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How to cite:

Littleton, Karen; Mercer, Neil; Dawes, Lyn; Wegerif, Rupert; Rowe, Denise and Sams, Claire (2005). Talking and thinking together at Key Stage 1. *Early Years: An International Journal of Research and Development*, 25(2) 167-182.

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Version: Accepted Manuscript

Link(s) to article on publisher's website:

<http://dx.doi.org/doi:10.1080/09575140500128129>

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Talking and Thinking Together at Key Stage 1

Karen Littleton, Neil Mercer, Lyn Dawes*, Rupert Wegerif**, Denise Rowe and Claire
Sams

Educational Dialogue Research Unit, The Open University, UK

*Faculty of Education, de Montfort University, UK

**Faculty of Education, Southampton University, UK

Keywords: Collaborative learning and problem-solving, Exploratory Talk, thinking
together

Authors' note:

The authors would like to thank the teachers and children who collaborated in this
work and the Esmée Fairbairn Foundation for funding it.

Correspondence to:

Karen Littleton or Neil Mercer, Faculty of Education and Language Studies, The Open
University, Milton Keynes, UK.

or

Rupert Wegerif, Faculty of Education, University of Southampton, Southampton, UK.

Talking and Thinking Together at Key Stage 1

Abstract

In this paper we describe an innovative approach to promoting effective classroom-based group work and the development of children's speaking and listening at Key Stage 1. This approach, known as *Thinking Together*, was initially developed for use with Key Stage 2 children. The work reported here explains how this approach has now been applied to the teaching of speaking and listening at Key Stage 1. The approach is founded on contemporary socio-cultural theory and research. At the heart of the *Thinking Together* approach is a concern to help children build and develop their knowledge and understanding together, through enabling them to practise and develop ways of reasoning with language.

Introduction

Whilst the study of children's collaborative group-work in school contexts has had a relatively brief history, there have nevertheless been substantial changes in the nature of the research being undertaken in relation to this issue. Initially, the primary aim was to determine whether and when working collaboratively was more effective than working alone (Dillenbourg, Baker, Blaye & O'Malley, 1995) and there is a substantial body of empirical evidence demonstrating that, whilst not inevitable, there are positive effects of social interaction for learning and problem-solving (e.g. Light, Littleton, Messer & Joiner, 1994; Teasley & Roschelle, 1993; Tudge & Rogoff, 1989). More recently, however, interest has shifted away from considering just the outcomes and products of collaborative work, towards analysing interactions as a means of gaining insight into the processes of collaborative learning and joint problem-solving. The aim of such analyses has often been to identify interactional features that are important for learning and cognitive change. Researchers with different theoretical backgrounds and different methodological approaches have emphasised different facets of interaction with some highlighting the important role of conflict, others planning, negotiation and so on (see Littleton & Light, 1999). Our own work in relation to this has highlighted the educational value of a particular kind of talk known as 'Exploratory Talk.'

The notion that Exploratory Talk might be educationally productive first arose for us in the context of the SLANT (Spoken Language and New Technology) project (for a review see Mercer, 1995; Mercer, 2000). This project investigated the nature of primary school children's talk when small groups were working together at the computer in classroom settings. Overall, 50 hours of classroom talk were recorded in ten English Key Stage 2 primary schools. A detailed analysis of the children's sessions of joint work revealed that three qualitatively different types of talk could be identified. These were characterised as Disputational, Cumulative and Exploratory Talk.

Disputational Talk is effectively unproductive disagreement, characterised by an initiation (e.g. proposition, hypothesis, instruction) followed by a challenge (be this a direct rejection or a counter proposition/hypothesis). Such challenges typically lack clear resolution or else result in resolution that is not supported by agreement. Sequence 1, illustrates this type of talk.

Sequence 1

- Carol: Just write in the next letter. "Did you have a nice English lesson"
(*Jo typing on computer*)
- Jo: You've got to get it on there. Yes that's you. Let's just have a look at that.
"Hi, Alan did you have a nice English lesson. Yes thank you, Yeah.
Yes thank you it was fine."
- Carol: You've got to let me get some in sometimes.
- Jo: You're typing.
- Carol: Well you can do some, go on.
- Jo: "Yes thank you"
- Carol: [Mumbles]
- Jo: You're typing. "Yes thank you" "I did, yeah, yes, thank you I did."
- Carol: You can spell that.
- Jo: Why don't you do it?
- Carol: No, because [you should].

In this sequence two girls, Carol and Jo, are working on a writing task at the computer. Their interaction is clearly characterised by initiations and challenges – there being disputes as to whose ideas should appear in the text and who should spell particular words.

In contrast to Disputational Talk, Cumulative Talk adds uncritically to what has gone before. Initiations are typically accepted either without discussion or with only superficial amendments. Sequence 2 below, in which Sally and Emma are working at the computer on a joint writing task, shows how Cumulative Talk is used to construct a common knowledge by accumulation. Cumulative discourse, such as that evident in Sequence 2, is characterised by repetitions, confirmations and elaboration.

Sequence 2

- Sally: Yeah. What if she says erm erm "All right, yeah." No, just put "Yeah all right."
No, no.
- Emma: (laughs) No. "Well I suppose I could..."
- Sally: "...spare 15p." Yeah?
- Emma: Yeah.
- Sally: "I suppose..."
- Emma: "I suppose I could spare 50p."
- Sally: "50p?"
- Emma: Yeah. "Spare 50 pence."
- Sally: "50 pence."
- Emma: "50 pence." And Angela says "That isn't enough I want to buy something else."
- Sally: Yeah, no no. "I want a drink as well you know I want some coke as well."
- Emma: "That isn't enough for bubble gum and some coke."
- Sally: Yeah, yeah.

In contrast, however, Exploratory Talk demonstrates the active joint engagement of the children with one another's ideas. Whilst initiations may be challenged and counter-challenged, appropriate justifications are articulated and alternative hypotheses offered. Where alternative accounts are offered they are developments of the initiation. Progress thus emerges from the joint acceptance of suggestions. We can see three girls, Kris, Fiona and Helen, talking like this in Sequence 3.

Sequence 3

- Kris: "I was only at the disco with Gemma"
Fiona: No.
Helen: No.
Helen: That's too um
Fiona: Outrageous! (*laughs*)
Helen: Yeah.
Kris: It's got to be really silly.
(*Brief interruption from some other children outside the group: the girls then resume.*)
Fiona: What can we say?
Helen: Um, what is a totally innocent place?
Fiona: The park?
Helen: No, it's late, remember?
Fiona: Oh yeah.
Kris: Yes, exactly.
Helen: It's dark.
Kris: Oh no, she's not the brainiest of people, is she?
Fiona: Where, where can it be? Um, um, no, she could be staying at school.

One of their fictional characters is a teenage girl, who has to explain to her angry father why she has stayed out so late. Here we can see talk which is more 'exploratory' – ideas are explicitly debated, requests for ideas and justifications for challenges are made, and alternative suggestions are offered. Compared with the other two types, in Exploratory Talk knowledge is made more publicly accountable and reasoning is more visible in the talk. Progress therefore emerges from the eventual joint agreement reached.

This conceptualisation of the different types of talk was generated by a theory of language and cognition which is essentially socio-cultural, and which identifies a developed capacity for the joint creation of knowledge between contemporaries and across generations, as a crucial and distinctive psychological characteristic of our species (Mercer, 1995). This theory incorporates a strong interpretation of the significance of *context*, which here means that we believe that talk which resembles any one of the three

types — Disputational, Cumulative, and Exploratory — may be socially appropriate and effective in some specific social contexts. But the theory also suggests that the kind of talk which (following Barnes & Todd, 1978; 1995) we call ‘Exploratory’ represents a *distinctive social mode of thinking* — a way of using language which is not only the embodiment of critical thinking, but which is also essential for successful participation in ‘educated’ communities of discourse (such as those associated with the practice of law, science, technology, the arts, business administration and politics). Of course, there is much more involved in participating in an educated discourse than using talk in an ‘exploratory’ way: the accumulated knowledge, the specialised vocabulary and other linguistic conventions of any particular discourse community have to be learned, and account has to be taken of members’ relative status and power. Moreover, such talk is essentially situated and context-sensitive, not ‘context-free’ or ‘de-contextualised’ as some (e.g. Donaldson, 1978, 1992; Wells, 1986) have suggested. There are limits on how explicit members of a discourse community need to be to make meanings clear: they can share new ideas explicitly enough to be effective by implicitly invoking the community’s shared knowledge and understanding. A key judgement made by effective communicators within a discourse is about what issues need to be made explicit to any particular audience on any particular occasion. Nevertheless, we maintain that the conception of Exploratory Talk embodies qualities that are a vital, basic part of many such educated discourses. ‘Exploratory talk’, in the sense that we use the term, is a communicative process for reasoning through talk in the context of some specific joint educational activity.

The educational implication of these ideas is that encouraging an awareness and use of Exploratory Talk may help learners develop communicative and intellectual habits that will serve them well across a range of different situations. Pupils should therefore be encouraged and enabled to practise Exploratory Talk in the classroom. There are, however, some difficult problems to be faced in transforming this proposal into educational practice. Barnes’ early advocacy of the educational importance of talk of an ‘exploratory’ kind (Barnes, 1976; Barnes & Todd, 1978) found official endorsement in British education, in the Bullock report (DES, 1975), through the National Oracy Project (Open University, 1991; Norman, 1992) and eventually in the orders for the National Curriculum (DFE, 1995). But studies of British primary classrooms indicate that children have very little opportunity to engage in open and questioning enquiry through talk (Bennett & Dunne, 1990; Galton & Williamson, 1992). One reason for this could be the

dilemma that teachers face in combining free and open discussions with their professional responsibility to teach a set curriculum. Another might be that the normal forms of discourse in classrooms do not encourage such discussion. Back in the 1980s, researchers as such as Wells (1986) commented that the normative environment for talk in most primary classrooms was not compatible with children's active and extended engagement in using language to construct knowledge. That is, as the managers of classroom discourse, teachers tended only to offer children opportunities for making brief responses to their questions – and so it was not very surprising that little extended reasoning through talk by children was observable in most classrooms. Although there have been some significant changes in British teachers' awareness of the importance of the development of 'speaking and listening' as an aspect of children's education, our own observations suggest that the situation has not changed to the extent one might expect. Our hypotheses in pursuing the research described here were therefore that (a) given more appropriate opportunities and guidance, even young children would be able to take a more active role in using talk to construct knowledge in class; and (b) for this to happen, teachers would need to organise a different environment for talk in their classrooms. We explain in later sections how these hypotheses have shaped the implementation of our research and the extent to which they have been supported by its findings.

The Social and Educational Role of Speaking and Listening

The role of the teacher in guiding students into explicitly rational discussions is a difficult one, and yet the importance of teaching and learning in relation to how to speak and listen in classroom contexts and how to make things happen through talk should not be under-estimated. For young children entering the new world of school, the primary classroom with its associated routines, rituals and discourses can be extremely confusing. What is expected in terms of behaviour may be accepted without really being understood. So while children may comply with a teacher's request to sit on the carpet, listen, answer questions, or even talk to other children about their work, they may not realise that such behaviour is intended to help develop their thinking. The distinction between structures for classroom management (for example, lining up in pairs or sitting rather than kneeling on the carpet) and structures which develop learning strategies (for example, listening to a partner or taking turns to ask a question) may not be apparent to

children. Furthermore, those children who, for a complex range of reasons, are already exhibiting a reluctance or reticence to co-operate, may be doubly disadvantaged — they resist attempts to help them ‘settle’ into a large group of their peers and also, unknowingly, curtail educational opportunities to talk to their classmates about the activities they are engaged in. The *Thinking Together* approach can help to overcome such problems. In primary schools, whilst there is a strong expectation that learners will work and talk together, it is rare that children are actually taught how to do this. We argue that unless children are helped to recognise the demands and expectations of classroom social organisation, their access to valuable learning opportunities will be curtailed or limited. Furthermore, it is our assertion that until: ‘children are able to use language as a resource for negotiation with others and as a means for establishing collaborative learning, the pattern of learning in the (primary) classroom remains inaccessible.’ (Jackson, 1987, p.85).

The *Thinking Together* Approach: Principles

The *Thinking Together* approach, from within which the *Talk box* materials described in the next section have developed, can be conceived of as an approach designed to help children understand patterns of learning in classroom contexts — thereby contributing to the processes involved in ‘making sense of school’. We aim to support and facilitate learners’ ‘sense-making’, by enabling all children to become active participants in their class’ community of enquiry and in the associated processes of knowledge construction. The *Thinking Together* approach (for details see Dawes, Mercer & Wegerif, 2000; www.thinkingtogether.org.uk) provides a framework for the direct teaching of the speaking and listening skills children need in order to learn from and with each other. In this way, learners can add educationally effective ways of talking and thinking together to their talk repertoire. Key features of the *Thinking Together* approach are:

1. Children follow a series of *Thinking Together* lessons. Aims for group talk are made explicit in the whole class introduction. During plenary sessions, groups reflect on the quality of their talk.
2. In these lessons, the class are directly taught speaking and listening skills (such as challenging with respect, reasoning, negotiating ideas) and are provided with contexts for collaboration in which they can apply such skills.

3. Classes create and agree on a shared set of ground rules for Exploratory Talk to use when working with one another in groups.

The approach thus supports children in ‘learning to collaborate’ as well as providing them with opportunities to ‘collaborate to learn’. The approach takes as its starting point young children’s capacities for interpersonal awareness, collaboration and inter-subjectivity and aims to facilitate the deployment of these capacities and discursive resources for schooled purposes. The approach also recognises that from a very early age children want to understand what it means to be a learner and what it means to do and succeed at educational tasks. Children form specific expectations and beliefs about teaching and learning relationships and ‘are motivated to understand the social rules and relationships of their cultural world’ (Dunn, 1988, p.189) because they ‘need to get things done’ (Dunn, 1988, p.189) in classroom contexts. Teachers make a powerful contribution to the creation of contexts for learning in their classrooms and the ways in which they talk, act and structure classroom activities convey powerful messages regarding how learning and talking are to be done in such contexts. The pedagogy inherent in the *Thinking Together* approach is thus designed to enable children’s participation in ongoing learning conversations where opportunities for structured dialogue with peers are frequent and where ground rules for Exploratory Talk are modelled in the talk of the teacher. This is because, as Gee (2000, p.201-202) notes: ‘Any efficacious pedagogy must be a judicious mix of *immersion* in a community of practice and *overt focusing* and scaffolding from ‘masters’ or ‘more advanced peers’ who focus learners on the most fruitful sorts of patterns in their experience’.

Whilst a concern with promoting effective reasoning in talk sits at the heart of the *Thinking Together* approach, the programme is predicated on more than just cognitive accounts of how group-work works. The processes of knowledge construction that we aim to foster are inextricably interwoven with the construction of social understanding and the experience of being a pupil participating in the ongoing life of the classroom. Thus, whilst the *Thinking Together* approach is clearly concerned with promoting the guided construction of knowledge, it aims to do so through the creation of a positive culture of collaboration and community of enquiry in the classroom. Such a culture of collaboration is founded on mutual respect and trust amongst teachers and learners — such that learners feel able to take the risks inherent in opening up their thinking to their peer group (Underwood & Underwood, 1999). The emphasis on the importance of enquiry stresses the value of the critical consideration of a range of ideas, of discussion

and negotiation based on reasoning (Elbers & Streefland, 2000). The debate and discussion of ideas may at times involve dispute and disagreement, but this is undertaken in an environment in which personal criticism is clearly distinguished from the criticism of ideas.

Several evaluation studies designed to assess the efficacy of the approach have been conducted, both in primary schools in the UK (involving pupils at Key Stage 2) and in Mexico (Rojas-Drummond, Mercer & Dabrowski, 2001). These studies have shown that children who had been inducted into ways of talking and thinking together in groups, using the *Thinking Together* approach, used more Exploratory Talk (as indexed in part by their increased use of words like ‘I think...’ ‘because...’ and ‘why’...?) when working together to solve problems than children of similar backgrounds from matched ‘control’ schools (e.g. Mercer, Wegerif & Dawes, 1999). Moreover, not only did the children become more effective in using language for talking and thinking together, but children who had studied the series of *Thinking Together* lessons achieved better results on the tests of non-verbal reasoning (Raven’s Progressive Matrices) and in their understanding of curriculum subjects than those in the ‘control’ classes — even when working alone. This suggests that the ‘socialised speech’ of the children who studied the *Thinking Together* lessons had been ‘turned inward’ and so had contributed to the development of personal ways of thinking (Wegerif, Mercer & Dawes, 1999; Mercer, Littleton & Dawes, 2003). This finding substantiates the claims made by L.S. Vygotsky that intermental or *social* activity can promote intramental or *individual psychological* development: ‘The greatest change in children’s capacity to use language as a problem solving tool takes place [...] when socialised speech is *turned inward*; [...] language takes on an intrapersonal function in addition to its interpersonal use’ (Vygotsky, 1978, p. 27).

Evidence of the efficacy of the *Thinking Together* approach at Key Stage 2 has encouraged us to extend and adapt the approach for children at Key Stage 1, work which has been funded by the Esmée Fairbairn Foundation. In the Key Stage 1 *Talk Box* lessons children are inducted into ways of thinking and talking together early in their school careers – especially important given the suggestion that in the early years of schooling, academic performance is crucially dependent on social understanding and an awareness of how teaching and learning ‘is done’ in school contexts (Jackson, 1987).

Talk Box

The *Talk Box* materials, developed by Lyn Dawes, Claire Sams and the *Thinking Together* team (in collaboration with teachers and children in Key Stage 1 schools), have been specifically designed to support the teaching and learning of language and reasoning skills at Key Stage 1 (Dawes, Sams & The Thinking Together Team, in press). As in the Key Stage 2 *Thinking Together* lessons, *Talk Box* offers an approach to teaching children how to talk together more effectively when working in small groups. These discussion skills are built up through a combination of direct teaching, whole class discussion, group activities (during which the children work in mixed-ability, mixed-sex groups of three) and evaluative plenary sessions. *Talk Box* lessons follow the three part structure established by the National Literacy and Numeracy Strategies. Teaching and learning are based on visual and concrete resources and the associated activities require minimal reading and writing so that the children can concentrate on working on their talk skills — the lessons being explicitly designed to enable children to share information, articulate their opinions and ideas, give and ask for reasons and negotiate with one another to reach group decisions. The central part of each lesson is an activity for small groups in which it is essential that the children share their thinking through talk.

The lessons raise children's awareness of the power of talk, generating an understanding that group work, if it is done well, depends as much on high quality, educationally effective talk and joint reasoning as on curriculum learning. Teachers and children establish a classroom community where the sharing and critique of thoughts and ideas and the joint construction of knowledge is not just important but essential. In keeping with the *Thinking Together* approach, the *Talk Box* materials emphasise the importance of joint ground rules for talk and a range of strategies to help groups to work within such rules. Classes devise their own ground rules based on the understanding that: high quality speaking and listening is of great value in class; high quality speaking and listening is inclusive and respectful of opinions and ideas; all information is shared; reasons are requested and given and the group seeks to reach agreement. The children's ownership of the rules helps the groups to implement them. Additionally children also become aware of some of the advantages of group work. For example, they come to recognise that: listening to a range of ideas and comparing them can help everyone to come to a more reasoned decision; by learning how to think aloud together they are learning how to think clearly when working together and alone; helping others to learn is a way of coming to understand ideas; groups can generate shared memories, through talk, available for later recall; talk allows everyone to reflect on both what they have learned and how they learned it and they can often

do better working together than working alone. Opportunities to evaluate, and where necessary, revise the ground rules are provided regularly throughout the lessons.

The twelve talking and thinking lessons which make up *Talk Box* divide into two sections: Section A: lessons 1-5, concerned with basic talk skills and establishing the ground rules for talk; and Section B: lessons 6-12, which provide cross curricular contexts for thinking together. Each lesson begins with shared learning objectives to do with an aspect of speaking and listening such as asking questions, considering a range of ideas, or ensuring that all members of the group are asked to contribute. The lessons have ‘child speak’ success criteria designed to encourage children’s awareness of what is needed in order to have achieved the learning objectives; for example: ‘Your group will be able to give an example of a ‘why?’ question’ or, ‘Your group will be able to tell the class what you have agreed’. In addition, lessons 6 to 12 have curriculum related learning objectives for mathematics, ICT, citizenship, science, music, etc.

Evaluating *Talk Box*

Over the 2002-2003 academic year we worked with six teachers (and their learning support assistants and head-teachers) in three ‘target’ schools, who used the *Talk Box* lessons, and devised and taught their own additional talk lessons with Year 2 children. Throughout the year we undertook detailed observations of the processes of teaching and learning associated with use of the *Talk Box* materials. The reflections of teachers, language support assistants and head-teachers from participating schools were gathered via semi-structured interviews about their experiences of working with the *Talk Box*.

The semi-structured interviews revealed a strongly positive evaluation of the impact of the project, even in the one school in which the implementation had, due to staffing problems, been difficult. In particular, the interviews revealed a heightened awareness of the nature and functions of talk amongst participating teachers, and of the importance of improving children’s communication skills as a means for ensuring their successful participation in education. We found the positive responses of the head teachers particularly valuable because, although they had agreed to the project being carried out in their school, they were more detached from its implementation than the classroom teachers. One head teacher commented:

Now, I've done that lesson (on Florence Nightingale) with Y2 last year and it was very difficult getting questions from them; questions that you'd get information from. I did it with (a class in Y2) this year and it's incredible, the questioning – and I think it's really developed that skill of questioning. Because that's quite a difficult and mature skill to have, quite complex. In fact it was really interesting, because once we had watched the video and the children had asked the questions, when we came to learn about Florence Nightingale, because they had asked the right questions they were able to get so much more information.

This was echoed by another head teacher, who noted:

I was quite impressed with the way that they are working together ... they are listening to each other, taking turns and asking. They are working things out together where before - I have not noticed that. In those particular sessions (i.e. lessons observed) I have noticed that they have all been engaged in what they are doing.

She contrasted this with the previous state of affairs

Based on previous knowledge of these classes at this school I wouldn't have expected children to have the skills to enrol other members of the group who weren't engaged initially bringing in other children into what's happening not just ignoring them..... I wouldn't have expected to see so many children listening to each other involving each other actually even noticing that somebody else hasn't given any input and I think that I certainly haven't witnessed that any where else before.

This same head teacher reported that changes had also been reported by outside professionals who were experienced school visitors:

When we had our assessment, (part of the Healthy Schools initiative) the assessor actually commented on their ability as groups of Year 2 children to sit and listen to the conversation round the table as a group that they hadn't noticed in other schools. They were quite impressed with that.

Issues of social inclusion also figured prominently for the teachers and head teachers.

One head teacher from a target school with a high proportion of children with English as an additional language (EAL) made this observation of a group of children:

They didn't assume that what one child said was the answer. They were very keen to know what each individual child knew, and that was really good. In another group, within the same lesson, there was a child who has a statement, and again, the inclusion there was excellent. So I think it seems to work across, for all children, I suppose – special needs children, EAL children, the more able children,.....There's one little girl who's both EAL and special needs and to see her animated in a lesson is just wonderful.

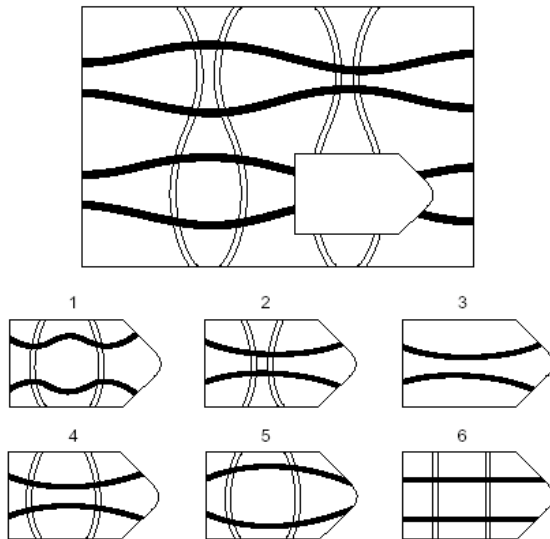
It would thus appear that for learners who might otherwise have found it difficult to contribute to group-based learning experiences, explicit discussion of ground rules for talking and working together has the potential to foster a positive, inclusive and supportive learning environment, based on mutual respect and trust. A detailed case study of the activities of this particular group is included below.

A case study: Nuresha, Vijay and Kyle

Nuresha was a child from a Bengali-speaking family in one of the target schools. Vijay had a similar background, though he was more fluent in English. Kyle was a native English speaker of local origin. When we made our initial video-recordings of the group working together on reasoning test problems, it was noticeable that Nuresha did not speak at all. On the recording she can be seen sitting well back from the table, while the other group members, Vijay and Kyle, work on the task. Sometimes she looks round the room, sometimes she plays with her ruler but she is completely disengaged from the group. The teacher introduces the group task and asks questions to check for understanding. She asks Nuresha several questions, such as: 'Do you agree, Nuresha? What do you think? Can you see why it's not number 3?' In response Nuresha nods. When the teacher leaves the group Vijay takes over the pencil and answer sheet. Kyle says it is his 'go' and a little later asks Nuresha if she wants a go. Nuresha shakes her head. Neither of the other children speak directly to her again during the rest of the sequence. The subsequent exchange between Kyle and Vijay involves disagreement over who should answer each question. There is no explanation of opinions or collaboration to work out the patterns in the puzzles. This is a kind of interaction that we have found quite frequently in pairs and groups in classrooms which can be described as 'disputational' talk. 'Extract 1: It's four not five' is a sample of the children's talk before the implementation of the programme. The group are working on a Ravens' Reasoning Test puzzle.

Figure 1: An example of a Raven's Reasoning Test Puzzle

Problem A



Extract 1: It's four not five

Kyle : It's four not five (*referring to the number of the puzzle*)

Vijay: We're on number five now, bogey. Look, we done number four, dumb brain. It's this one, isn't it?.

Kyle : No.

Vijay: It's this one isn't it?

Kyle : No,

Vijay: Yes

Kyle : No

Vijay: It's number 1.

Kyle : No, It's my turn to cross it off (*Attempts to take the pencil from Vijay who keeps it and marks number 1 on the answer sheet*)

(Kyle raises a fist to Vijay and Vijay runs away from the table saying 'don't hit me'.)

In this extract, the boys disagree without attempting to explain, provide reasons for opinions or seek each others' views. The competition between them is quite playful but is not productive from an educational point of view. Their main aim seems to be to assert or defend their individual ideas and there is no attempt to pursue the task collaboratively.

Soon after this extract was recorded, the implementation of the *Thinking Together* lessons began. The next recording we made of Nuresha was about half-way through the project in a whole class setting. In this session Nuresha is better engaged with the task and appears much more comfortable in the group. She speaks appropriately and confidently in response to a question from the teacher and takes part in class activities such as miming happiness to a partner.

In June 2003 we video-recorded Nuresha, Vijay and Kyle undertaking exactly the same problem-solving activity they had been engaged in the initial recording. This time the way that they worked together was quite different. The video shows all members of the group leaning forward to the table and frequently looking at each other as they pursue the task. Nuresha is involved throughout. They decide as a group that each should take turns at handling the task materials and ticking the answer sheet. The children remind one another of some the ground rules for talking that have been agreed in their class. 'Extract 2: Which one...' is a sample of the group talk. The children are working on the same Raven's Test puzzle as in Extract 1.

Extract 2: Which one...

Kyle: Which one ... (*to Nuresha*) You have to ask us which one we think. OK. You have to say "Kyle and Vijay, whose name, which one?"

Vijay: You have to say 'I don't want to do this' or 'Kyle, what do you think?'....say...

(And a little later)

Vijay: Next. Nuresha's getting the best ones, isn't she? You have to say 'what do you think, Vijay or Kyle?'

Nuresha: I think that (*number 2*)

Kyle: I think that (*number 4*)

Vijay: Nuresha, look.

Nuresha: I think, that, that, that.

Kyle: No, because, look, because that goes round. It goes out. It goes out.

Vijay: Or that one.
Kyle: No, because it hasn't got squiggly lines.
Vijay: It has to be that.
Vijay: OK num' 4.
Nuresha: Num' 4

In this extract Nuresha is much more involved in the group's shared reasoning. She is encouraged by the other two children, who are listening to one another and accepting alternative view points better. Nuresha suggests an alternative which challenges Kyle and Vijay, prompting Kyle to provide reasons why her suggestion may not be the correct answer to the puzzle. When the group converge on an answer, Nuresha affirms her participation by repeating the answer aloud, echoing Vijay. Nuresha speaks in total 26 times in this second recording. This is less than the others (Kyle 72 and Vijay 76) but is obviously significantly more than the pre-intervention session. She is involved in all the decisions that are made. She is asked one question in the pre-intervention session, but twenty-one in the corresponding post-intervention session. "What do you think?" is the commonest form of question, several times taking the form 'What do you think, Nuresha?'. All three children display a readiness to work together and an understanding of the importance of each individual contribution to the group's answer.

Key Words in Context Analysis

To provide a more general assessment of the effects of the intervention programme across all the classes, focal groups of three children within each class (who were selected by the teachers as being representative of that class) were video-recorded at the beginning and end of the school year working and talking together around a reasoning task (the task was kept the same so that changes in the talk of the group could be examined). We used a computer-based method for analysing changes in language use (Wegerif & Mercer, 1997) called Key Word in Context (KWIC). Using a concordancer (software for analysis of language) it is possible to identify and measure the rate of occurrence of items such as questions, pronouns, names and other key words. We looked at key words such as 'because', 'why', 'I think' which can indicate exploratory reasoning across all the transcripts. The changes in language use and in the way that children

interact, illustrated by the case study of Nuresha's group, were confirmed by this type of analysis. The results are summarised in Table 1.

Table 1: Key Word in Context (KWIC) analysis for the six target groups.

Key Words	Frequency Pre- Intervention September 2002	Frequency Post- Intervention June 2003
Because and 'cos (<i>used in explicit reasoning</i>)	9	36
I think (<i>used to introduce hypothesis</i>)	23	31
If (<i>used to reason about problems</i>)	2	13
Why (<i>task related questions</i>)	3	12
Which (<i>task related questions</i>)	9	21
What (<i>task related questions</i>)	15	21
You (<i>used in questions</i>)	31	144

It can be seen that use of key terms found to be important indicators of language being used to reason together and encourage the inclusion of other's perspectives increased over the period of the intervention in the target classes.

We undertook the same analysis in relation to the talk of three groups recorded in three control classes in schools who had not participated in the programme. The children's talk in the post-intervention period showed no similar pattern of change. The results are summarised in Table 2.

Table 2: Key Word in Context (KWIC) analysis for three control groups.

	Frequency Pre-intervention September 2002	Frequency Post-intervention June 2003
Because and 'cos (<i>used in explicit reasoning</i>)	15	21
I think (<i>used to introduce hypothesis</i>)	35	17
If (<i>used to reason about problems</i>)	0	7
Why (<i>task related questions</i>)	0	1
Which (<i>task related questions</i>)	12	2
What (<i>task related questions</i>)	8	7
You (<i>used in questions</i>)	5	11

In the control groups video-recorded there is no overall change in the use of those key terms found to be important indicators of language both being used to reason together and to encourage the inclusion of other's perspectives.

Summary and conclusion

In this paper we have described an integrated programme of work, based on socio-cultural theory and research, designed to develop, support and sustain an effective culture of collaboration and lively discourse communities in primary school classrooms. The work described places particular emphasis on facilitating the children's use of educationally effective talk. Facilitating discourse for the purpose of building understanding is important as it: "goes to the heart of the ...learning experience. Facilitating discourse recognises the role of the community of enquiry as enabling and encouraging the construction of personal meaning as well as shaping and confirming mutual understanding. This element represents the fusion of purpose, process and outcome. It is where interest, engagement and learning converge" (Garrison & Anderson, 2003, p.68). We argue that it is important to help children learn how to interact in classroom contexts — because it is possible that *how* a learner engages and interacts with others may potentially have a more profound and enduring impact on their circumstances than the acquisition of a better understanding of (for example) concepts

associated with mathematics or science. We thus suggest that careful consideration needs to be given to how children are inducted into ways of working together, and that this should involve careful attention to the generation and the establishment of jointly constructed and mutually agreed 'ground-rules'. More specifically, primary age children are commonly and usefully expected to work with one another in small groups in order to support one another's learning. For this purpose, they need a shared set of ground rules for talk. They require an awareness of the use of talk as a tool for thinking together, and an explicit knowledge of the speaking and listening skills which will help them to establish and sustain focused collaborative conversations.

Much of the research investigating children's group work, including our own, has focused on understanding the ways in which children talk and work together in groups. Relatively little work has been undertaken to investigate effective teacher strategies for promoting effective groupwork. Our recent work with Key Stage 2 children (Dawes & Sams, 2004) indicates that children's development of discussion skills is strongly dependent on the teacher's use of exploratory language, particularly open questioning and an emphasis on reasoning and changing one's mind if a good reason is proffered. Dawes and Sams (2004) indicate the value of teacher strategies which emphasise, teach and sustain collaboration during each of the three sections of the *Thinking Together* lessons. They argue: (a) that to be effective, the whole class introduction needs to be used to establish a shared understanding of the importance of group collaboration, and to share prior joint experience; (b) timely intervention in group talk helps to ensure that all are included, that difficult moments are overcome and that the talk remains focused on the activity in hand and (c) the closing whole class plenary can allow opportunities for sharing of ideas, and for reflection on the effectiveness of the group. Groups can also share positive examples to illustrate how their talk contributed to their thinking. Our future work at Key Stage 1 will further investigate the nature of effective teaching strategies for promoting speaking and listening skills, with a particular emphasis on understanding those strategies of particular value in work with early years children. As it stands, however, the work reported here suggests that the social processes that shape learning are powerful in their effects. The harnessing of these processes to support children's learning holds the key to enabling children to engage sociably and effectively with their classmates, to benefit from reasoned dialogue with their teacher and peers, and ultimately to understand themselves as the essential contributor to their own learning.

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