what occurred. In terms of the intertextuality discussed in Chapter 5, this task is cataphoric in that it points forward to the talk which is to come later.

The change in discourse evident from turn 35 may also be related to the amount of time allowed for the task. Students appeared to need time to reach this point in their talk; it was not until they had all had an opportunity to 'do' (in fact to play with the experiment) that they began to 'reflect'. Too often perhaps learners are given insufficient time to reflect on what they have done, suggesting that even in teachers' minds the 'doing' of the task in science takes on greater importance than the subsequent interpretation of its significance.

Other group work tasks

As the episode summaries indicate, group work occurs in many contexts apart from the experimental work itself, and some of these are now considered.

Text 7.5

The following text occurred when a small group of students were preparing to report to the class about what had occurred in their experiment. In setting up this activity, the teacher had asked each group to first recall and recount together what they had done in their experiment, prior to reporting back to the class as a whole:

> **Teacher**
> instead of telling me what happened straightaway I'm going to ask you to go back into those groups . . . . . and I want you in your group to retell or recount what you did . . . what the activity involved and then what the results were/I want you to get that straight in your groups because then I'm going to ask certain people to come out the front and tell the rest of us what you did and what the results were/ because we all did different experiments we don't know the results/ we only know the results of one experiment/ so thelanguage you choose is going to be very clear and precise because people don't know what was going on/ I'm going to ask you to report back to the group without using any of the equipment.

Text 7.5 (discussed also in Chapter 5) occurred as the children produced this joint retelling.

1	Emily	we have to talk about what we did last time and what were the results . . . . .
2	Milad	we got em . . we got a. thing like . . this . . pu- we got paddle pop sticks and we got
3	Maroun	we put them in a pot
4	Milad	and have to try and put
5	Julianne	wasn't in a pot/ it's like a foam . . . =
6	Milad	a foam
7	Emily	= a block of foam
8	Julianne	and we put it
9	Emily	we put paddle pops around it . the foam/ and then we put the magnet in it
10	Julianne	and then we got
11	Emily	and then we got another magnet and put it on top. and it wasn't touching the other magnet . . Maroun your go
12	Maroun	when we . . when we turned it the other way . . it didn't stick on because . . . because
13	Julianne	because?
14	Maroun	because em . . . . it was on a different . side
15	Milad	Emily your go
16	Emily	OK. last week we . . . we . . . . did an experiment . . . . . we had a. em a block of foam and we um.. stuck paddle pop sticks in it and we put . . . a. magnet. a bar of magnet.. into the em cradle that we made with the paddle pop sticks=
17	Milad	that's enough from you . .
18	Emily	=then we put another magnet on top and the result of this was . . . the magnet that we put on top of the cradled magnet did not . stick to the other magnet
19	Julianne	then when we turned it around. when we turned the other magnet around it it
20	Maroun	stuck
21	Milad	it stuck together because
22	Maroun	and it stuck together because . it was
23	Emily	it was on a different side
24	Julianne	it was on a different side and the other one's and . . .
25	Emily	and the poles are different
26	Julianne	and the poles are different
27	Milad	and em when . . we put on the . . . side it stuck together . . .
28	Julianne	because em it was on different sides/ because we put it on the on the 'thin side and it didn't and we didn't/ it didn't 'stick . .
29	Maroun	because the flat side is stronger than the thin side?
30	Emily	no because the poles are different
31	Milad	because the poles are different alright?
32	Julianne	we we finish

This group retelling activity provides an authentic context for comprehensible output (Swain 1985, 1996); the task itself is in reality a rehearsal for producing such output, since its purpose is for the students to focus on *how* they will report to the whole class. In her instructions, the teacher makes explicit the fact that how students talk is important: they must make what they say clear and comprehensible to their listeners, bearing in mind that the listeners did not share in the students' exeriences, and that the reporters will not have the science equipment with them. In linguistic terms, then, and as discussed in Chapter 5, what this group retelling demands is a more decontextualised register than the talk produced in the experiential work.

The notion of comprehensible output usually refers to the language produced by an individual, but the nature of the talk here, because it is a group task, suggests that this is exactly what the group as a whole is striving for. All children participate in jointly constructing this discourse. There is an ongoing negotiation of meaning through a number of interactional modifications, and as discussed in Chapter 2, this is a process closely associated with effective second language acquisition. For example, the lexical choice *block of foam* is finally reached through a progressive clarification of an appropriate way to name it, and this is built up by three speakers: *a pot, not a pot, a foam,* (repeated), *a block of foam.* No one student's contribution can be regarded as the source of the information, and no one contribution can be regarded as a solo text. Thus, for example, turn 11 continues the clause started by the speaker in turn 10. The prompt in turn 13, *because,* forces the speaker to continue and complete his statement. The main scientific understanding of the experiment is built up across seven turns (18 - 25) which together construct the statement: *when we turned the other magnet around it stuck together because it was on a different side and the poles are different.* Through the process of joint construction the wording is gradually refined towards more explicit and written-like language, and scientific understandings are reworked and modified (note that *different sides* becomes *different poles*). Individual students are scaffolded by the contributions of the group as a whole, and by taking part in the ongoing negotiation of meaning. Donato (1994) describes a similar process in a study of students learning French as a second language, as the students are negotiating the construction of *tu t'es souvenu* (you remembered). Although no student possessed the ability to construct this alone, they are able collectively to reach the correct form, leading Donato to argue that "these three learners are able to construct collectively a scaffold for each other's performance ... they jointly manage components of the problem, mark critical features of discrepancies between what

has been produced and the perceived ideal solution... and minimise frustration and risk by relying on the collective resources of the group" (Donato 1994, p. 45). Swain argues that through such collaborative dialogue and co-construction of knowledge, students who are 'novices' as individuals are simultaneously 'experts' collectively (Swain 1995b). The situational context of the text here, a 'rehearsal' for subsequent reporting, provides an opportunity for this to occur.

Swain also argues that output has a metalinguistic dimension whereby learner reflection on their language use helps them to internalise linguistic knowledge. Since the language in this text is also constructing science knowledge, it can be argued that through such talk, curriculum knowledge as well as language per se is constructed and internalised by the learners. Certainly the teacher is encouraging the learners to reflect on how they are speaking, when, on joining the groups for a few moments to check on their progress, she reminds them:

> you've remembered that your language has got to be really precise because the other children have got to try and get a picture in their mind ofwhat you did.

Swain argues that the notion of comprehensible input should not be restricted to simply 'getting the meaning across' but, to be more facilitative of acquisition, must incorporate the notion of conveying meaning precisely and appropriately. The situational context here encourages the students towards this.

Working in groups also provides contexts for peer teaching to take place. The following text [4] (7.6) is an example of such peer support. The texts are taken from a single conversation, when the children had been asked to sort a group of objects in any way they wished. Since they have also been given magnets, (intended for a later activity), they immediately consider the materials in terms of whether or not they will be attracted to a magnet. At this stage they are sorting the objects into two groups, and writing down the materials into two lists.

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[4] Because of the level of background noise when these texts were produced, it was not possible to put names to contributions. The four children were Vivienne, Emily, Maroun and Francois.

Text 7.6

1	pastic (*sic*)
2	plastic/ what is this pasta?
3	em pasta by its own (*indicating how it should be grouped*) this is plastic
4	yes/wood (*pointing to a pencil*)
5	this/ what's this?
6	blu tac
7	what *** that/ this was. together and this is there and this is plastic so it goes there/ that's one way (*referring to the groupings*) . . . another way is you could sort it/plastic . .
9	(*another child picks up pasta*) that's not plastic (*indicating pasta*) it's food/ this is food
10	what you eat
11	pasta/not plastic/

later

12	what's this called Maroun?
13	em split pins
14	split pins
15	OK I've finished/ how much do you have/ 1/2/3/4/5/6
16	1/2//3/4/5/6
17	you have to have seven things
18	seven 1/2/3/4/5/6
19	oh what did I . . ?
20	pins/ staples . . . lid/split pins (*reading list*)
21	where/ what lid
22	lid
23	lid/ you would not do lid
24	what's this?
25	needle
26	that's a pin
27	pin
28	oh lid/ that's a lid
29	this is a thumb tack and this is a pin
30	oh the thumb tack
31	yeah
32	what's this called? what's this called?
33	em . paper clip

later

34	and the needle/ you didn't write needle (*checking his list has the same number of items as Emily's*)
35	no I never wrote needle
36	no I didn't write needle/ I just put pin
37	oh
38	I wrote pin
39	what's that called . . .
40	a paper clip
41	I never wrote that (*comparing lists*) . . . . a a paper clip we've got to write paper clip
42	elastic . . (*holding rubber band*)

43	what's this called again em/ what's this called?
44	crayons
45	now this pasta/ I draw a pasta for this
46	what's this called? paddle pops
47	rubber band/ rubber band
48	what's this called?
49	coin/just write a coin . . or a token
50	pasta . . is this pasta?
51	yes

later

52	Emily how much do you have? (*checking how many items on list*)
53	what/ for what
54	for em this
55	1/2/3/4/5/6/7/8/9/10/ I got 10
56	1/2/3/4/5/6/7/8/9 . . one more
57	do you have dice?
58	yeah
59	and paddle pop stick
60	no
61	that's it
62	have we finished?
63	now we have to draw pictures
64	pictures
65	yeah
66	I can't even draw a paper clip
67	copy it
68	the Bambridge's scarecrow (*referring to drawing, laughter*)
69	with lip stick
70	what is this?
71	oh lid
72	lid
73	thumbtacks
74	what does split pin mean?
75	it's actually a paper fastener/ you can write split pin 'and paper fastener
76	what's a needle . . what's a needle
77	this (*showing*)

Requests for help from peers occurred frequently, see for example turns 5, 12, 24, 32, 39, 43, 48, 50, 70, 74, 77. The large number of these requests suggests how second language learners who appear to be fluent speakers may experience difficulty with less well known vocabulary items, particularly those which might be more familiar in the mother-tongue home domain. However what is also significant in this context for language learning is that every request for the name of an item is responded to, sometimes with several children contributing (9 - 11; 71 - 72). It is doubtful whether such instant and ongoing help would have been as accessible in a whole class context, or that the students would have asked for it so frequently.

In many of the transcripts, peer help like this was evident, although, as in this text, it was mainly restricted to questions of vocabulary, spelling and task procedure. As such it cannot be defined as scaffolding in the sense identified in Chapters 2 and 6, since the help usually focuses on *what* a learner should do, (and in some cases doing it for them), rather than on *how* something could be done (see for example, the following set of texts, where Emily simply tells Milad what to write rather than answering his question.) Nevertheless, the help given by peers is at the point of need and is ongoing; such help doubtless made it possible for some children to participate in and complete tasks which would have been daunting for them to do alone.

The following set of short texts (7.7) provide further examples of peer teaching and come from Classroom 2, Episode 24. The teacher had asked the students to write down one thing that had happened in their own experiment, and a generalisation about what they had learned 'overall'.

Text 7.7

Example 1

Milad: how do you spell generalisation Emily?
(Emily spells)

Example 2

Maroun: genulisation (sic) how you spell it?
(Julianne and Emily spell)

Example 3

Milad: do we have to copy you?
Emily: you can make one up on your own

Example 4

Milad: what you write?
Julianne: "all magnets have a side pole"

Example 5

Milad: what is you write that?
Emily: "when we turned the pole . . to to the north"
Milad: to the..

Emily: to the north

Example 6

Maroun: he (*referring to Milad*) have to do a over a overall [generalisation]
Milad: what's a overall?
Emily: just write like . . "if you put the north and the north together"
Milad: yeah that's what I'm writing
Emily: no that's/ write overall here
Julianne: so Miss knows

These examples are also significant in illustrating how a teacher's and students' perceptions of the function of a task sometimes differ. The children here are primarily concerned with what they perceive to be the *procedure* of the task. What appears to be important to them is the end product: Emily's help to Milad is concerned with what to write and where to write it, and, as the last comment suggests, the work is really for 'Miss'. The interpersonal function of language is foregrounded, with children concerned with directing each other and commenting on their own action; talk about the curriculum field itself, (the behaviour of magnets) is largely absent. This mismatch of intention was evident in other group tasks, with children often appearing to be more concerned with the procedures and product of the task, than with talking out their ideas. The following text (7.8) is a further example of this, and comes from Classroom 2, Episode 37.

In text 7.8, the teacher's purpose was to have the children retell their findings and develop some generalisations, and to this end she had constructed an information gap activity by splitting the initial groups into pairs and then regrouping each pair with a different two children. Each group of children were then to write generalisations about magnets on a large sheet of paper for class display. However there was little talk indicating the kind of thinking the teacher had been hoping for, or discussion about how the generalisations should be worded. Children simply read their existing lists to each other and copied each others' statements down, with most of the talk being about procedural matters such as the colours of the textas they should use, whose contributions should be written down, turn taking, and the neatness of the handwriting. It was not possible in this text to accurately identify which children were speaking.

Text 7.8

I'll write it down/ which
no no write the heading first
magnets . .
I write heading/ let me write heading
she's neater
well I'm writing
neatly
neatly I know/ I do go neatly
you have to use the ruler so you
make it
no no
straight lines
straight lines/ straight lines
straight lines
I'm doing it
swap/ want red?
what do I have to write?
you have to write the first one/ "all
"mag -/ "all bar magnets" (*writing*)
wait/ you've got finger prints in it
already
very sorry
that's not straight

At this point the teacher, overhearing the conversation, interjected with *as long as it's clear and people can understand it/ take the ruler away/ doesn't matter if it's not straight/ the idea is to get as many down as you possibly can* but by this time the lesson was almost over.

Taken in isolation, then, some of the group work observed indicated that students and teacher appeared to have different ideas about its purpose. Although the end product was usually in fact very close to what the teacher had requested (for example, here the students successfully produced a list of generalisations), the students' concern was often with the *procedure* of the task rather than the *principles* the teacher had been attempting to help them develop, and consequently there was sometimes little evidence of the kind of thinking and talking that the teacher had been planning for.

However, rather than simply dismissing such examples as unsuccessful second language teaching tasks, the point should be made that, even when the students' and teacher's ideas of the purpose of the group work appeared not to coincide, the group work fulfilled an important function: it created the intersubjectivity and common experiences necesssary for the long conversation of the classroom discourse to be maintained. What followed from the episode above, for example, was a whole class sharing of the writing of all the groups, with explicit discussion of the wordings of the generalisations and the accuracy of the science information. All children shared what their group had produced, and this level of participation would not have been possible if the group work session had not taken place. From the perspective of second language learning, then, working with peers created a number of supportive contexts for language development. It provided the shared experiences on which later discourse was built; it provided a context for discourse to be jointly constructed so that individual 'novices' collectively became 'experts' as a group; and it made available an ongoing and immediate source of help for individual learners.

While it has been argued that the group work in these classrooms appeared to be supportive of language learning, it is worth noting that it did not always result in a higher degree of interactional modifications than whole class work in the way that some research has suggested (Pica 1987). The transcripts indicate that group work in fact tended to produce fewer examples of negotiation than occurred in the teacher-guided reporting: as in the examples above, for example, unknown vocabulary items did not result in negotiation but in requests for help. There are however, a number of reasons why this might be the case, related to the nature of the group activities, and their purpose within the sequence of episodes. The group work in this study served a very different purpose from the kinds of activities that are more typical of direct language classrooms. In EFL classrooms, for example, group activities often revolve around information sharing activities, designed to elicit particular structures or functions of language, the use of which may be the main objective of the lesson. Research in SLA on small group work has tended to focus on such classes. Here however, group activities represent a *means* rather than a *goal*, in that their purpose is to build up a shared understanding upon which further language learning then proceeds. In addition, while general 'conversational' language may be developed through group work, given the shared resources of the students, a new (and as yet unknown) specialist register cannot be: access to this must depend on resources outside the group (such as the teacher). The success or otherwise of group work in the current study cannot therefore be judged simply on

the discourse produced at the time, but, as well, on the discourse with the teacher to which it gave rise later. The relative lack of negotiation in group work (at least compared to the teacher-student interactions) may also be the result of the group activities themselves, since although different groups often held varying information, students within each group were usually involved in collaborative work where they had access to the same information, a situation which Pica argues is less likely to produce negotiation between interactants (Pica 1987).

Of more significance for this study, however, is not that group work produced *less* negotiation than might be expected, but that teacher-student interactions in a whole class situation yielded a great deal *more*. Whole class talk, it would appear, *can* be highly supportive of second language learning. This is the subject of the following section.

Reflection on the Task: teacher-guided reporting

This stage proved to be the most valuable, within the four stages of the curriculum cycle, in the opportunities it provided for second language development. The significance of teacher-guided reporting for language development has already been discussed in Chapters 5 and 6, and those discussions will not be repeated at length at this point. In summary, key features of teacher-guided reporting which have been discussed include the following.

It has been argued that in the process of teacher-guided reporting children are supported in developing the language and curriculum knowledge encapsulated in the academic registers of school, and that a feature of this stage is the strong guidance provided by the teacher through her scaffolding. Teachers recontextualise the meanings of the students (Chapter 6) often recasting student wording through field and mode shifts, and reformulating the child's intended meaning with a more complete or appropriate recoding (Chapter 5). This focus on the teaching of a more decontextualised register, and the explicit guidance teachers give to minority learners as they learn to use these new ways of meaning, are clearly significant factors in the language development of minority learners.

As has already been discussed, the process by which this teaching and learning occurs, the nature of the interactions themselves, appears to be enabling of language development. In this study teacher-guided reporting allows the teacher to 'lead from behind', using contingent responses in a way similar to the kind of facilitative interactions that have been noted in first language development (Halliday 1973;

Wells 1981; Painter 1985). Teacher-guided reporting also provides opportunities for learners to initiate exchanges, a factor of interactions which is facilitative of second language learning (van Lier 1988, 1996; Ellis 1994), and for more dialogic interactions to occur than is typically the situation in the IRF three-part exchange.

The context of teacher-guided reporting has therefore already been shown to be enabling of second language development. In this section the 'micro-interactions' of parts of the discourse will be explored further to consider what additional evidence they provide of being contexts which are facilitative of second language development.

Clarification requests and student output : stretching and extending learner language

It has been argued that it is the quality rather than the quantity of interactional modifications which are significant for comprehension, and ultimately for acquisition (Ellis 1994). Requests for clarification place responsibility for solving the communication problem onto the student, unlike confirmation checks where the teacher solves the communication problem for the learner. Requests for clarification are thus more likely to 'stretch' learner language than direct confirmation checks from the learner (Pica 1988; Pica et al 1989). There are many examples of clarification requests in the discourse. The following exchange (text 7.9) between the teacher and Belinda is one such example:

Text 7.9

	STUDENT	TEACHER
1	B: em we put three magnets together/ it still wouldn't hold the gold nail	
2		can you explain that again?
3	B: we/ we tried to put three magnets together . . to hold the gold nail . . even though we had three magnets . . it wouldn't stick	

The request by the teacher for clarification results in a longer and more complete text from Belinda. This micro-context results in the student's language being 'stretched': the teacher's request for clarification puts a 'press' on her to produce more comprehensible output as she makes more of her reasoning explicit in the discourse. It is argued that it is only when the learner is 'pushed' in this way that language production aids acquisition (Swain 1985; Swain and Lapkin 1990), suggesting the critical role that can be played by the indirect feedback of the teacher

(that is, feedback which does not directly provide the target language or correct the student).

The following two examples (texts 7.10 and 7.11) are illustrative of the same process. Both come from a reporting session after the students had experimented in an open-ended activity using the magnets with a range of objects.

Text 7.10

	STUDENTS	TEACHER
1	we had a . . gold nail . . and . the gold nail . . neither of them/ neither/ both of the magnets won't . touch to the gold nail	
2	that's not real gold	
3	it's a screw	
4		say that again very loudly so that . Veronica can hear you back there
5	we had a gold nail and the gold nail would not touch/attach to any of the magnets	

In this text a comparison of turns 1 and 5 again illustrate how a second attempt at a response enables the student to produce a less hesitant and more comprehensible text.

In text 7.11, the student is describing how she had put a piece of foil between the magnet and a nail; the magnet attracted the nail through the non-magnetic foil.

Text 7.11

	STUDENTS	TEACHER
1		what did you find out?
2	L: if you put a nail . onto the piece of foil . . and then pick it . pick it up . . the magnet will . . . . . that if you put a . nail . under a piece of foil . and then pick . pick the foil up with the magnet . . still . still with the nail . . under it . . . it won't	
3		it what?
4	L: it won't/ it won't come out	
5		what won't come out?
6	M: it'll go up (*prompt*)	
7	L: it'll go up	
8	S: what'll go up?	
9	M: it'll go up	
10	S: whose group was she in?	

11		wait just a minute . . can you explain that a bit more , Lindsay?
12	L: like if you put a nail and then foil over it and then put the nail on top . of the foil . . the nail underneath the foil/ Miss I can't say it	
13		no you're doing fine I/ I can see
14	L: Miss forget about the magnet/ em the magnet holds it with the foil up the top and the nail's underneath and the foil's on top and put the magnet in it and you lift it up . . and the nail will em . . . hold it/stick with the magnet and the foil's inbetween	
15		oh so even with the foil in between . the . magnet will 'still pick up the nail . alright does the magnet pick up the foil?
16	L: no	

The student's first explanation (2) is extended but extremely hesitant. At turn 3 the teacher could have closed the exchange as she did in turn 15, by recasting what the student is attempting to say. Instead she demands a further contribution from the student by asking a question: *it what?* (3). When the student's meaning is not clear she asks a further question to elicit the missing actor: *what won't come up* (5). When this too does not result in a clearer explanation she asks for further clarification: *can you explain that a bit more?* (11). The student's next attempt repeats much of the information of turn 2, but is much less hesitant. However she stops with the very telling words: *I can't say it* (12). Even at this point the teacher encourages her to continue, this time with an interpersonal commment of reassurance (13). Lindsay's final attempt is the most successful and the least hesitant, incorporating the key fact that the foil was between the nail and the magnet, and, compared with the initial attempt (2), it is a far more complete piece of information.

The teacher's persistence in probing the student's responses by maintaining a demand for more clearly worded information from the student results in a steady increase in the comprehensibility of the student's output. As is evident from the visual layout of the transcript alone, the student talks far more than the teacher throughout this exchange sequence. Her language is clearly being 'stretched' (her comment *I can't say it* giving us some indication of just how much). The division of labour typical of the IRF exchange, where the teacher does most of the talking, is here redistributed, with the student rather than the teacher taking responsibility for making the communication clear. This is important in the light of some studies of

collaborative discourse which suggests that it may be so successful in clarifying communication that learners do not need to focus on the form of what they are saying (Trevise and Porquier 1986; Meisel 1987). The teacher finally does the job of recontextualising the student's meaning in more concise wording, but not until the fifteenth move, offering a greatly increased opportunity for negotiation of meaning over what would have occurred in a three part exchange. It is also worth noting that since increased negotiation results in increased comprehension (Pica et al 1987), the curriculum knowledge itself is also likely to be better understood.

In the following text (7.12) the teacher's responses again create a discourse context where the student is expected to take some responsibility in sorting out the communication problem.

Text 7.12

	STUDENTS	TEACHER
1	and like we can put em a nail under the * like move it around	
2		what happened?
3	it moved around where the magnet was	
4		explain that again in a big voice so that Charlene can hear you
5	we can put it on the 'chair the . nail . and you put the magnet on the bottom of the chair/ you put it to the bottom	
6		on the bottom of the nail?
7	on the bottom of the chair/ and when you put it to the right it goes to the right and when you put it to the left . .	
8		do you mean 'under the chair?
9	yes Miss	
10		so when you put the magnet 'under the chair . . the . nail followed it

In this text the student is describing how the magnet attracted a nail through the seat of a chair. Turns 1-3 do not contain sufficient information to be easily understood; however since the teacher had seen the experiment she would clearly have been able to take over at this point and recast what the student was saying. As in the other examples she chooses not to do this, asking for the student herself to clarify what she is saying: *explain that again* (4). This is a powerful teaching strategy in this text; in turns 5 - 7, with a brief confirmation check interjected by the teacher (6), the student is able to produce a more precise and comprehensible account. The interjections by the teacher (6 and 8) draw the student's attention to a

particular linguistic item (she appears confused between the meanings of *under* and *on the bottom of*), which in the teacher's final recasting receives marked stress. Apart from the provision of this word however, the student is able to improve the comprehensibility of the output herself. Being given a second opportunity to say something seems in itself to increase the student's ability to do so.

In the following text (7.13) the student begins first makes a brief statement, the meaning of which is not immediately clear. (She is referring to the fact that two magnets only attract when opposite poles face each other.)

Text 7.13

	STUDENT	TEACHER
1	B: the magnet could only stick on one side	
2		what do you mean could only stick on one side?.
3	*(B hesitates for 5 seconds, George tries to explain)*	no no George . 'let 'her 'try . .
4	B: Miss . . . . like if you put the magnet together	
5		two magnets together?
6	two magnets together . then it sticks and then you try the other side it doesn't stick	
7	yes	ahh . . so you tried putting two magnets together and . one side . they would stick together and the other side they didn't /alright we're getting some good information

Again the teacher asks for clarification (2). The student hesitates for five seconds, a very much longer wait-time than is usually allowed (Rowe 1986). For a second language learner however this increase in wait time is significant. Research suggests that when teachers ask questions of students, they typically wait one second or less for the students to begin a reply, but that when they wait for three or more seconds, there are significant changes in a student's use of language and in the attitudes and expectations of both students and teachers (Rowe 1986). As mentioned in an earlier chapter, the importance of wait time is presumably increased for students who are formulating responses in a language they do not fully control.[5] During the wait time here, the teacher does not allow interruption by more competent speakers

[5] See Krashen and Pon 1975 who describe the self correcting behaviour of an adult second language learner; given sufficient 'processing time' she was able to correct almost ninety five per cent of her errors.

(3). Despite the dialogic quality of the interactions in the teacher-guided reporting, where in general teacher talk is less strongly marked for status, both teachers regularly asserted explicit control when it became necessary to protect the participation rights of a speaker. Such 'protection' is important for less confident children if they are to have equality of conversational rights with more assertive speakers. Given this extended wait time, and some help from the teacher (5), Belinda, like the speakers in the other texts, is able to increase the comprehensibility of the output.

The following text (7.14) also demonstrates the effect that wait time, and the opportunity for a second attempt, can have on the quality of student output.

Text 7.14

	STUDENTS	TEACHER
1		try to tell them what you learned . . . OK . . . (*to Hannah*) yes?
2	em er I learned that em when you put a magnet . . . (*laughter from Hannah and children as Hannah is attempting to explain without demonstrating with her hands*) when I put/ when you put . . . when you put a magnet . . . on top of a magnet and the north pole poles are . . . . . *7 second pause, Hannah is clearly having difficulty in expressing what she wants to say.*	
3		yes yes you're doing fine . . you put one magnet on top of another . . .
4	and and the north poles are together er em the magnet . . . repels the magnet and the other magnet . . . sort of floats in the air?	
		The teacher invites other contributions, and then returns to Hannah. She invites Hannah to first show the experiment to the other students, and then asks her to explain it again.
5		now listen . . now Hannah explain once more . . . alright Hannah . . . excuse me everybody (*regaining classes attention*) . . listen again to her explanation

6	the two north poles are leaning together and the magnet on the bottom is repelling the magnet on top so that the magnet on the top is sort of . . . floating in the air	
7		so that these two magnets are *repelling* each other and . . . look at the force of it.

The support given by the teacher comes at a critical point (3), when the student can go no further alone (2). The importance of such contingency has already been discussed. Here it should be noted that it requires a skilled teacher to give students a long enough time to make what they say comprehensible to others, while not leaving them without help to the point when they become embarrassed, when a 'press' on language resources results in a 'stress' for the learner. In this study students did not appear to become uncomfortable or embarrassed by the length of the wait time; on the contrary there were always enthusiastic bids for turns to offer contributions. The insistence by the teacher on a student's right to speak without interruption, and the explicit rules for participation, appeared to create the kind of interactional environment where extended 'wait time' was seen as normal, and was not a source of embarrassment for the learner nor impatience for the listeners. Most important for the positioning of minority learners is that, either alone or through scaffolded interaction with the teacher, they were able to successfully complete what they wanted to say, and as a result were positioned as capable interactants and learners.

As a result of the teacher's response (3) Hannah is able to complete what she wants to say. The recount is very hesitant however, the upward (questioning) intonation at (4) suggesting that Hannah feels somewhat unsure of herself. By comparison her second attempt (6) is far less hesitant, and more complete. The intonation is now unmarked, suggesting an increase in confidence. The second attempt encouraged here by the teacher clearly results in more comprehensible output by the student. Other studies have suggested similar results when learners are given time to reformulate their own contribution to the discourse. Forman and Cazden (1985), for example, describe how, with the help of the teacher, a third grade child progressively refines a set of instructions which she had to give to other children. On her third attempt, she achieves clear instructions without hesitations and repairs.

A context for noticing

A more psychological perspective on second language learning is represented by the notion of 'noticing'. As discussed in Chapter 2, it has been proposed that in order to learn new language, learners must first pay attention to the linguistic form of the input, a process referred to as 'noticing' (Schmidt 1990; Ellis 1994; Swain 1996) or as 'preliminary uptake' (Chaudron 1985). Before the learner can be said to have learned the new language, there must be a further step of 'comparison', when some comparison must be made by the learner between what they are currently able to say, and the input they have heard: the learner must 'notice the gap'. It is only when the learner perceives the gap between the form of the input and their own use of language that acquisition will take place (Faerch and Kasper 1986; Schmidt 1990; Ellis 1994; Swain 1996). It needs to be considered therefore how far the discourse patterns so far discussed construct the kind of contexts where it can be reasonably expected that students would be likely to notice and compare their own language with the 'target' language (defined here as the lexis and grammatical patterns occurring in the more context-reduced and field-specific registers of school).

It has already been noted that many exchanges in teacher-guided reporting sessions follow a characteristic pattern: student initiation of meaning followed by teacher recasting of wording. Ellis (1994) argues that in the process of student-initiated interactions, the frequency of specific linguistic forms and thus their saliency to the learner (and therefore the likelihood that they will be noticed) increases. The following texts are examples of the kind of recasting to which Ellis refers.

Text 7.15

	STUDENTS	TEACHER
1		Maroun/ something that you can tell me that you found out last lesson
2	Ma: Miss I thought that all metal can **stick** on magnets but.. when I tried it some of them they **didn't stick**	
3		OK so you thought that no matter what object/ if it was a metal object it would be **attracted** to the magnet/ interesting .

Text 7.16

	STUDENTS	TEACHER
1		so what's this magnet trying to do . . to that one?
2		
3	it's trying to **lift it up**	
4		OK it's **repelling** isn't it/ it's **not attracting** like it did the other way. that magnet's **repelling**

Text 7.17

	STUDENTS	TEACHER
1		OK can you then tell me what you had to do next . ?
2	when we had em the things the first one like if you put it up in the air like that. the magnets you can feel . feel the em . that they're **not pushing**?	
3		when you turn the magnet around? you felt that
4	**pushing** and if we use the other side we can't feel pushing	
5		OK so when.. they were facing one way . . they/ you felt the magnets '**attract** and stick together/ when you turn one of the magnets around you felt it.'**repelling**.. or pushing away . . OK thank you well done Charbel

In each case the teacher's response is immediately contingent on what the student has said. In 7.15, *stick* is recoded as *attract*, in 7.16 *lift it up* is recoded as *repelling*, and in 7.17 *not pushing* is recoded as *attract* and *pushing* as *repelling*. In 7.16, the teacher repeats the two key lexical items associated with the topic at that point, defining one in terms of the other: *it's not attracting, it's repelling*. This strategy enables her to 'recycle' the item *attract* while responding to what the student has said. In 7.17 she provides both new items but also appropriates and incorporates the student's coding (*pushing away*), reminding the student of the meaning of the new item but also helping him make a comparison between the two codings.

Since the teacher's responses are triggered by the intended meaning of the student, it would appear likely that such semantically contingent responses would be noticed by the students, since the focus item relates to what the student wants to say at that moment. The new item, in other words, is provided at precisely the moment it is needed and contextualised within the meaning-intentions of the speaker. It would also seem that not only is a new linguistic item likely to be 'noticed' in such a

situation, it is also likely to be 'compared' since both student and teacher forms are 'on display' in the discourse of the exchange. In 7.17, the comparison is made more overt by the teacher herself who makes explicit the relationship between the everyday and the scientific form: *repelling or pushing away.*

A possible context for noticing and comparing is also offered by those occasions when the teacher uses a prompt to remind the student of a new item or a linguistic form, (described in Chapter 5 as a *Reminding and handing over* strategy). The following three texts exemplfy this.

Text 7.18

	STUDENTS	TEACHER
1	G: the magnet doesn't stick onto the cork	
2		remember we're scientists now Gina .
3	G: em. ah! the magnet attracts	

Text 7.19

	STUDENTS	TEACHER
1	Fr: the magnet attracts to	
2		careful this is what we did yesterday
3	Fr: the magnet attract . ed attracted to the other magnets	

Text 7.20

	STUDENTS	TEACHER
1	G: *(attempting a generalisation)* the magnet	careful careful George we're not talking about just this one
2	G: magnets attract safety pins	magnets

As noted earlier, while the teacher takes the responsibility for drawing the student's attention to a linguistic or communication problem, it is often the student who is given the responsibility to improve what they have said. Learners appear to learn more when they focus on and correct their own errors, than those times when corrections are made for them, presumably because of the increased cognitive processing that must occur when one sorts a problem out for oneself. The teacher clearly believes that the students are able to make their own corrections, but without her prompt it is doubtful that they would have done so: the prompt serves to activate and recycle students' prior learning. These examples suggest that the reminder causes the students to focus on the particular word, to notice and reflect on their own language, to recall the appropriate language, and finally to improve the output.

Opportunities for 'noticing' may be much more direct. At times, getting the children to focus on something (notice it) is the teaching objective itself, as in the following text (7.21) where the teacher is introducing a new lexical item, *attract*.

Text 7.21

TEACHER
I want you to think . of just what you did yesterday/ of the materials . that we had yesterday/ and I'm going to help you with a word today . that we didn't . . . no one has said/ because remember we're scientists . and we need to use the proper words . all of you 'told me . and explained it very well/ now we're going to learn the proper scientific words for this . what happens is . that magnets . at'tract (*great emphasis*) . certain things and so rather than say that it grabs it or it sticks to it . what we say is magnets at'tract and that means . this kind of thing (*demonstrating*) so if I . am a magnet and I . at'tract . Carol Anne I . . 'bring 'her 'to 'me (*demonstrating*) . attract . so I'd like for us to think of the other things . that the magnet attract'ed . this is yesterday/ now think back in your groups . think of the things that the magnet at'tracted (*writes "attracted "on board*)

First it can be noted that the teacher reviews the previous day's work, ensuring, as Wong-Fillmore suggests, that the new word will be heard in the context of previous learning. In addition she draws the children's attention to the fact that the new word has a particular function: it is *the proper scientific word*. Thus she locates the word in the context of the science register but at the same time relates it to what the children had said earlier. She also demonstrates the meaning of the word, using gestures and acting out the meaning with one of the students, (thus mode shifting, from more to less written-like, in very much the same way as described in Chapter 5 in relation to the unpacking of written instructions). In addition she offers an 'everyday' explanation of the meaning, (*grabs it, sticks to it, bring her to me*). In so doing, she is making explicit in the discourse the kind of comparison (here between the everyday and scientific terminology) that Ellis and others hypothesise might occur in the learner's head before a new item is able to be integrated into the learner's own linguistic system. In the text there is, as well, considerable repetition of the new term (six times) and the word is also presented in another mode, (written on the board). Finally, the teacher uses considerable emphasis on key terms: *attract* and *bring her to me* carry heavy stress and are preceded by the 'pregnant pause' discussed earlier. If, as Schmidt (1990) argues, 'noticing' requires a focal awareness by the learner then it would appear likely that such repetition and multiple access to meaning increase the likelihood of 'noticing' (even though it does not of course guarantee it).

This text would equally well have served as an example of comprehensible input, and as a further example of what was discussed earlier in this chapter as 'multiple access'. It can perhaps be argued, then, that where students have multiple access to the language, and where there is a focus on a particular item, the process of noticing is more likely to occur than in contexts which are less focused and less message redundant. Perhaps of equal significance in considering what might cause students to 'notice' new language is the use to which they themselves will put the language. In the example above, the teacher's focus on the new item immediately preceded the teacher-guided reporting session, at which the teacher regularly reminded the children that they were 'learning to talk like scientists'. There was therefore an expectation that the new item would be of immediate use. Presumably if the learner sees a purpose in learning a new piece of language, if there is some personal 'investment', then there is reason to notice.

Teacher/student interactions: the extended sequence

It has been argued throughout this section that the teacher-guided reporting sessions offered many opportunities for language learning. Central to these opportunities is the nature of the interaction between teacher and student. This is now examined in more detail, by exploring how different types of interactions can be theorised and analysed, and what this analysis means for pedagogical practice. For illustrative purposes, three texts are included here, which taken together represent a movement from more to less teacher-controlled. Text 7.22 occurred at the end of a teacher-guided reporting episode when the teacher was focusing on a particular language form. Texts 7.23 and 7.24 are also taken from teacher-guided reporting episodes.

Text 7.22

	STUDENT	TEACHER
1		what if I try the south pole of this magnet and the north pole of that magnet/ yes Francois/ come on/ a sentence
2	the south pole and the north pole will attract	
3		good boy/good Francois/ alright and let's try the south pole of this magnet and the south pole of the other magnet/Stephanie?
4	the south pole and the south pole will repel.	
5		good

Text 7.23

	STUDENT	TEACHER
1		Maroun . something that you can tell me that you found out last lesson
2	Ma: Miss I thought that all metal can stick on magnets but when I tried it some of them they didn't stick	
3		OK so you thought that no matter what object/ if it was a metal object/ it would be attracted to the magnet/ OK interesting/ Milad?
4	Mi: I thought I thought that em the metal coins stick onto the magnet . . it wouldn't/ I put it near it and it didn't got stuck onto it	
5		OK/ it was attracted to the magnet?
6	Mi: no	it wasn't/ OK good/ Fabiola?
7	F: em em I thought that em the . . . em . . Miss what was the object that em could st . . em like . . the coin could stick onto the magnet but it wouldn't	
8		OK you/ you predicted that it did/ it would be attracted to the magnet and it wasn't.

Text 7.24

	STUDENTS	TEACHER
1		tell us what you found
2	L: if you put a nail . onto the piece of foil . . and then pick it . pick it up . . the magnet will . . . . . that if you put a . nail . under a piece of foil . and then pick . pick the foil up with the magnet . . still . still with the nail . . under it . . . it won't	
3		it what?
4	L: it won't/ it won't come out	
5		what won't come out
6	S: it'll go up (*prompt*)	
7	L: it'll go up	
8		wait just a minute . . can you explain that a bit more Lindsay?
9	L: like if you put a nail and then foil over it and then put the nail on top . of the foil .. the nail 'underneath the foil . Miss I can't say it	
10		no you're doing fine I/ I can see

11	L: Miss forget about the magnet/ em the magnet holds it with the foil up the top and the nails' underneath and the foil's on top/ and put the magnet in it and you lift it up . .and the nail will em . . .hold it/stick with the magnet and the foil's in between	
12		oh so even with the foil in between/ the magnet will 'still pick up the nail/alright does the magnet pick up the foil
13	L: no (1:7)	

Text 7.22 is an example of an IRF sequence. The teacher expects a particular kind of response (here, a 'sentence') and there is only a narrow range of possible answers. In her feedback move, the teacher evaluates the student (and by extension, his answer) positively, and then closes the exchange, before moving on to invite a response from Stephanie. The feedback move in such interactions does not simply bring closure to an interaction; it can also serve to 'close down' further thinking by students (van Lier 1996).

Text 7.23 is a more 'dialogic' interaction (as defined in Chapter 4). As discussed earlier, such interactions differ from an IRF sequence in that the topic of the exchange is determined by the student, and the feedback move is often a recast of the student's meaning. In such interactions the teacher 'leads from behind'. Again, however, the exchange is closed at this point and the teacher moves on to another student.

Text 7.24 is the most dialogic of the three. Like the previous text, the topic of the exchange is determined by the student, and the teacher, though leading the discourse through her questioning, again 'leads from behind' eliciting from the student a more extended contribution. This time however the result is an extended sequence of exchanges. The teacher's first initiating move is to invite a student to contribute information about the topic, then following the student's response she elicits from the student a clarification and extension of the proposition. The teacher's feedback move is therefore not an 'evaluation' but a further question designed to elicit further information from the student. In this way the initial exchange becomes extended as the teacher helps the child to extend each response in their subsequent moves.

It has already been argued that exchanges like text 7.24 would appear to be enabling of second language development, in that they provide opportunities for

comprehensible output through negotiation. It is therefore relevant to consider how text 7.24 differs from text 7.23 in the kind of interactional pattern that it constructs. Wells (1996) points out that in most analyses of classroom discourse, more extended texts between teacher and student, (like 7.24), could be analysed as a succession of topically related exchanges or as a single instance of triadic dialogue, with the teacher's request for more information being analysed as a type of follow up move. However, as he points out, this interpretation does not capture the essential difference in the feedback move between texts like 7.23 and 7.24. Sinclair and Coulthard (1975) in fact propose three functional categories of act for this move: *accept/reject, evaluate* and *comment*. *Comment* is further broken down into *exemplify, expand,* and *justify*. Mehan's category of evaluate (Mehan 1979) is also broken down to include *reformulate* or *correct*. It would seem then that the feedback move is realised in a number of different ways each of which significantly affects the progress of the discourse.

Wells' (1996) proposes an alternative analysis for extended interactions such as text 7.24. He argues that in conversation there is a tendency within an exchange for moves to decrease in 'prospectiveness', that is, the degree to which a move expects a response, the most strongly prospective move being a demand. In the classroom, a teacher's initiating move realised as a question to a student is thus strongly prospective. Outside of the classroom, conversations made up of single nuclear exchanges in fact occur far less often that more extended sequences, since, as Wells points out, a second principle accompanies the principle of prospectivess. At any point following the initiating move, a participant can *increase the prospectivess* of their own move so that it in turn requires or expects a response. Thus, in the third text above, the third move in the first exchange (the teacher asks: *it what?*) can be interpreted not as an evaluation or a feedback move which closes the exchange, but as a pivot for two linked exchanges. As a question, it is also a highly prospective move. (In Wells' proposal, Sinclair and Coulthard's categories of feedback such as *exemplify,* or *expand,* could also be analysed as 'pivotal' response moves.) Through these 'pivot' moves, sequences of exchanges can be built up, with each 'pivot' initiating a further exchange which extends or qualifies the previous exchange in some way. Wells refers to such an extended set of exchanges as a 'sequence', defining it as a nuclear exchange plus a number of dependent exchanges which extend and are dependent on the initial nuclear exchange. He argues that in understanding how discourse is jointly constructed, it is this unit, the sequence, which is the most functionally significant.

In an analysis of the stereotypical IRF exchange, Newman, Griffin and Cole (1989) argue that the final feedback move is a significant one which plays a gatekeeping function:

> Unless a teacher goes into a lecture format, this gate-keeping turn is about the only thing that a teacher can use to make sure that the proper information is available for learning and that improper content is removed from consideration by the lesson participants.
> (Newman, Griffin and Cole 1989, p. 125)

A major function of a feedback move is for the teacher to supply the 'correct' information through presenting the point of view which is congruent with the curriculum objectives. When IRF exchanges are considered from the perspective of learning, it is significant that it is in fact the teacher who is not only saying more, but doing most of the cognitive work too; it is often she who takes responsibility for providing the relevant information. Yet, as has already been argued, second language learners need more opportunities than this provides for extended discourse, both from the perspective of language learning per se, and in terms of their understanding of curriculum 'content'.

Wells' analysis (Wells 1996) is helpful in suggesting how this might occur. When the third move is exploited to become a 'pivot', (by, for example, the student being asked to clarify), then, in Wells' words, the 'division of labour' potentially shifts, and the student takes on more of the responsibility in helping to jointly construct the information. The nature of this third move in the exchange is therefore critical: when it is realised as a 'pivot', rather than as a reformulation or an evaluation, it can lead to more extended sequences where the discourse is opened up and the student's thinking can be articulated. The choices made by the teacher at this point thus determine the direction in which the discourse can potentially move. The choice of a pivot move both depends on and develops the intersubjective understanding by the participants about the goal of what they are engaged in. It is perhaps the teacher's choices at this point in the exchange that can help define more precisely what is meant by a 'contingent' response; Shuy (1991) for example, distinguishes between *recitation* teaching (largely dependent on the IRF exchange) and *responsive* teaching, arguing that responsive teaching uses contingency questioning rather than evaluation questioning. The use of a pivotal move by the teacher also means of course that what is about to be said cannot be predicted: the exact meaning of a sequence of discourse which is about to be constructed cannot in such sequences be anticipated in advance, even though the 'point' of a sequence is

typically to be found within the initiating move of the teacher. Wells concludes that it is in such moment to moment joint construction of meaning that the 'craft' of teaching is found (Wells 1996).

Wells' theoretical analysis is valuable in its potential to show alternative discourse patterns which are likely to be more enabling of second language development. The three texts (7.22-7.24) discussed above are analysed here in the light of Wells' framework (figure 7.1). The analysis demonstrates how increasing the prospectiveness results in a different kind of discourse.

Fig 7.1 Increasing the prospectiveness

KEY to abbreviations

Type of exchange

Nuc = nuclear exchange
Dep = dependent exchange

Type of move
Init = Initiation
Resp = Response
F/back = Feedback

Function of move
dem. = demand for information
inf. = giving information
ack. = acknowledgement of response, and/or evaluation
reform. = reformulation

(Adapted from Wells 1996)

Text 7.22

STUDENT	TEACHER	
	T: what if I try the south pole of this magnet and the north pole of that magnet/ yes Francois/ come on/ a sentence	Nuc Init. *dem*
F: the south pole and the north pole will attract		Resp. *inf*

	good boy/good Francois/	F/back *ack*
	alright and let's try the south pole of this magnet and the south pole of the other magnet/Stephanie?	Nuc Init *dem* .
S: the south pole and the south pole will repel.		Resp. *inf*
	good	F/back *ack*

Text 7.23

STUDENT	TEACHER	
	Maroun . something that you can tell me that you found out last lesson	Nuc Init *Dem.*
Miss I thought that all metal can stick on magnets but.. when I tried it some of them they didn't stick		Resp. *Inf*
	OK so you thought that no matter what object if it was a metal object it would attracted to the magnet/ OK interesting Milad?	F/back *Reform.*
I thought I thought that em the metal coins stick onto the magnet . . it wouldn't/ I put it near it and it didn't got stuck onto it		Nuc Resp *Inf*
no	OK it was attracted to the magnet? it wasn't OK good	F/back *Reform.*
	Fabiola?	Nuc Init *Dem.*
em em I thought that em the .. . em . . Miss what was the object that em could st. . em like . . the coin could stick onto the magnet but it wouldn't		Resp *Inf*
	OK you/ you predicted that it did it would be attracted to the magnet and it wasn't.	F/back *Reform.*

Text 7.24

(Note: Utterances marked (*) represent an 'aside' by two students and are not considered for the purpose of this analysis.)

Student	Teacher	
	tell us what you found	**Nuc.** Init. *dem*
if you put a nail . onto the piece of foil . . and then pick it . pick it up . . the magnet will . . . . . that if you put a . nail . under a piece of foil . and then pick . pick the foil up with the magnet . . still . still with the nail . . under it . . . it won't		Resp. *inf.*
	it what?	**Dep.** F/back realised as pivot *dem*
it won't/ it won't come out		Resp. *inf*
	what won't come out	**Dep** F/back (as pivot) *dem*
*it'll go up (prompt)**		
it'll go up		Resp. *inf*
*what'll go up?**		
*it'll go up**		
*whose group was she in?**		
	wait just a minute . . can you explain that a bit more , Lindsay?	**Dep** F/back (as pivot) *dem*
like if you put a nail and then foil over it and then put the nail on top . of the foil . . the nail 'underneath the foil/ Miss I can't say it		Resp. *inf*
	no you're doing fine I/ I can see	**Dep** F/back (as pivot) *dem*
Miss forget about the magnet em the magnet holds it with the foil up the top and the nails' underneath and the foil's on top and put the magnet in it and you lift it up . .and the nail will em . . .hold it/stick with the magnet and the foil's inbetween		Resp. *Inf*

	Oh so even with the foil in between . the . magnet will 'still pick up the nail . alright	F/back *reform.*

In the first two texts, the feedback move allows no opportunity for a sequence to develop. Its replacement by a 'pivotal' move in the third text produces a sequence in which the dependent exchanges allow for an exploration of the student's meaning. The reformulation eventually comes after five exchanges; in unextended sequences, such as text 7.23, the reformulation is given in the feedback move at the end of the first exchange, which results in the student having done less of the 'work' in the co-construction. By contrast, in text 7.24, the information (which could have come much earlier from the teacher if she had used an feedback move in the nuclear exchange), in fact comes from the student. The teacher holds back the reformulation and this produces a different 'division of labour' in the discourse. This redistribution of labour represents a strategy both for prolonging negotiation (thus facilitating second language development) and of using discourse as a 'thinking device' (cf. Vygotsky, Lotman and others).

In these classrooms the following examples from a number of teacher-guided reporting episodes all realise moves which occurred in a feedback position but produced an increase in prospectiveness. They illustrate the range of ways this pivotal move can be realised, and show how the teachers maintained a sequence of exchanges with individual children:

wait just a minute . . can you explain that a bit more Lindsay?
so what does that tell us?
can you explain that again?
what do you mean *could only stick to one side*?
I don't understand / what do you mean Francois?
can you tell me that again?
what do you mean by that?
are you saying/ what does that mean?
can you come up here and tell us what you meant by that?
can you just expand on that a little bit more about what you mean?
what makes you say that?
what do you mean/ 'the wrong one'?

It has not been the intention in this section to argue that all teacher-student exchanges should be extended sequences, since, as Chapter 6 has argued, exchanges like texts 7.22 and 7.23 are more appropriate on some occasions and for some

purposes. Rather, such an analysis needs to be seen as a way of presenting discourse *options* for teacher-student talk which may offer more opportunities for certain aspects of language learning.

Teacher-guided reporting: common features

Teacher-guided reporting sessions shared a number of features in common which made them enabling contexts for language development. First, there is always an initiation by the teacher which does not presuppose a specific answer. Reporting sessions usually began with the teacher asking: "what did you find out?" or inviting children to "tell us what you discovered". To such questions there can be no prescripted single 'answer' in a teacher's head; children are not expected to follow a particular 'script', even though, as was shown in Chapter 6, teachers usually appropriate these responses to build up the more generic script that fits with the learning objectives of the curriculum, and thus have some expectations about what counts as an appropriate response. Within the immediate exchange however, there is considerable freedom for students to initiate particular topics, allowing them to establish intersubjectivity with the teacher. The students, in a sense, are given the freedom to embark on the exchange on their own terms. At the same time, their linguistic resources are stretched by the teacher, and they are helped to produce a more complex and appropriate coding through the teacher supplying critical chunks of language at the right moment, a process which has been shown to be facilitative of ultimate uptake (Ellis 1985; 1994). As has been suggested in Chapter 6, such a process requires a contingent responsiveness by the teacher. In proposing that contingency is the quality of language use that can be most directly associated with engagement and learning, Van Lier (1996) defines the conditions for contingent language acts in terms remarkably similar, at a macro level, to the process of teacher guided reporting and, at a micro-level, to the dialogic interactions that typically occur in those episodes:

> the conditions for a contingent language act are set up by alluding to the familiar, the given, the shared, then a surprise is sprung in the form of the new, the unexpected, and then joint interpretative work is undertaken which simultaneously connects the new to what is known, and sets up expectations for what is to happen next.
> (van Lier 1996, p. 172)

In teacher-guided reporting episodes, each sequence of exchanges begins with reference by the student to familiar understandings, and these are then

recontextualised and connected to the 'new' through joint interpretative work by teacher and student. Teacher-guided reporting episodes appear by their nature to construct the conditions for contingent language acts to take place, and for this reason must be viewed as highly facilitative contexts for language development.

In addition, as has been shown, the teacher-guided reporting episodes are frequently occasions when the discourse takes on a dialogic rather than a direct instructional quality, and at such times there is an increase in the prospectiveness of the teacher's moves: more is expected of the children as interactants. Making what is said comprehensible requires the speaker to take the needs of the audience into account. In order to do this, the assumed knowledge of the speaker (their own understanding of what happened) must be made explicit to the listener. The teacher's clarification move often indicates to the learner where their message is unclear or incomplete, and what other information the audience needs to have. Though the teacher helps the learner select what is relevant to the comprehension of the listeners, for example: *what won't come out? what do you mean by . . ?* she usually does not, at least initially, provide this information herself, and closes the sequence only when the student has had opportunity to clarify their own meaning.

For this process to occur in the classroom requires not only a focus on the nature of the teacher's response moves, in particular of the feedback or evaluation move, but also, and perhaps more fundamentally, a change in the teacher's orientation towards what counts as valued knowledge in the classroom. If knowledge is seen as something held by the teacher which must be transmitted to students, there is little motivation or justification for according much air space to hear and probe a student's view of things. In these texts, however, the 'holding back' by the teacher, the contingency of her responses, the extended wait time, the nature of her initiation moves, and the willingness to probe unclear student responses are all compatible with a view of knowledge which sees it as something co-constructed by teacher and learner, and a view of learners which acknowledges and accords respect to their current understanding. These features of the discourse are also compatible with the notion of the zone of proximal development where a learner is expected to take responsibility for what they can do alone. Too often, as discussed earlier, interactions with second language learners in mainstream classes suggest that not enough is expected of them as interactional partners (see, for example, Torr 1993) and they are given insufficient recognition and responsibility for what they *are* able to do alone. It can be concluded, then, that a pedagogy which foregrounds the role of interaction in the co-construction of knowledge, and which positions students as

active contributors, is likely to provide the kind of discourse contexts which are enabling of second language learning.

It has been suggested that different kinds of input and interaction are needed to facilitate acquisition at different stages of a learner's development (Ellis 1994). From a microgenetic perspective, it appears from this study that different kinds of interaction were needed at different points in the unit of work (a point also made in Chapter 6), depending on the stage students had reached in developing the appropriate register features, and on the particular objectives of the teacher. The type of pedagogical goal influences the discourse and this changes with each of the four stages of the teaching cycle. By examining some of the micro-contexts which occur at each stage, this section of the chapter has suggested the second language learning opportunities that each stage affords.

PART 2: STUDENTS' PERCEPTIONS

Students' own perceptions of their learning, and how helpful they found the focus on talking, is also of interest. Although not a great deal of time was spent in reflecting with students on the processes of their learning, the data that are available suggest that students found helpful the many opportunities for talk in the unit of work. The data in this section are drawn from discussions with teachers, interviews between students and myself, and student journals.

The following text (7.25) comes from the end of a reporting session, prior to the students carrying out some writing. The teacher and students begin by talking about some of the differences between speech and writing, but continue with a short discussion about the usefulness of talk as a preparation for writing:

Text 7.25

	STUDENTS	TEACHER
1		we've helped each other to find some words that we're going to write . . now before we write . . what are some differences/ what are some differences that you can think of between writing and speaking? / I want you to think about when you talk and when you write . . what are some differences Amanda?

2	when you talk it's hard because you have to put your hands in your pockets (*referring to a reporting session when the teacher encouraged students to explain without using gestures)*	
3		oh (*laughing*) when we did that exercise/ yes that was hard/ Jennifer
4	when you talk/ when you write/ em the/ you think . . when you talk you don't know what to say	
5		so Jen's saying that she has time to think when she writes and that/ that helps a lot . . you don't have the same 'thinking time/ good anybody else have . . the difference between writing and speaking, Bernadette?
6	you (*unclear*)	
7		yes that's true too/ George?
8	Miss when you're writing you need more detail than what you . . . when you're speaking	
9		mm/what does he mean by that Joseph?
10	when you're writing you have to make the people . . you have to let the people understand what you're writing and when you're doing something they could 'see what you're doing . . . what you mean	
11		good/ he said that when you write you have to let the people understand what you're writing/ but when you're talking they can see/ so George says you need more detail when you write than when you talk/ Amanda?
12	like when when you're talking he always goes um um and you don't write it in your book	
13		that's right you don't write that kind of thing in your book/ any other differences that you . . . just a question/ which do you find easier/ writing or speaking
14	writing	
15		you find writing easier . . that's interesting Francois
16	speaking Miss because the/ explaining like if like/ if someone didn't understand you got to ask them what does it mean/ that's how it's easier	
17		ah so you can/ you can talk to somebody right away and get an answer/ Amanda

18	I think speaking's more easier because you go more faster	
19		you go faster
20	yeah	
21		Jen?
22	I think writing's more easier because it's when you speak it (*unclear*)	
23		OK/ I see/ so you feel because you have more time to think about it you you find it easier to write/ well that's interesting/ anybody else have any other comment before we go away/ of what helps you to write 'better? Gina?
24	practice?	
25		yes/ Angie?
26	your brain	
27		your brain yes
28	reading because of/ Miss if you look/if you took a look you didn't know how to spell that word you could look in the dictionary	
29		yes a dictionary/ what we've been doing here/(*referring to the reporting session*) what we've been doing here/ does that help you at all to write? Lindsay?
30	it helps when you share with others	
31		it helps when you share with others what . . by writing or by talking?
32	both	
33		both/ so you like the idea of talking before you write or no/ does that help at all? what we've been doing here/ I don't know/ that's what I need to know/ does it help to do this first? Belinda would it have been easier to just have you go off and write/ that's interesting Joseph/ do you find this kind of thing is easier first before you write or do you like just to go and write?
34	when you speak you know what you're going to write in the book/ what you're going to write in the book and	
35		(*teacher nods*) what do you find Carol Ann? do you like to talk about things first before you write or do you like to just go directly and write
36	I like to speak out so I can (*unclear*)	
37		mm/ one last comment

38	Miss in writing you have to like draw a few pictures so they get a picture in your mind of something	
39		you have to/ you have to/ Mario you haven't had a chance to say anything
40	Miss I think that em/ I/ I think you go and do/ do what you want to do/ before you write you have all . . the . . more information to know what you're going to write	
41		so/ so you like to talk about things first?
42	yes Miss because if you talk about things first you you/the the person might helped you get more information	

A student in the same class wrote the following comments in her journal:

> Not only did I learn from what I have experimented but from others who have shared their ideas with the class and I. They shared things about the two sides of the magnets even before we learned what they were called, and why they repel. It was very interesting because we asked questions that were impossible to answer, and in that time I learned how to respond to others what I think the answer was.

I visited the same teacher in the following year, after completing the collection of data on which this study is based. The teacher had grown increasingly interested in the role of spoken language in all curriculum areas and in what students themselves could tell a teacher about what helped them to learn. In the science unit the children had then just completed (on how gears work), she had followed closely the same sequence of activities as those described in this study: children had first taken part in experiential work, reported on it, and then written in their science journals. Although not part of this corpus of data, the context is similar enough for the following student comments to be of relevance. The discussion took place after students had completed journal writing, which was particularly well written by many of them, and was in response to the teacher asking them what had helped them to write. No recording was carried out on this occasion, and the examples below consist of individual comments taken from field notes:

Teacher question: Can you tell me what helped you to write clearly?
Individual student comments:
I discussed it with my group

talking helped me
we all had a turn at speaking
the others helped
it helped when we discussed
it was easier because we learned about it a lot/ like I knew about it
everyone in our group talked
talking helped me know what to do

These comments reveal that many children found helpful the opportunities for talking about what they were learning, and listening to what others said. They also reveal a surprising sophistication about language itself. The students appear to have quite clear ideas about the differences between speech and writing. They indicate some understanding at a metalinguistic level of the increased decontextualisation of written language: *when you're writing you have to make the people. . you have to let the people understand what you're writing and when you're doing something they could 'see what you're doing. . . what you mean.* They are aware of how a lack of immediate feedback makes written language more complex: *when someone didn't understand you got to ask them what does it mean/ that's how it's [spoken language] easier.* And they are aware of the way that written language must therefore create a fuller context for the audience: *when you're writing you need more detail than . . . when you're speaking.* One student also comments that writing is easier *because we learned about it a lot, like I knew about it,* supporting the arguments of those who assert the importance of building up the field prior to beginning to write (Hammond 1992).

PART 3: SLA INSIGHTS — SOME INSTANTIATIONS IN THE DISCOURSE OF THE CLASSROOMS

To summarise this chapter, key SLA insights are now reconsidered with specific reference to examples of their instantiation within the two classrooms. While it cannot of course be claimed that a particular teaching strategy will always result, for example, in comprehensible input, output, negotiation or noticing, this section of the chapter shows what these constructs 'look like' in the discourse of the classroom. It provides a pedagogical perspective on some of these more well-accepted SLA findings, and gives some clear indications about the kinds of pedagogical practices and classroom discourse that appear likely to support second language learning in a school context. The section concludes that an explanation of second language learning in terms of the 'conduit' metaphor of

communication discussed in Chapter 2 is ultimately reductionist in that it fails to take into account the socially situated nature of learning, and the collaborative nature of meaning making.

Comprehensible input

A number of strategies and teaching processes can be identified which were aimed at making teachers' discourse comprehensible to students.

Students were given multiple access to meaning through 'message redundancy', that is, through the integration of a range of semiotic resources, which frequently included gesture, demonstration and spoken and written modes, at the same time involving field and mode shifting between familiar and less familiar language. Teachers used demonstration and gesture as they talked, often alternating between exophoric and textual reference when referring to key lexical items, and between physical demonstration and verbal explanation in referring to key processes. This message redundancy was particularly evident at those times when it was important that meanings were made explicit, (for example when tasks were being set up), and following the practical tasks, (when children were helped to recontextualise understandings). Teachers also highlighted significant language items and lexis, through repetition of items within a single turn; through particular stress and intonation patterns, for example the 'pregnant pause' before a significant and newly introduced lexical item; and through interactional strategies such as cued elicitation.

Significant information and particular language items were regularly recycled, with many opportunities for recapping and summarising of jointly constructed information, for example at the start of each lesson, when students were asked what they had learned. Students were also often asked to repeat instructions for tasks. Such recapping opportunities not only provided a second chance for students to hear what may not have been fully understood previously, but also for the student who was responding to reflect on and clarify their own learning or understanding.

In teaching new language, teachers rarely introduced it in the early stages of new curriculum learning, preferring instead to encourage students to express understandings in familiar language before introducing them to more registrally appropriate language. Experiential work always preceded the use of this more decontextualised discourse, so that students were able to use these understandings as a basis for interpreting less familiar wordings. Thus the overall lesson planning

involved a movement *towards* the use of new language, rather than its early introduction and subsequent 'practice' as in the more conventional language classroom.

In their interactions with students, the teachers probed unclear responses and recounts, and through questioning encouraged students to take account of listeners' needs, that is, to include adequate information for their accounts to be comprehensible to their listeners. Often this involved focusing on the intended referent in clauses like *it went up*, in order to clarify with the student the key participants within the discourse, (for example: *what went up?*). In the process of these interactions new language items were introduced through teachers recasting of students' wordings. Such recontextualised meanings were therefore heard in the context of what students were attempting to say, and thus likely to be comprehensible to the student. If comprehensibility is understood in this way, as allowing the possibility for new meanings to be related to old, then the notion of comprehension must be extended to include the notions of 'given' and 'new' discussed earlier in this chapter: comprehension is facilitated when the 'given' is common to both interactants.

More complex tasks were often broken down into shorter sub-tasks. Thus when students were asked to write generalisations, a 'think-pair-share' process was adopted, with students first writing individually, and then being given opportunity to share this with a partner; often this was repeated with a second pair of students. The cognitive work that more complex tasks demanded was thus 'externalised' through the dialogue with others in the collaborative sharing process, representing an operationalisation of Vygotsky's notion of inner speech, and giving less able students increased time for comprehension.

Comprehensible output, stretched language

As earlier discussion has shown, this was most evident in teacher-guided reporting sessions when students were asked to report to others, findings which had become familiar to themselves. Representing as 'new' and unfamiliar (to others) what is 'given' and familiar (to oneself) may be a demanding task linguistically when it occurs in a different contextual situation, because it requires the speaker not simply to repeat information or action, but to transform it; in other words, to reconstruct action through discourse (here, through a verbal recount). Such reconstruction requires a substantial mode shift away from the context-embedded language of experiential work, towards more written-like and decontextualised discourse. The

change in deictic orientation which is involved, and the need therefore to articulate in the discourse those participants and processes which cannot be taken as 'assumed' knowledge on the part of the listeners, proved difficult for many students. Nevertheless the teacher guidance at these times usually resulted in students being able to carry out their verbal recounts, and thus provided occasions where, in linguistic terms, they were often operating at the outer limits of their second language competence. What is also important is that teacher-guided reporting provided authentic situational contexts for a 'press' to be placed on children's linguistic resources, that is, the need for comprehensible output was a function of the particular situational context, (unlike, for example, a functionally 'empty' drill where the same language 'patterns' might have occurred). The fact that comprehensible output was of functional relevance within this situational context, also addresses the theoretical claim that the notion of comprehensible output should incorporate registrally appropriate discourse as well as grammatical accuracy (Ellis 1994).

Comprehensible output was also a feature of occasions when small groups of students were 'rehearsing' for reporting to the whole class. These situations extended the notion of comprehensible output to the language of the group as a whole.

In these classrooms, the contexts in which comprehensible output from students could be observed, were also those where there was opportunity for considerable negotiation and interactional modifications between interactants. The examples suggest that comprehensible output is likely to be one of the results of negotiation, and that teaching tasks which by their nature lead to negotiation are therefore to be preferred to those that do not. Given the inherent inequality between the knowledge and language of teacher and student, interactions between them have the potential to lead to just this kind of negotiation, provided that the teacher is able to keep the discourse ongoing and 'open', and provides opportunities for students to produce extended discourse. I have discussed how teachers in this study achieved this, through the opening moves of each sequence and through increasing the prospectiveness of subsequent moves. Both these interactional strategies are likely to lead to longer and more complete utterances by students than is the case in the more traditional three part teaching exchange. What was referred to earlier, then, as a 'redistribution of labour' within the student-teacher discourse is thus closely related to opportunities for increased comprehensible output by students.

Negotiation and interactional modifications

It was suggested above that the inherently 'unequal' talk between teacher and students can, in the hands of a skilled teacher, create a context which produces interactional modifications and negotiation, but that this depends on the teacher creating opportunities for extended turns by students and not closing off exchanges too quickly. In considering 'negotiation' more closely, I begin by considering what it means for a teacher to negotiate in a classroom context.

Within the discourse there appear to be two motives for negotiation. One reason for negotiation, as might be expected, is to avoid communication breakdown, as in this example (7.26) between teacher and student where the teacher appears to be having some difficulty in understanding the student:

Text 7.26

	STUDENTS	TEACHER
2	L: if you put a nail . onto the piece of foil . . and then pick it . pick it up . . the magnet will . . . . . that if you put a . nail . under a piece of foil . and then pick . pick the foil up with the magnet . . still . still with the nail . . under it . . . it won't	
3		it what? (*looking puzzled*)
4	L: it won't/ it won't come out	
5		what won't come out?

Such examples point to the value of probing unclear utterances and taking time to uncover what students are attempting to say, not only because such negotiation is likely to increase curriculum understanding but because of the opportunities for more extended student talk that it creates.

However, many examples which appear similar can be interpreted somewhat differently, and suggest that there is a second motivation for negotiation which is pedagogically driven. Very frequently teachers are well aware of what students are trying to say, and their 'probes' serve a rather different purpose. In the following example (7.27), the teacher is aware of what the student is describing and her aim here appears to be to help the student to articulate more clearly what she is trying to say (that is, to produce more comprehensible output) and so also to provide an improved source of input for the listeners. The negotiation in this case is thus

pedagogically rather than communicatively motivated, a kind of 'pseudo-negotiation':

Text 7.27

	STUDENTS	TEACHER
4	J: we put paddle pops around the foam and then we got a magnet and we put it in . and we got another magnet and we put it on top but it wasn't touching the other magnet . and then when we turned it around . it attach together/ the two magnets . and when we put on the side they em attach together	
5		OK so when you say the first time/ you said that you put the magnet and it wasn't attached or it didn't attract to the other magnet/ what was happening/ at that time/ the first time . . you put the magnet in the cradle
6	J: it was em on the top of the other magnet/ it wasn't touching it...	
7	J: no	so was it just sitting on top of it directly on top?
8	J: it was just like on top of it like that *(demonstrating with her hands)*	
9		so it was like floating above it?/ OK that's interesting alright/ that's what happened the first/ tell us what you did then
10	J: we turned it around and they got stuck together	
11		so you turned/ which magnet did you turn around?
12	J: em the one that was on the top	
13		OK and then what happened
14	J: it touched it	
15		OK it attracted . . together . it attached together/ interesting OK/ let's hear what the other group did thanks Julianne

There are frequent examples of pedagogically-driven pseudo-negotiation of this type, which show the teacher *behaving as though* she fails to comprehend what the student is saying, although given her familiarity with what the children had been doing, this is unlikely. Such examples require us to consider again the nature of what contingent responsiveness means in a pedagogical setting. They suggest that in such instances the communicative intent of interaction is very different from

'natural' discourse. This particular difference between pedagogic and non-pedagogic discourse is not captured by an analysis of interactional structures alone (since the teacher behaves linguistically much as she might in a genuine breakdown of communication) but through an awareness of possible pedagogical motives. Such examples also point to the degree to which teaching itself can be regarded as a kind of performance, whereby interactions occur not solely for the benefit of interactants but also for the listeners: conversations are managed by the teacher, crafted with the knowledge, and often the intention, that they are to be overheard by others (the class in general). This of course does not lessen their value for language teaching. Indeed an explicit awareness of what kinds of moves are likely to increase opportunities for negotiation and for extended learner turns is likely to lead to a greater range of choices by teachers about how they respond to what students say.

Learner initiation of exchanges

Group work allows for learners to initiate topics and individual exchanges in ways which are less easily possible in the whole class situation. Learner initiation is harder to achieve in whole class situations, but it has been shown that teacher-guided reporting allowed for initiation of exchanges by learners. The opening moves by the teacher in many of the sequences that made up these episodes were significant in creating the discourse context for this to occur. These initiating moves were frequently in the form of an invitation to contribute rather than the more usual 'known-answer' question, as the following examples illustrate:

what did your group do?
are there other things that your groups did that are different?
what did your group come up with?
do you want to make a comment on that?
I want you to tell us what you found out
try to tell them what you learned
do you have anything to add to that?
tell us what happened
does anybody want to make any comment about that?
do you have any comment to make Hannah?
what were you going to say that your group found out?
Philip what did your group learn?
what do you know about magnets?
can anyone tell us anything we did on Monday
Charbel first tell us what was your experiment /what did you have to do?

does someone from this group want to give us the results . . Diana?
Fabiola would you like to report back to us
tell us what your results were
Julianne would you like to report back and tell us what your results were?
Diana's got something to say
can you tell me anything that you have learned about magnets so far?
Gabriella's group/ tell us what you did...Emily do you want to tell us?
what did your group come up with?
would you like to come and tell us about your experiment?
can anyone else who did that experiment tell us about their results?
tell us what happened
Duncan/ what did you do?
Diana's got something to share

As pointed out earlier, these moves by the teacher have in common the fact that responses to them cannot be prescripted by her, unlike an initiation move where a single answer is being sought (for example: *what happens when you put north with north?*). Certainly she has a good idea of the general topic areas the students are likely to talk about; however there is no single answer for which the teacher is seeking: what students said represented their own view of events. As Chapter 6 showed, both teachers drew on students' responses in the building up of the 'curriculum' view of the topic, recontextualising them within the framework of their own educational objectives. However from the learners' point of view, they were being given considerable freedom to talk about what interested them and what they saw as significant.

Freedom for learners to initiate exchanges is not enough; there must also be a finely-tuned response. The use of moves such as those in the examples above, demand the kinds of contingent responses already discussed in this chapter and in Chapter 6. Having created the conditions for more open discourse, teachers must then make spontaneous or 'real-time' decisions about how to build on the student's response in order to satisfy both the educational objectives, and the student's need for a response to their own meaning, a response which in addition must be comprehensible and at times provide some input for language learning. Perhaps the ability to make such multi-faceted responses is the hallmark of skilled second-language teaching.

Noticing

It has been suggested that the interactions between teacher and student in teacher-guided reporting episodes provided a context where 'noticing' appears likely. The provision of new wording often occurred in the same semantic context as a more 'everyday' equivalent, as a result of a recoding of student meaning. New language is thus introduced at points of student need at a time when students have some personal investment in attending to the new item[6]. New language is also introduced more formally as whole class instruction, but only after students have become familiar with the kind of propositional content in which it is embedded. Thus the learning of aspects of a new register proceeded on the basis of familiar understandings and everyday language, (a parallel principle to that in bilingual education when it is argued that the first language provides cognitive and conceptual support for the learning of a second; here though the issue is one of two registers rather than two languages). Such talk also frequently included discussion of the function of new language items. Both teachers alerted students to the notion of register, and to the need for the use of more decontextualised language in certain contexts, so that knowledge about language was constructed in the context of actual language use. This dual focus encapsulating both 'usage' and 'use', the bringing together of form and function, seems likely to increase the possibility that learners will attend to the new language.

Implications for SLA theory

The final section of this chapter suggests some implications of the previous discussion for SLA theory.

What becomes clear from the discussion is that notions such as 'comprehensible input', 'comprehensible output', 'negotiation', 'interactional modifications', and 'noticing' cannot be maintained as discrete constructs once they are examined within the context of authentic discourse. It has been argued, for example, that certain negotiation strategies, such as increasing the prospectiveness of the teacher's response move, lead to more comprehensible learner output and to more comprehensible input for listeners. Swain's studies in bilingual classrooms also suggests the discoursal relationship between theoretical constructs or metaphors.

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[6] Norton (1995) uses the term 'investment' in arguing that current conceptions of the 'individual' in SLA theory need to be reconceptualised. She views the language learner not as an ahistorical and unidimensional being but as having a complex social history and a multiple social identity which results in a sometimes ambivalent desire to speak the target language.

She shows for example how output can lead to noticing, and argues that learners' struggles in producing more comprehensible output is part of the process of second language learning: "is not something that leads to learning; it *is* learning" (Swain 1995b, p. 19). Summarising the nature of the collaborative work between two students she suggests:

> The metaphors of input and output — which focus our attention on the transmission of information — seem limited in describing the nature of their interaction. What the metaphors do not capture in this exchange is that through speaking, knowledge is being co-constructed.
> (Swain 1995b, p. 18)

The transcripts examined in this chapter, and in Chapters 5 and 6, support Swain's view, and illustrate the notion of classroom discourse as the joint construction of knowledge, and language learning as a social phenomenon. For this reason it would seem more appropriate to think of language learning in terms of language *development*, a construct which allows for the significance of an interactant in language learning, rather than of language *acquisition*, which suggests that the phenomenon of language learning is solely a mental process located within the learner.

Fundamental to such a social view of second language learning is the fact that the discourse itself cannot be examined in isolation from the social context in which it occurs; the need and motivation for negotiation, for example, arose out of the social context of the interaction and the fact that meanings were being constructed collaboratively by teacher and learners. The key issue here is the underlying theoretical framework for much SLA research. Within the 'conduit' metaphor of communication, discussed in Chapter 2, the implicit assumption is that the goal of communication is the successful sending and receiving of a message. Negotiation, defined from this perspective, is simply the means whereby this goal is attained. Arguing against this position, and for the critical role of social context in any examination of second language learning, Donato (1994) asserts that:

> framing the study of L2 interaction in the message model of communication masks fundamentally important mechanisms of L2 development and reduces the social setting to an opportunity for "input crunching". In the end, the social context is impoverished and undervalued as an area for truly collaborative acquisition. As Savignon

> (1991) points out, where meaning appears fixed, immutable, to be sent and received, what is lost is the collaborative nature of meaning making. (Donato 1994, p. 34)

A more fruitful line of enquiry, as Donato's words at the beginning of this chapter suggest, is one which is socially situated, and results from "studies of verbal interactions in which participants are observed in the process of structuring communicative events jointly". As previous chapters have shown, when the situated and negotiated nature of teaching and learning encounters is recognised, then learning can be recognised as a social rather than an individual endeavour: meanings are constructed between rather than within individuals and are shaped by the social activity in which they arise.

Once the unit of analysis becomes socially situated dialogue, then two key question emerge for those concerned with pedagogical issues in language teaching: first, what features of classroom dialogue are most enabling of second language learning, and second, in what social-situational contexts in the classroom are these dialogic patterns most likely to occur. It has already been argued that systemic functional grammar enables predictions to be made about the complex inter-relationships between specific situational and cultural contexts and the texts that are likely to occur in them. This chapter has attempted to show some of these relationships, and thus to suggest some of the pedagogical activities, and the interactional patterns by which they were realised, that are enabling of second language development.

CHAPTER 8

Conclusions

A summary of the issues

Chapters 5, 6 and 7 have each concluded with a number of implications. In this final chapter these conclusions are brought together to suggest a response to the issues raised in the introduction to this thesis (Chapter 1). Those issues are summarised here.

First, it was argued that the education of second language learners through the medium of the target language requires a pedagogy where language and content are integrated. A major aim of the thesis has been to explore how this integration can be theorised and operationalised. A particular focus for the study has been on the ways in which learners who have already mastered English in day-to-day contexts can be supported in the development of the academic and more written-like registers of school. Specifically, the study has aimed to identify discourse contexts for second language development which are both enabling of language learning and supportive of the learning of curriculum knowledge, and to explore the ways that classroom talk can be made more democratic and participatory for second language learners. This has required an examination of the role of the teacher and the problematising of notions of teacher-centredness and learner-centredness.

A further aim of the thesis has been to contribute to SLA research by broadening its focus, through exploring second language development as a phenomenon which interacts dynamically with the sociocultural context in which it occurs, and by taking a classroom-based, rather than classroom-oriented, approach to methodology.

Finally, it was also suggested that classroom-based research has the capacity to articulate teachers' intuitive understandings of teaching, and through this recontextualisation, to make this knowledge usable for professional development and training. Propositionalising the intuitive, it was suggested, can allow routinised behaviour to be reflected on, a process which can help to lay bare those points of leverage whose change may lead to new possibilities in classroom talk and ultimately in fundamental ways to the process of education itself.

The conclusions to this thesis will address each of these sets of issues.

Discourse contexts for second language learning

Major insights

The study has shown that in the classrooms which have been examined, one of the most significant contexts for second language development is what has been referred to as teacher-guided reporting. These episodes have been characterised as times when student-initiated meaning is recast or recontextualised by the teacher in ways which are closer to the more explicit discourse associated with written language, and which at the same time incorporate students' personal understandings within broader scientific principles. This recontextualisation is typically associated with mode and field shifts, and represents a linguistic 'bridge' between the context-embedded language accompanying the experiments, and the more explicit subject discourse which is less dependent on the immediate situational context. As the thesis has shown, teacher-guided reporting supported students in learning to use this more explicit and written-like language. As illustrated in Chapter 5, opportunities to use such language within an oral context helped students to become familiar with and begin to use the registers which are characteristic of the written texts of school subjects. Such literate talk provides a linguistic route to the kinds of written literacy which become increasingly important in later years of schooling.

Fundamental to the way in which these reporting sessions were set up was the existence of an information gap between different groups of students. This was critical in providing an authentic context for reporting, because all students became expert on a topic in ways not exactly shared by others. One of the classroom implications for this, and one of the practical ways for a teacher to work towards creating a more discursive and participatory classroom, is to set up learning activities which will lead to differential information between groups of students, or alternatively, to identify the areas in which individual students already hold some expertise. In this way, they, rather than the teacher, are on occasions the 'experts' in a particular field and can take on the role of 'knower' within the discourse. Such a situation, as the study has shown, holds the potential for some reversal of teacher-student roles and hence for modifications to their traditional role relationships and to teacher-student discourse.

Typically, talk in TGR episodes was realised by what were described in Chapter 4 as dialogic interactions. These interactions, while still broadly teacher-directed in terms of the overall topic and ultimate choice of what gets taken up in the

discourse, offer many opportunities for student initiation of meaning. Chapter 7 showed how, within dialogic interactions, more extended sequences where the 'feedback' turn is realised as a 'pivot' increase the prospectiveness of the move, and place a greater responsibility on the student to take on the role of conversational partner, and thus greater responsibility to clarify or extend their own meaning. Extended sequences therefore provide greater opportunities for comprehensible output and negotiation of meaning, especially when teachers' recasts are withheld until the student has had opportunity to produce output which is more comprehensible to others. At the same time, the recasting of the student's meaning by the teacher provides a source of comprehensible input for the learner, and access to the new register.

It can be argued that the kind of discourse which characterises teacher-guided reporting is not one which is underpinned by a transmission view of knowledge. The thesis has argued that knowledge itself should not be seen as a commodity which is transferred from teacher to student, but has shown how it is co-constructed through the joint contributions of interactants: both teacher and students together are responsible for the knowledge which gets constructed. Such a view of knowledge allows the dialogic as well as the unitary function of discourse to emerge. As the illustrative texts have shown, teachers frequently gave students opportunities to initiate meanings and to state their viewpoint to others, and while ultimately guiding students towards a particular view of what had occurred, they did so through a process of negotiation of meaning, and without recourse to heavily and overtly teacher-controlled discourse. As discussed in Chapter 7, these more dialogic contexts were also those where many opportunities for language development occurred.

It is a contention of this thesis, then, that where learners are developing curriculum knowledge through the medium of their second language, a view of learning as the co-construction of knowledge by both teacher and students, and thus the creation of classrooms where teachers encourage the dialogic function of discourse to emerge, *also* leads to the kind of teacher-student talk which is enabling of language development.

A further conclusion to emerge from this thesis is the existence within the discourse of a range of interactional patterns which tend to be used, as suggested in Chapter 6, for distinct pedagogical purposes. To claim pedagogical effectiveness for any particular teaching 'method', then, is to oversimplify the complex nature of classroom interaction. Rather, the evaluation of a particular interactional pattern

must take account of its particular pedagogical purpose at that point in the teaching sequence. A key issue appears to be how appropriate the 'fit' is between a particular interactional type and the educational purpose which the teacher is trying to achieve at the time. As the final texts in Chapter 6 showed, the effectiveness of a particular pattern (such as IRF) can only be understood and judged by interpreting it in the context of the long conversation of the classroom within which it occurs. Ultimately, judging the educational value of particular kinds of interaction depends upon taking account of the degree to which teacher guidance is required. Vygotsky's notion of the ZPD suggests that any evaluation of teacher-student talk must take account of how far a particular interaction provides the appropriate degree of scaffolding for students within a particular learning event. Thus an interactional pattern such as IRF, (critiqued, as discussed in Chapter 4, for a number of reasons, including the constraints it places on student talk), may be justifiable and indeed highly relevant in some contexts but not in others.

The study of the two classrooms also suggests that it is an oversimplification to refer to classrooms as 'open' or 'closed' or teacher- or learner-centred. It would for example be difficult to categorise either of the classrooms in this study in these terms, since at different points in the learning sequence of the curriculum cycle they took on the characteristics of very different teaching orientations. The recognition that different activities serve different pedagogical purposes, and thus that the role of the teacher correspondingly changes, also resolves the tension between teacher-centred approaches, which aim to transmit culturally valued knowledge, and progressive approaches, which are primarily concerned with the development of individual potential. As Wells (1995) points out in his description of a similar pedagogical sequence of activities, when students talk about what they have learned, their accounts refer to their personal actions and understandings, but at the same time the teachers share with them the existing cultural resources and relevant information to assist them in creating new meanings.

As van Lier (1996) has suggested, rather than attempt to categorise classrooms, it is more profitable to see classroom discourse as a map of interactional options from which teachers can select according to their purpose. An implication for professional development is that, rather than identifying with a particular interactional style, or 'following' a particular methodology, teachers need to see classroom talk as a potential resource which includes a range of interactional options, all of which may be relevant at some time. This study has illustrated what some of these options are and what pedagogical purposes they may serve.

The analysis of the illustrative texts has also shown both teachers and students as active participants, problematising the constructs of 'learning theory' and 'teaching method' as discrete notions. The data suggest the kind of reconceptualisation of pedagogy suggested by Mercer (1994), a 'theory of teaching-and-learning' which foregrounds the *relationship* between teaching and learning. Integral to this reconceptualisation is the Vygotskian notion of the ZPD and the related notion of scaffolding. The study suggests that scaffolded interactions are highly dependent for their effectiveness on the contingent nature of teacher responses to the contributions of their students.

What in general typifies the quality of contingency in the discourse is the alertness of the teacher to the ways in which student responses and current understandings can be built on for the purposes both of curriculum learning and language development. In the subject classroom there is a changing reality: events mean differently to students at different points as the study of the topic progresses. Magnetic repulsion, for example, is viewed by students from a personal and particular perspective during the experiments, but as a result of the guided reporting session that view begins to be incorporated within shared and generalised scientific principles. As Chapters 5 and 6 have shown, these different kinds of meanings are reflected in how students begin to talk and write about magnetism towards the end of the unit of work. At different points in an ongoing sequence of teaching and learning events, then, learners have a different sense of what and how things mean. It is perhaps the ability of the teacher to *recognise* how things mean to students at a particular point in time, and to be able to stand outside her own adult thematic framework and so to recognise students' current interpretations of events, that enables her to respond contingently to their contributions to the discourse. Contingency, then, rests in part on the teacher's ability to interpret the context and hear the discourse through the eyes and ears of her students.

As illustrated in Chapter 6, the 'fit' between teacher and student contributions is critical to the notion of contingency. Too close a match between teacher and student talk may suggest that the teacher is not tapping into the student's ZPD, and hence not extending the student's current understanding and language, but too great a gap may lead to the teacher's language not being sufficiently comprehensible, a gap which becomes greater when learners and teachers do not share the same first language. A recognition by the teacher of the degree to which students can be 'stretched' while at the same time maintaining comprehensibility, results in the sensitivity to pacing and to the needs of the individual students which characterise the nature of the scaffolding evident in much of the discourse. It is a conclusion of

this thesis that at the level of teacher-student discourse, such scaffolding results in the kind of collaborative talk which can be directly associated with curriculum learning, and with the kind of discourse most likely to provide opportunities for second language learning.

What has been discussed so far relates to aspects of the discourse itself, in particular its relationship to language development. However, a number of enabling factors indirectly impacted on the discourse, and these must also be taken into account here. These factors relate to the teachers' knowledge of linguistic theory, the degree of explicitness of the teaching, the learning sequence which underpinned the program and the intertextual nature of learning activities.

The relevance of theory

In the discussion of the classroom programs in Chapter 4, mention was made of the theories that had underpinned the planning of the programs, in particular, their underpinning by an explicit theory of language. One of the conclusions which can be drawn from the study is the importance of teachers recognising that 'content' is realised through 'language' and that there is a predictable relationship between a particular situational context and language use in that context. In this study this understanding by the two teachers resulted in a sequence of activities being designed which had a planned focus on the development of the target register. The sequence of activities themselves represented an operationalisation of the notion of the mode continuum, and resulted in a movement in the discourse from more to less context-embedded registers. As Chapters 5 and 6 showed, this sequence resulted in contexts in which learners developed and used the target register. A major conclusion that can be drawn from this study, then, is the importance of teachers having an explicit theory of language and understanding the curriculum in linguistic terms. This knowledge needs to be seen as essential to the design of ESL school programs which are concerned both with language development and with the development of curriculum knowledge.

An explicit curriculum

The thesis also illustrates the role of explicit teaching in the second language classroom. This explicitness took many forms. At one level it is reflected in the clarity of instructions given to students, particularly in that part of the curriculum sequence which I have referred to as *setting up the activity*. As Chapters 5 and 6 have shown, the teacher used a range of strategies to help make comprehensible the instructions for the activities which the students took part in. Such occasions,

however, not only helped ensure students knew what was expected of them, but, as Chapter 5 showed, were often also in themselves used as language teaching opportunities. Through mode and field shifts as they gave instructions, the teachers used such occasions as opportunities for introducing and teaching new lexical items and more written-like ways of meaning.

Expectations about the social behaviour of students were also made explicit. As Chapters 4 and 6 pointed out, discussion about 'how to be a student' took place on many occasions, but did not occur simply when the teacher had cause to admonish a student or to overtly control their behaviour (a relatively rare occurrence). Rather the social 'rules' of the classroom, such as the importance of working collaboratively, of respecting the contributions of others, and of recognising the consequences of one's actions, were explicitly taught and were thus an integral part of the common knowledge that was being built up. Making explicit the cultural values and behavioural boundaries of the classroom resulted, in these two classrooms, in a teaching environment where teachers managed learning rather than learners, and where little time was wasted on overt control of student behaviour. As SLA research indicates, and as this study strongly supports, students need many opportunities for interaction, but this presupposes a classroom environment where student-student talk can occur: if learners are unable or unwilling to work collaboratively, then even the best designed teaching activities are unlikely to be successful. The explicit teaching of the 'rules' of social behaviour is probably important in any classroom, but, as Delpit suggests, perhaps more so when not all students are familiar with the ways of learning valued by the dominant culture.

The shared understanding about the boundaries of classroom behaviour also had a more subtle effect, that is, upon the nature of teacher-student discourse patterns themselves. As the work of Cummins' and others suggests, interactions between teachers and students can never be neutral, and in the process of whatever 'instructional' function they may be serving they simultaneously construct how students are positioned as people and as learners. In these classrooms, perhaps because most students understood and in general followed the rules of classroom behaviour, teachers were able to use the range of more dialogic, and less controlling, interactional patterns discussed throughout this thesis and which ultimately led to the kinds of contexts which facilitate language learning. Certainly these contexts would have been far less varied and rich had teachers been more concerned with the overt control of students' behaviour. The analysis has shown that whilst more controlling patterns of discourse, such as IRF, did occur, they were used for specific *pedagogical* purposes, (such as checking that students had mastered a particular

language point), rather than, as Lemke and Mehan illustrate in their work, as a means to control behaviour. Somewhat ironically, then, it would seem that a program which includes as part of its aims the explicit teaching of classroom rules, can produce the kind of environment where classroom control is less overt, and thus where the student-teacher relationship can become one of learning rather than of control. This suggests perhaps that one of the factors which is critical in developing the kind of teacher-student relationships for which Cummins argues is the existence of some shared understandings about the social rules of the classroom. Teachers are then more likely to be 'freed up' from the business of keeping order and maintaining behaviour to use the interactional and less controlling discourse where, in Young's words, students are treated as persons in an educational relationship rather than as instructional objects (Young 1992).

The explicitness of the curriculum is also evident in the talk about language itself. The illustrative texts offer many examples of the teachers' use of metalanguage, particularly with regard to talk about the scientific register. Such talk occurred in the process of using language in the context of learning science, and was thereby integrated with the focus on science. Students were made aware that this way of talking and writing was not an arbitrary one, neither did it replace the more familiar ways of meaning. Rather it was an additional way of using language which had a particular purpose and function, a purpose clearly recognised by the student who wrote that she had "learned to talk like a scientist".

The significance of the learning sequence

The study has illustrated a teaching sequence where students begin a unit of work using their current language resources and move towards the target language (here the scientific register). Only after initial understandings were explored through familiar ways of talking were students introduced to aspects of the scientific register. This sequence parallels the principle of bilingual learning which suggests that learning should occur in L1 before it is transferred to L2. Here, though, the linguistic difference is not one of two languages but of two registers. As pointed out in Chapter 5, this learning sequence is very different from the traditional sequencing of many traditional EFL programs, which often begin with the teaching of the grammar and vocabulary which students will later be expected to use. Taking part in common experiences through the group work, and then sharing these experiences, helped build up an intersubjective agreement, Rommetveit's "shared social reality" (1985, p. 187), between students and teacher, and provided a common set of experiences upon which the teacher could base new language and new

understandings. The analysis has shown how within this shared intersubjective agreement new language was heard, interpreted and used. Thus in these classrooms, comprehensibility rested in part on what had gone before, on the previous parts of the 'shared story' upon which students could draw to help them interpret the present. As discussed in Chapters 6 and 7, this suggests that comprehensibility itself can in part be theorised by drawing on the constructs of 'given' and 'new', and that the way that the given and new information is structured in the classroom is integral to the degree to which new language will be comprehended.

What therefore appears to have been important for second language learning is the exploitation of the intertextual links between classroom activities, links which relate to the nature of the sequence of activities. Talk about what happened in the experiments in the TGR episodes grew out of the talk around the experiential work; talk about general scientific principles grew out of the personal recounts from the students in the TGR episodes; and student writing grew out of the talk around scientific principles. Conversely, there are 'traces' of earlier discourse in the discourse of later activities. As discussed in Chapter 7, it would seem that such intertextual links are far less likely to occur where language activities are clustered around a language structure or function, or sets of topically unrelated communicative activities. A further conclusion of this thesis, then, is that not only is it possible to integrate language and curriculum successfully, it seems that the nature of content-based language learning offers one particular advantage over the language lesson: namely that intertextual links occur authentically in the ongoing sequences of activities associated with the development of a curriculum topic. Learning activities thus have a socio-cultural character of their own: they are, in Widdowson's terms, context-creating rather than context-conforming (Widdowson 1992).

Contributions to SLA and implications for the field

In the introduction it was suggested that the SLA field would be enriched by the incorporation of more socially situated and classroom-based studies. This study has illustrated the potential insights into the teaching and learning process which are made possible by a broader notion of what constitutes SLA research. By viewing learning as a social process, it has shown how students' language learning cannot be analysed in isolation from the cultural and linguistic frameworks in which it occurs.

Chapter 7 showed how a close interpretive account of classroom discourse is able to more richly describe key SLA constructs such as comprehensible input, output, noticing and negotiation, and to theorise the ways in which these might occur in classroom discourse. In these classrooms, for example, the interpretive approach used has shown that comprehensible input was provided by the existence of multiple sources of meaning within a single situational context, for example the immediate visual situational context, alternate semiotic systems (such as graphs), the use of linguistic mode shifts by the teacher, and the existence of shared information which had been built up over a teaching sequence. The interpretation of the sequence of activities which the thesis illustrates has also provided a rationale for the balance between whole class work and small group work, (as suggested in Chapter 2, though a balance is argued for in the literature, a principled rationale as to how this is to be obtained is not specifically addressed). The analysis has shown that this rationale can be theorised both linguistically, (through the construct of the mode continuum), and in terms of neo-Vygotskian educational principles, (through taking account of the degree to which students are working within the 'upper limits' of their ZPD and thus the degree to which scaffolding is required).

The study has also illustrated how an ontogenetic approach to SLA classroom research can help show, even over a relatively short period of time, the relationship between particular interactions and language learning. Only by focusing on the unit of work, rather than the single lesson, or a single exchange, was it possible to show how the changes in the nature of the discourse, and the differential interactional roles played by the teacher, impacted on students' language and curriculum learning. The notion of the 'long conversation' was a particularly useful one, which also indicated how any particular text can only be interpreted within this larger discourse. It would appear likely, based on the experience of this study, that further SLA classroom-based studies would be a valuable source of information for defining the classroom factors, in particular the key aspects of the discourse, which are most likely to impact on the process of language learning, and to further describe those interactions which are potentially valuable in second language classrooms.

More fundamentally, the study has shown how the theorisation of practice itself can contribute to a theorisation of second language pedagogy in mainstream contexts. The study strongly supports those (van Lier 1994; Block 1996; Lantolf 1996) who argue for the potential of a closer relationship between second language acquisition theory and practice, and for the value of classroom-based, as opposed to classroom-oriented, research.

The point should also be made that the language model used throughout the study played a critical part in theorising this relationship. While the thesis did not purport to be a study 'in' linguistics, it nevertheless explored SLA constructs and issues using an explicit model of language, one which sees language as an integral part of its social and cultural context. Using a systemic functional model of grammar has allowed second language learning processes, and the contexts in which they occurred, to be described in linguistic terms, and thus has made it possible to suggest how such contexts can be replicated in similar settings. SFG informed not only the analysis itself, but also to a greater or lesser extent, the understandings of the two teachers about the relationship between language and curriculum content in their lessons. The study points to the value, indeed, for this thesis, the necessity, of approaching SLA research and pedagogy with a model of language which goes beyond a description of its phonology, morphology and syntax, one which allows for the study of discourse and for the study of language development in terms of socio-linguistic competence, defined, in this study, by the registers the learners must learn to control.

In relation to the particular type of learning context represented by this study, that is, the learning of the dominant language by second language learners in a school context, the point should also be made that a social view of second language learning is able to challenge what were described in Chapter 2 as 'deficit models'. A recognition of the critical role played by a learners' interactants shifts the way educational failure is construed, away from the notion of failure as the sole responsibility of the individual. The causes for lack of learning cannot be located unproblematically within individual students, their families or their linguistic and cultural backgrounds. The interpretation of the data in this study supports the notions of Mercer (1994), Cummins (1996) and others, that educational success or failure is in part the result of the kinds of interactions in which students have been engaged, and specifically, the degree to which their learning has been facilitated (or constrained) by the contributions of others. One of the clearest conclusions of the study is that how well students learn language, and the purposes for which they learn it, are largely the result of the social situations and contexts in which they have participated in interaction with others. The study in fact problematises what it means to 'acquire' language. Indeed the notion of language *acquisition*, suggesting learning as a personal and individualistic phenomenon, perhaps needs to be recontextualised as language *development*, which can be theorised as inclusive of both the learner and their interactive environment.

A more socially situated view of SLA also problematises the notion of 'context' itself. Probably the dominant view in the language teaching world is of context as a static back-drop or support for meaning (Goodwin and Duranti 1992), with the immediate spatial-temporal factors around the interaction being the primary focus of 'context'. As the analyses have shown however, 'context' is not constituted simply by these immediate factors, but also includes the shifting perspectives of the learners themselves; most importantly in this study, 'context' includes the long conversation of the classroom which develops over time. Previous parts of this long conversation are an integral part of the immediate discourse, and certainly in this study have been shown to be critical for language learning. One implication for SLA theory, and particularly for second language teaching in schools, is the need to recognise that learning involves the interpretation and production of meanings which for the learner are interrelated in a dynamic and changing context.

Equally problematic therefore is the notion of *decontextualisation*. This has been defined in linguistic terms, in Chapter 3, to refer to texts which are removed from the immediate situational, here-and-now context in which they occur. Taking account of the degree of decontextualisation, in this sense, has provided a valuable tool for analysis, and allowed for the data to be studied in ways which draw out their significance for language learning. However the term itself becomes problematic once a more dynamic view of context is taken. It has been argued, for example, that at *all* stages of the learning sequence, in the two classrooms observed, the discourse is highly contextualised *within the long conversation of the classroom.* Even language which has been described as more 'written-like' (hence more 'decontextualised' in the linguistic sense) is, within the dynamic view of context suggested here, no less 'contextualised' than that described as 'context-embedded'. The analysis has shown that even written-like registers can remain highly contextualised for the participants if they have also taken part in the discourse which has led to these registers. It must be recognised, therefore, that to claim a text as 'decontextualised' or 'less context dependent' presents some terminological tension in an educational study which also argues that the long conversation provides a dynamic context for the interpretation of discourse. Thus while the notion of *decontextualised,* in the linguistic sense it has been used throughout the study, has provided an essential tool for recognising degrees of spatial and temporal distance between events and texts, the theoretical tension suggests that some alternative terminology is required.

What can perhaps be concluded from this discussion, however, is that language is only truly 'decontextualised' in the classroom — and thus, for second language

learners, less likely to be useful for language learning — when important linguistic and cognitive links are not made explicit in the discourse, that is, when the long conversation is cut short. This may occur, for example, when teachers fail to make explicit the thematic links between their questions and students' responses, or between texts which students are expected to read or write and the spoken discourse of the lesson. Helping learners develop the more written-like registers of school, then, requires teachers to actively encourage the kind of sustained long conversations evident in these data, to ensure that a piece of discourse is always 'contextualised' in this more dynamic sense.

As was pointed out in Chapter 1, it was not my intention to provide a linguistic description of a pedagogy but rather to begin theorise a pedagogy. Insights from Vygotsky, educationalists working within a neo-Vygotskian framework, and pedagogical research around minority groups have each contributed, along with SLA research, to aspects of the analysis of the data. It was my assertion that observing the data from this multi-disciplinary range of perspectives would offer a more triangulated and richer theorisation of pedagogy. It is one of my conclusions that such an approach, which involves 'reading' one field of knowledge against another, has much to offer for pedagogical research in general, and for a theorisation of second language pedagogy in mainstream settings in particular.

Beyond the study

The findings of this study support Heap's claims regarding the value of articulating and theorising teachers' intuitive understandings and knowledge about practice (Heap 1995). In Chapter 1, I wrote that one of the aims of the thesis was to describe not only what is, the classrooms as they appeared to the researcher, but what can be, a pedagogy of possibility for minority students. While it was not the intention, and certainly neither do I wish to claim, that such a description is contained within the pages of this thesis, the study does point to one aspect of school where change may have far-reaching effects: what I referred to in Chapter 1 as a 'point of leverage'. A major finding of the study is that even minor changes of interactional patterns can have quite major effects on the progress of the discourse as a whole, and can make the difference between discourse which constrains or facilitates language development and learning. This finding supports the hypothesis suggested early in this thesis drawing on activity theory, which was later reiterated in the discussion of Cummins' work: that interactional change is necessary to bring about educational change, and that curriculum innovation can come about in the way educators and students interact with each other.

It is therefore an overall conclusion of this thesis that the "equitable and imaginative solutions which are required to respond to the needs of minority learners in mainstream classrooms" (Chapter 1) ultimately lie in the kind of discourse that teachers and learners are engaged in. Drawing an analogy with changing the rules of a game, and thus the game itself, van Lier argues that "deliberately manipulating and changing interactional structures in the classroom would ... change the rules of the pedagogical game in fundamental ways". While I would argue (and as the description of the school in Chapter 3 suggests) that if micro-level changes are not simply to remain localised, transformation and support at the macro-level of school and system policy must also occur, this thesis has focused on the possibilities of the micro. I conclude with further comments from van Lier, who continues:

> Starting by a close examination of interaction itself, and transforming it according to sound pedagogical principles, would necessarily (though not instantaneously) bring about a transformation of the institution itself. Reform thus occurs from the bottom up, one pedagogical action at a time.
> (Van Lier 1996, p. 158)

This thesis has examined in depth some of these "pedagogical actions" and concludes that it is here, in the particular ways that teachers choose to interact with their students, that a search for a more equitable education for minority children should begin.

APPENDICES

APPENDIX 1

Episode Summaries

Episode Summary: Classroom 1

Episode Summary: Classroom 2

Classroom 1

No.	HOW: Teaching/Learning processes	HOW: Dominant participant & interaction structures	HOW: Mode/degree of context embeddedness of discourse	WHAT: Knowledge constructed about science	WHAT: Knowledge constructed about language	WHAT: Knowledge constructed about identity/ how to be a student
1	**LESSON 1** **Introduction to Unit** T sets problem (how to get a pin out of a glass of water).	T/Class: IRF	Spoken.	Introduction to properties of magnets.		
2	**Discussion of problem.**	Pairs: Participatory	Spoken.			
3	**Sharing of solutions** Ss suggest solutions to class	T/Class: Dialogic	Spoken.			
4	**Sharing of prior knowledge of magnets**	T/Class: Dialogic	Spoken: reconstruction based on previous personal experiences. T writes up suggestions as concept map.	Prior knowledge: eg *Magnets can pick up things.* *Magnets don't stick to steel.*		
5	**Setting up new task** (to use magnets and a selection of magnetic and non-magnetic objects, find out something and record it.) Told they will report to class tomorrow.	T/Class: Monologue and IRF	Spoken: T gives instructions. Ss retell.	Magnetic and non-magnetic materials.		Reminder about group work, need to work together. T talks about listening behaviour and turn taking: *one person at a time.*
6	**Carrying out the task: doing the experiment** Testing whether objects are magnetic or non-magnetic, and recording results.	Group: Participatory	Spoken: context-embedded, language accompanying action	Magnetic and non-magnetic materials eg. *Magnets don't stick to money*		

Episode Summary 1

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
7	**LESSON 2** **Teacher-guided reporting**	T/Class: Dialogic	Spoken: reconstruction of personal experience.	Magnetic and non-magnetic materials. *Magnets are strong.* *They can attract through things.*		*We have a rule* (said when child interrupted the speaker). *Why didn't your hand go up to tell us?* (to child who had not heard previous speaker). *If you talk I can't hear.* *One person at a time.* *I only talk to people with their hand up.*
8	**Teaching new lexis** Teacher gives new lexis and focuses on form	T/Class: Monologue and IRF	Spoken: construction based on reconstruction of experience. Ss using more 'written-like' discourse, responses given as full sentences Written on board: *The magnets attracted/ didn't attract.*	Magnetic attraction.	Science lexis: *attract* Focus on tense *attracted/ this is yesterday.* T: *Say it in a sentence*	*Raise your hand when you have something to say.*
9	**Setting up new task** (language-based task, making generalisations about magnets.)	T/Class: Monologue IRF	Spoken: T gives examples of generalisations		S: *shouldn't it be past tense?*	
10	**Carrying out task** Making generalisations about magnets.	Groups: Participatory	Spoken : construction based on earlier reconstruction of experiences	Magnets don't attract all metals. It doesn't depend on the colour of the metal.		*One at a time* (spoken by students in group).
11	**LESSON 3** **Teacher-guided reporting** Reporting back of students ideas re generalisations.	T/class: Dialogic	Spoken: construction based on earlier reconstruction of personal experiences	Magnets don't attract all metals. Magnets only attract some metals.		T. to child calling out: *I love it when you have good things to say but not when you call out.*

Episode Summary 1

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
12	**Teaching new lexis**	T/ class: IRF	Spoken.	Meaning of *magnetic* and *non-magnetic.*	Science lexis: *magnetic, non-magnetic Magnets attract..... Magnets don't attract ...* Non-words (eg. *non-magnetic, non-toxic, non-fiction)* T. refers to *talking like scientists.*	
13	**LESSON 4** **Setting up new task (to test repulsion.)** T gives new lexis. T gives instruction.	T/Class: Monologue and IRF	Spoken: T gives instructions. Ss retell.		Science lexis: *north pole, south pole*	
14	**Carrying out task: doing experiment** Testing repulsion.	Groups: Participatory	Spoken: context-embedded, language accompanying action.	Like poles repel, unlike poles attract.	Science lexis: *repel*	
15	**Teaching new lexis**	T/class: IRF	Spoken	Like poles repel, unlike poles attract.	Science lexis: *repel*	
16	**Teacher-guided reporting**	T/Class: Dialogic	Spoken: reconstruction of personal experience			
17	**Making generalisations** Ss make generalisations based on matrix on board.	T/Class: IRF	Spoken: construction based on earlier reconstruction of personal experiences..	The north pole and the north pole repel. The south pole and the south pole repel. The north pole and the south pole attract.	T defines/explains meaning of *generalisation: something that will happen all the time/ not just what happened today.*	
18	**LESSON 5** **Teacher-guided reporting** (Continued from episode 16.) Discussion of George's experiments.	T/Class: Dialogic and Participatory	Spoken: context-embedded, language accompanying action.			

Episode Summary 1

	HOW			WHAT		
No.	Teaching/Learning processes	Dominant participant & interaction structures	Mode/degree of context embeddedness of discourse	Knowledge constructed about science	Knowledge constructed about language	Knowledge constructed about identity/ how to be a student
19	**Setting up new task** (journal writing)	T/Class IRF and Dialogic			Review of field lexis, and discussion of differences between speaking and writing. T refers to *writing like a scientist.*	
20	**Journal writing**	Individual	Written	Personal learning (what I have learned about magnets).		
21	**LESSON 6 Recap and Set up for new task** Testing strength of magnets	T/Class: Dialogic (recap) Monologue and IRF	Spoken: T. gives instructions. Ss retell.			Listening to each other.
22	**Carrying out task:: doing experiment** Comparing strengths of different magnets	Groups: Participatory	Spoken: context-embedded, language accompanying action.	The size of the magnet affect its strength.		
23	**Teacher-guided reporting**	T/Class: Dialogic	Spoken: reconstruction of personal experience.			
24	**LESSON 7 Review of what has been learned**	T/Class: Dialogic		Review of knowledge.		
25	**Setting up new task** (to test effect of magnets on iron filings; filings on paper, magnet held underneath.)	T/Class: Monologue IRF	Spoken: T gives instructions. Ss retell			Working collaboratively.
26	**Carrying out task: doing experiment** (effect of magnet on iron filings)	Group: Participatory	Spoken: context-embedded, language accompanying action.	Iron filings are magnetic. The position of the magnet affects the movement of the iron filings		

	HOW			WHAT		
No.	Teaching/Learning processes	Dominant participant & interaction structures	Mode/degree of context embeddedness of discourse	Knowledge constructed about science	Knowledge constructed about language	Knowledge constructed about identity/ how to be a student
27	Teacher-guided reporting	T/Class: Dialogic	Spoken: reconstruction of personal experience.	Magnets have a force field	Science lexis: *force field*	

Classroom 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
1	**LESSON 1** **Introduction to Unit** T talks about what students are going to do, elicits. S's prior knowledge of field.	T/Class: IRF	Spoken. Written on board: *What do you know about magnets.*	Prior knowledge eg fridge magnets for advertising.		
2	**Individual reflection** Ss write down what they already know.	Individual	Written: personal knowledge.	Prior knowledge. Ss suggest:*Magnets stick to metal. Magnets can stick on fridges. Magnets can stick to each other.*		
3	**Sharing of individual reflection** Ss exchange information with partner.	Pairs: Participatory	Spoken: talk based on written texts i.e written language spoken aloud.	Prior knowledge.		
4	**Setting up Concept Map** T models how to organise concept map, using Ss' ideas. T gives instructions to students about how to construct their own concept map.	T/Class: IRF and Dialogic	Spoken: Ss give ideas and T scribes (writes as students say, unedited) T gives instructions. Ss retell.	Prior knowledge: eg *Magnets have a forcefield. Magnets are used on fridges to stick notices.You can stick magnets on the fridge. Magnets stick to metal. Magnets are good for putting messages.*	Talk by T about *key words, how ideas go together, organising information.*	*Good that you were watching.* (Spoken when S. pointed out mistake T had made on the board.
5	**Constructing individual concept Maps** Ss organise personal knowledge using concept map.	Individual	Written: personal knowledge.	Prior knowledge: eg *Magnets can stick on fridges. I know that magnets can move things. I know about magnets that they stick to metal.*		
6	**Setting up for new task** (to share concept maps) T gives instructions and models sharing of individual concept maps.	T/Class: IRF	Spoken: T takes on role of students: *Let's pretend I'm working with M, I might say '.....'*			

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
7	**Explaining personal ideas to others** Ss share and justify their concept maps. T interupts pair work briefly: reminds Ss to ask each other questions, and gives instructions to make some generalisations about magnets based on what they already know.	Pairs: Participatory T/Class: Monologue	Spoken: based on what Ss have written.	*I attach 'stick' to 'powerful'.* *I put 'attach' and 'messages' because you can attach the magnet'.*	Ss asking each other for lexis: *What's that called?* S to group: *What we should do if we're going to make a generalisation on magnets we should start with the main idea.*	Ss refer to:*Your turn, Your go.*
8	**Teacher-guided reporting** Making generalisations. Ss share information gained in previous episode with whole class.	T/Class: Dialogic	Spoken: Ss reconstruct shared knowledge of group. T expands, rewords	Prior knowledge of the groups.		Listening behaviour. Listening to each other and not getting distracted.
9	**Student generated questions** Ss pose questions about what they would like to find out.	T/Class: Dialogic	Ss speak, T writes (their questions)	Prior knowledge of the groups.		Good listening behaviour. Importance of listening and concentrating for learning. T tells Ss that she doesn't know all the answers.
10 (i)	**LESSON 2** **Recap** teacher-guided reporting: talk about what happened last lesson (procedures and knowledge)	T/Class: Dialogic	Spoken by T + S: reconstruction of events of past lesson.	Prior knowledge of the groups.	*Classify means putting like ideas together* Science lexis: *attract*	

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
10 (ii)	**and** **Set-up for new task** (to find similarities and differences between differnt magnets) T gives instructions for task.	T/Class: Monologue	Spoken: context-embedded, language accompanying action. (T demonstrates with materials.)			
11 (i)	**Carrying out the task** Finding similarities and differences between different shaped magnets. T interupts groups to give instructions for sorting and recording	Groups: Participatory T/Class: Monologue and IRF	Spoken: context-embedded language accompanying action Spoken: T gives further instructions S retells instructions	Similarities and differences between magnets.		Listening behaviour. T refers to *sitting patiently when you've finished.* T refers to the *rule when sitting on the floor.*
11 (ii)	**Sorting small objects, and recording.** Ss sort objects (pin, needle, lid, coin, pasta, plastic lid etc) using own criteria, record how they group them.	Group: Participatory	Spoken: context-embedded language accompanying action Written: Ss record names of objects in each group		Ss asking each other for names of objects: *What are these called what does __ mean?* eg *split pin, thumb tack, pasta, pin.*	
12	**Setting up new task** T gives instructions for next activity	T/Class: Monologue and IRF	Spoken: context-embedded, T demonstrates using materials.	What objects will attract and what won't attract: magnetic and non-magnetic objects.	Meaning of *predict.* Language for predicting. Ss suggest: *I think, I suppose, my prediction is, maybe*	How to work in groups. Listening behaviour. Focussing attention on speakers. Cooperating.
13	**Carrying out task and predicting results** Ss predict which objects are magnetic, test predictions and record results.	Group: Participatory	Spoken: context-embedded, language accompanying action; large number of imperatives/ action exchanges.	Magnetic and non-magnetic objects.		

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
14	**Teacher-guided reporting** Ss report results of experiment to class.	T/Class: Dialogic	Spoken: reconstructing personal experience	Magnetic and non-magnetic objects.	Science lexis: *repel* Reminder from T to use *language we talked about* (re prediction)	Listening behaviour. Importance of listening. Should look at speaker.
15 (i)[1]	**LESSON 3** **Recap** T recaps on last class.	T/Class: Dialogic	Spoken: reconstructing personal experience			
15 (ii)	**and** **Set-up for new task** (Language-based task). T models and elicits generalisations based on reports in ep. 14.	T/Class IRF and Dialogic	Spoken T models more *written -like* spoken language. T writes on board Ss's suggestions for starting a generalisation.	Properties of magnets.	Meaning of *generalisation*. How to begin a generalisation. Suggestions from Ss: *all; some; most, many, the thing's name.*	
15 (iii)	**Oral rehearsal for writing activity** Ss share one generalisation with a partner.	Pairs: Participatory	Spoken: rehearsal for writing, written reconstruction based on previous experiences.	Properties of magnets.		
15 (iv)	**Set- up for new task** Language-based task, writing generalisations.	T/Class: Monologue and IRF	Spoken: T gives instructions. Ss retell. Ss ask questions about task.		Meaning of generalisation S: *do we write sentences?* S: *what is that word you speak?*	
16	**Writing generalisations**	Individual	Written: construction based on earlier reconstructions of personal experiences.	Properties of magnets.		

[1] In a small number of instances episodes are divided into sections, because they took place within a single space, on the mat in front of the teacher. In such cases the sections of the episode were generally much shorter than a full episode.

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
17	**Sharing written generalisations** Ss share individual generalisations with class.	T/Class: Dialogic and IRF	Spoken: construction based on earlier reconstructions of personal experiences.	Properties of magnets.	Joining two sentences with a connective.	Concentrating.
18	**Set up for new task** (finding out about behaviour of two magnets.) T gives instructions, referring to written instructions.	T/Class: Monologue	Spoken and Written: modeshifting, T demonstrates written instructions using concrete objects.		Science lexis: (based on written instructions) eg. *smooth surface, poles, alternating.*	How to work in groups: working collaboratively.
19	**Carrying out task** Doing experiment, finding out how two bar magnets behave.	Group: Participatory (T joins group) Dialogic	Spoken: context embedded, language accompanying action; large number of imperatives and action exchanges.	Magnetic attraction and repulsion.	S: *what's that called?*	Ss refer to *taking turns, your go.*
20	**Teacher-guided reporting** (about process of group work)	T/Class: Dialogic	Spoken: reconstruction of personal experiences.			What helps group work.
21	**LESSON 4** **Recap and Set up**	T/Class: Monologue	Spoken: T gives instructions. Ss retell.	Magnetic attraction and repulsion	T refers to*clear precise language, unpacking language.*	
22	**Recounting experiment and giving results** In groups Ss reflect on findings from ep. 19, a rehearsal for teacher-guided reporting.	Group: Participatory	Spoken: reconstruction of experience, (without concrete referents), a jointly constructed oral report.	Magnetic attraction and repulsion		
23 (i)	**Teacher-guided reporting**	T/Class: Dialogic	Spoken: reconstruction of personal experiences.			Listening behaviour.
23 (ii)	**Summarising findings and making generalisations**	T/Class: IRF	Spoken: construction based on earlier reconstructions of personal experiences.	Opposite poles attract. Like poles repel	Revision of science lexis.	

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
23 (iii)	**Setting up new task** (writing generalisations) Language-based task.	T/Class: Monologue and IRF	Spoken and Written: T writes key lexis on board, using suggestions from Ss. T gives instructions. Ss retell.	Opposite poles attract. Like poles repel.	Science lexis revised. Generalising. S asks *do we have to write in a sentence?*	
24	**Writing generalisations** In groups Ss write two statements	Group: Participatory	Spoken and Written: Ss write about their own experiment, and then about their overall learning.	Various - personal learning.	Spelling (Ss request spelling of some words).	
25	**Sharing writing with class**	T/Class: Dialogic	Written-spoken: Ss read aloud their writing from previous episode. T demonstrates with magnets as Ss are reading.	Opposites poles attract. Like poles repel.	How to write a generalisation. Revising how to write for an audience. T talks about *Making language more precise.* S uses *whereas*. T draws attention to this, refers to it as a connective. Revision of Science lexis	
26	**Writing** What Ss have learned so far.	Individual	Written	Various - personal learning		

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
27	**LESSON 5** **Recap** **and** **Set up for new task** (comparing north and south poles and presenting information on graph) T models how to construct graph.	T/Class: Dialogic T/Class: Monologue	Spoken: constructing generalisations. Spoken: modeshifting, T demonstrates written instructions using concrete objects, also referring to graph on board. T models role of Ss: *I might say ...*	Presenting information as a graph	Need to read instructions. Language for predicting: suggestions from Ss *it could be.* *my prediction is probably.*	Raising hand. Need for concentration.
28	**Carrying out task** Doing experiment, comparing different magnets, and both poles, to find out relative strengths. Information presented as a bar graph.	Group: Participatory	Spoken: context-embedded, language accompanying action.	Relative strength of poles, and relative strength of different magnets. Graphing information.		
29	**LESSON 6** **Recap** **and** **Set up for new task** (comparing relative strengths of different magents and of poles)	T/Class: Dialogic Monologue and IRF Monologue and IRF	Spoken: reconstruction of experience based on previous episode. Mode shifting, T demonstrates written instructions using concrete objects, also referring to graph on board.	Relative strength of poles, and relative strength of different magnets. Graphing information.	Lexis for graphing: *axis, vertical, horizontal.*	Need for concentration.

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
30	**Carrying out task** Doing experiment, comparing strengths of different magnets, and of each pole.	Group: Participatory	Spoken: context-embedded, language accompanying action.	Relative strength of poles, and relative strength of different magnets. Graphing information.		
31	**Teacher-guided reporting** Reporting of results from episodes 28 and 30.	T/Class: Dialogic IRF	Spoken: reconstruction of experiences based on previous episode. Construction of generalisations based on reconstructions.	Relative strength of poles, and relative strength of different magnets. Graphing information. (Note - Ss reach incorrect conclusions: *The north pole is stronger than the south pole..)*	T explains that when Ss are reporting, listeners should be able to *get a picture in your mind.*	
32	**LESSON 7** **Recap** (of four experiments in episodes 28 and 30) **and** **Set up for new task** (writing generalisations based on all experiments)	T/Class: Monologue Dialogic IRF	Spoken: reconstruction of personal experiences. Spoken: T refers to words on board (key lexis). T gives instructions. Ss retell.	T refers to *being true scientists, thinking and talking like scientists.* T refers to testing, getting results, making generalisations, generalising on basis of situations.	Science lexis. T refers to need for *clear language..*	Importance of. concentration
33	**Individual writing** Ss write generalisations based on all experiments	Individual	Written	Various - personal learning around properties of magnets.		
34	**Setting up new task** (to share generalisations)	T/Class: Monologue IRF	Spoken T gives instructions. Ss retell.	Various - personal learning around properties of magnets.	T models how to make a generalisation. Language should *get the message across, be expressed well.*	

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
35	**Sharing individual generalisations**	Pairs: Participatory T briefly joins each pair	Spoken: based on texts students have written.	Various - personal learning around properties of magnets.	Talk by T about language of generalising versus giving individual results. T tells students they need to *rework the language* Ss suggest sentence beginnings.	*S: What we have to do is* *S: Miss told us to .....*
36	**LESSON 8** **Recap** (of process of previous lesson, episodes 32-35) **and** **Set-up for new task** (pair and group writing task)	T/Class: IRF T/Class: Monologue and IRF	Spoken T gives instructions. Ss retell.	*thinking like scientists* *drawing conclusions*	General and particular statements. What a generalisation is, and why it is necessary in science.	*Listen if someone's speaking... learn from them.* Listening behaviour.
37	**Proofing written work** (Ss compare each others' generalisations and make suggestions for improvements, first in pairs and then in a group of four)	Pairs: Participatory Group: Participatory	Spoken: based on Ss' individual written texts. Spoken: based on pairs' written texts.	Various - personal learning around properties of magnets.	Particular and general statements. Ss talk about their writing e.g. *put an 's' on it.* T refers to need for accuracy because final product will be *public.*	

Episode Summary 2

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
38	**LESSON 9** **Recap** Review of process of last lesson (episodes 36-37)	T/Class: IRF	Spoken: reconstruction (of previous lesson).			
39	**Producing final product for classroom display** Ss write generalisations on large sheet of card.	Groups: Participatory		Various - personal learning around properties of magnets.		
40	**Preparation for teacher-guided reporting** Ss check generalisations and decide how they will present group display to class.	T/Class: Monologue Groups: Participatory	Spoken: T gives instructions. Spoken: Ss talk about their written texts (content and language).	Various - personal learning around properties of magnets.		Meaning of *negotiating*.
41	**Teacher-guided reporting.** Ss presents their generalisations.	T/Class Dialogic	Spoken: oral discussion of written texts.	Various - personal learning around properties of magnets.	T talks about making generalisations; proof-reading writing; generalising versus particularising. Discussion of wording of Ss' generalisations. Comments from T: *We're talking about the way the language is put together.*	

	HOW			WHAT		
No.	**Teaching/Learning processes**	**Dominant participant & interaction structures**	**Mode/degree of context embeddedness of discourse**	**Knowledge constructed about science**	**Knowledge constructed about language**	**Knowledge constructed about identity/ how to be a student**
42	**LESSON 10** **Set up for new task** (to design a game using magnets) T gives Ss instruction cards. Discussion of how to work in a group	T/Class IRF T/Class: Dialogic	Written and spoken: mode shifting T reads and 'unpacks' instructions. Spoken T illustrates each of Ss' ideas with likely wording: *One suggestion I have is*	Applying knowledge gained about properties of magnets, attraction and repulsion.	T refers to written instructions for task: *Specifications - what does that mean? Determine modifications and improvements - what does that mean?*	Working in a group: suggestions from T and Ss: *take turns; share ideas; communicate with the group; turn taking; quiet voices; making suggestions; coming to a decision when every members' idea is different.*
43	**Deciding on design for game**	Groups: Participatory T joins group: Dialogic	Spoken: construction of ideas: *we could; it could have.*	Revision and application of science knowledge.		
44	**Game made in craft lesson** *Researcher not present*					
45	**LESSON 11** **Groups present games to class**	Dialogic	Spoken: context-embedded as Ss demonstrate game; construction as Ss explain rules.	Revision and application of science knowledge.		Listening to groups carefully.

APPENDIX 2

Excerpts from Teaching Programs

Science and Technology Term 4 Overview

Science Objectives

Science and Technology Learning Experiences

Science and Technology

Term 4 Overview: Grade 4

Week	Topic	Concepts/Understandings	Skills
1			
2	STUCK ON YOU	• Magnetic • Non-magnetic	•brainstorming •classifying •generalising
3	~ Magnets~	• Polar attraction-like poles repel, unlike poles attract	• observing • predicting •generalising
4	Magnet strength	• Some areas of magnets are stronger than others. • Some magnets are stronger than others.	• graphing • generalising
5	Attraction through other materials	• Magnetic forces can pass through some materials	• generalising • observing
6	Design and make	• Some objects use magnetic force	• designing • evaluating
7	Reflection/Assessment	• Magnets attract some materials but not others	• generalising
8			
9			
10			

Values and Attitudes

For the chn to:
- work co-operatively
- value each others work/responses and provide constructive criticism

Science

Objectives

Knowledge

For the children to:

- identify what a magnet does
- recognise that different types of magnets have different strengths
- understand the difference between magnetic and non-magnetic

Skills

For the children to:

- brainstorm their knowledge of magnets
- classify various magnetic and non-magnetic materials
- make observations about polar attraction
- predict the results of investigations
- generalise the results of experiments
- design and make a game using magnets
- graph the results of an investigation.

Week 5	Science and Technology		Term 4
Objectives	**Learning Experiences**	**Language**	**Vocabulary**
For the chn to: -experiment to find out materials that magnetism will pass through -draw conclusions about magnetic attraction - clarify their understanding of magnets and magnetic attraction.	Lesson One • Review the experiments carried out during wk 4. • Ask chn to individually write generalisations resulting from experiments. • Chn share generalisations in pairs (add, combine, refine) • Pairs join with another pair (once again add to, combine, refine list of generalisations) • As a group, chn come up with one list of generalisations to share with the class. Lesson Two • Tchr presents 2 experiments to the class: 1. thumbtack in jar 2. Magnet and paper clips • Divide the class into 4 groups, 2 groups complete each experiment. Experiment 1 • Tchr drops a thumbtack in a jar of water (while chn are watching.) Ask chn to think of ways to get the pin out (they will have a selection of materials to choose from) without getting wet.	to generalise 'Magnetic forces ....' 'Magnetic forces will not...' 'Magnets are able to... **Resources** magnets glass jars paper paper clips pins rod foil wire	magnetic force attract magnetism repel pole **Evaluation**

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