Throughout history, schools have been characterized by a transmissionary mode of instruction, with teachers showing and telling students what they should know and then testing them to ensure that they have learned it (Cole, 1996) and, as surveys show, this mode of instruction is still the norm in most classrooms (Galton, Simon et al., 1980; Goodlad, 1984; Nystrand & Gamoran, 1991). Outside school, however, this is not how people learn (Resnick, 1987). As research in a variety of disciplines has shown, coming to know involves a much more active participation by learners, in which they construct and progressively improve their understanding through exploratory transactions with the cultural world around them (Brown et al., 2000). An overriding question for educators, therefore, is how to provide such learning opportunities in classrooms.

Since most transactions in school take place through linguistic interaction, it seems clear that it is with the quality of classroom discourse that we need to start. Typically, and particularly when the whole class is involved, this takes the form of a three-part exchange, in which the teacher asks a question, a student is selected to answer, and the teacher evaluates the student’s response. Known as Initiation-Response-Evaluation (I-R-E) (Mehan, 1979), this pattern can continue over many exchanges with little connection between them. This “recitation script” has been criticized from several points of view: it disadvantages children from cultures in which this form of interaction is uncommon (Heath, 1983; Tharp & Gallimore, 1988); it provides no bridge from everyday registers to those in which disciplinal knowledge is constructed (Lemke, 1990); and it provides little, or no opportunity for students to voice their own ideas or comment on those of others (Wood, 1992). However, following Barnes’s (1976) suggestion of treating talk as a site for exploration rather than simply for evaluation, a number
of recent studies have begun to investigate the possibilities of making classroom interaction more dialogic (e.g. Gibbons, 2002; Nystrand, 1997; Wells, 1999).

Starting in 1991, a group of educators in Toronto came together to explore ways of creating classroom communities in which inquiry would provide the stimulus for dialogue. Consisting of classroom teachers and university researchers, the group engaged in collaborative action research over almost a decade. In brief, what we found is that, even when the prevailing discourse structure has the form of triadic dialogue, classrooms can be places in which knowledge is dialogically co-constructed. The purpose of this paper, then, is to report some of the findings from this study and then to consider three further questions: What does productive dialogue look like? Under what conditions is it most likely to occur? What role(s) does the teacher need to play to promote and sustain it? First, however, we need to explain why we believe dialogue to be so important.

**The Role of Dialogue in Activity**

In making the case for dialogic inquiry, my colleagues and I have drawn upon our understanding of cultural historical activity theory (CHAT) and, in particular, on Vygotsky's (1981) premise that it is semiotically-mediated joint activity that has impelled what is specifically human about the development both of our species and of the different cultural groups that have emerged over the course of human history. Motivated by the drive to sustain and improve the human condition, joint activity has been and continues to be the arena in which knowledge is constructed and reconstructed, as both outcome of, and the mediating means for, the solving of the problems that inevitably arise in the course of goal-oriented activity. In this process, Vygotsky argued, language plays a key role, providing the means both for coordinating action and for thinking together. Not surprisingly, therefore, he also saw language as central in the development of humans’ “higher mental functions,” both at the level of individual development and in the cumulative creation and improvement of the technologies, arts and institutions that characterize human cultures.

But how exactly does language come to play this central role? It was certainly not available from the beginning. Both phylogenetically and ontogenetically, intentional collaborative action emerges prior to the initial stages of specifically linguistic development. As Tomasello et al. (in press) argue:
Language is not basic, it is derived. It rests on the same underlying cognitive and social skills that lead infants to point to things and show things to other people declaratively and informatively, in a way that other primates do not do, and that lead them to engage in collaborative and joint attentional activities with others of a kind that are also unique among primates. The general question is: what is language if not a set of coordination devices for directing the attention of others? What could it mean to say that language is responsible for understanding and sharing intentions, when in fact the idea of linguistic communication without these underlying skills is incoherent.

In the last thirty years, a substantial body of research has shown that, before the child’s first attempts at communicating through speech early in the second year, there is ample evidence that infants (like other higher primates) are able to read the intentions of others and that they are also able to engage in dyadic interactions with others in which they first share emotions (‘primary intersubjectivity’ (Trevarthen, 1979) and then attention to and interest in objects and events external to the dyad (‘secondary intersubjectivity’ (Trevarthen, 1978). Then, early in the second year, these lines of development come together in collaborative action, which involves both shared intentional behavior and reciprocal role-taking in ‘protoconversation’ about their joint actions. And from these arise what Tomasello et al. (in press) call “dialogic cognitive representations”.

Dialogic cognitive representations are necessary not only for supporting certain forms of collaborative interactions on-line, but they are also necessary for the creation and use of certain kinds of cultural artifacts, most importantly linguistic and other kinds of symbols, which are socially constituted and bi-directional.

It is these dialogic cognitive representations, then, that are communicated in children’s first semiotically-based communicative acts. They are also the way into language. For example, as Halliday (1975) noted, the first functions to emerge in Nigel’s protolanguage were “instrumental” (to obtain goods and services), “regulatory” (to influence the behavior of others), and “interactional” (to maintain emotional ties with those closest to him).
Thus, the main point that emerges from this consideration of early language and its precursors is that, phylogenetically, language emerged as a tool - a functionally-based system of communication -- that enabled its users to achieve more effectively, and to diversify, the sorts of joint actions that they were already able to perform in a rudimentary way without it. And from an ontogenetic perspective, since every child is born into a community in which language use is already highly developed, in appropriating the language encountered in interaction with others, she or he takes over and transforms for his or her own uses the purposes and mediational means of the wide variety of joint activities in which contemporary humans participate. It is in this sense, then, that language is the “tool of tools” both in the development of individuals’ abilities to participate effectively as members of their communities and simultaneously in the development of those communities through their members’ participation (Lave and Wenger, 1991).

**Dialogue: Intersubjectivity and the Negotiation of Perspectives**

One of the characteristics of linguistic communication is that it is almost always potentially ambiguous. The major reason for this is that, in use, words do not convey a fixed meaning but, rather, are imbued with the speaker’s meaning, which is based on his or her perspective on the topic under discussion. Even when attending to the same object, interactants interpret it from different perspectives as a result of their previous experience and current concerns. This means that, for dialogue to proceed satisfactorily, participants have to make a persistent attempt to understand each other’s perspectives -- to achieve a state of “intersubjectivity.”

In fact, paradoxically, as Rommetveit (1985) points out, “intersubjectivity must in some sense be taken for granted to be attained”, p. 189). For when two or more people engage in dialogue they both assume that the other(s) will enter into and honor a kind of contract to alternate between two roles, which Rommetveit explains as follows.

States of intersubjectivity are, in fact, contingent upon the fundamental dyadic constellation of speaker’s privilege and listener’s commitment: The speaker has the privilege to determine what is being referred to and/or meant, whereas the listener is
committed to make sense of what is said by temporarily adopting the speaker’s perspective. (p.190)

This reciprocity is essential for what he calls symmetric dialogue. But, of course, such perfect symmetry of intersubjectivity is rarely attained in practice, since speakers do not always take their listeners’ expectations sufficiently into account and listeners are not always able and/or willing to adopt the speaker’s perspective. When these failures of intersubjectivity happen, misunderstanding is likely to occur and, if this is not clarified in the subsequent discourse, there is likely to be a breakdown in the dialogue. This is rather clearly brought out by the following extract from a conversation between a two-year-old and his mother.

While his mother was attending to household chores, Mark was looking out of the window and noticed a man at work in his garden below.

Mark: A man- a man er- dig- down there.
Mother: A man walked down there?
Mark: Yeh.
Mother: Oh, yes.
Mark: Oh, yes.
[6-second pause]
A man's fire, Mummy.
Mother: Mm?
Mark: A man's fire.
Mother: Mummy's flower?
Mark: No.
Mother: What?
Mark: (emphasizing each word) Mummy, the man. fire.
Mother: Man's fire?
Mark: Yeh.
Mother: Oh, yes, the bonfire.
Mark: Bonfire. Oh, bonfire. bonfire. bon-a fire bo-bonfire.
Oh, hot, Mummy. Oh, hot. It hot. It hot.
Mother: Mm. It will burn, won't it?
Mark   Yeh . burn . it burn.

In the first sequence, Mark attempted to draw attention to the man’s activity of digging, but his mother misheard what he said. Because he was willing to accept his mother’s interpretation of his meaning intention as referring to the man walking, when she, not looking out of the window herself, simply acknowledged his observation, the exchange ground to a halt. On the other hand, a few seconds later, when she again misinterpreted his intention, Mark persisted until she understood. Then, by naming their joint focus of attention more precisely, she offered a different but related perspective of her own which prompted Mark, in turn, to add a further perspective, which led to a satisfying outcome for both (Wells, 1986).

However, what this brief conversational excerpt makes clear is that there is also a second paradoxical characteristic of dialogue. While intersubjectivity is continuously aimed for, turn by turn, it is the differences between interactants’ perspectives on the topic in successive turns that make a dialogue interesting and likely to continue. Nevertheless, for it to proceed in this way, the interactants must be willing and able to switch roles in a reciprocal manner, each proposing a topic that the other treats as the current focus of joint attention and as the basis for a relevantly related contribution of his or her own.

On this point, Bakhtin (1986) provides an important additional perspective. Noting that every utterance is a link in an unending chain of communication, he points out that, in contributing an utterance, a speaker both responds or reacts to previous utterances – “expresses [his] the speaker’s attitude toward others’ utterances and not just his attitude toward the object of his utterance” (p. 92, emphasis added) -- and addresses it to a particular audience from whom he expects a further response. And, viewed from the other side, listening (or reading) another’s utterance is equally active: “all real and integral understanding is actively responsive, and constitutes nothing other than the initial preparatory phase of a response (in whatever form it may be actualized).” To this he adds:

And the speaker himself is oriented precisely toward such an actively responsive understanding. He does not expect passive understanding that, so to speak, only
duplicates his own idea in someone else’s mind. Rather he expects response, agreement, sympathy, objection, execution, and so forth” (p. 69).

It might seem, then, that in Bakhtin’s conception of dialogue, intersubjectivity was ignored -- though we do not think this to be the case. However, it is very clear that of equal or greater significance for him was responsivity and the “interanimation of voices.” Disagreement was as much to be expected as agreement; but for either to be the stance taken in response, the listener had to be actively understanding as well as preparing his reply.

Writing in the same tradition, although somewhat later, Lotman (1988) proposed that there are two functions of a text (utterance, in Bakhtin’s usage). The first, which might be called “monologic” (Wertsch, 1991), assumes a coincidence of speaker’s meaning and listener’s interpretation (and, hence perfect intersubjectivity). However, useful though this may sometimes be for some purposes, it does not call for, or welcome, a responding utterance that offers an alternative perspective. In its second function, on the other hand, a text serves to generate new meanings. In this respect a text ceases to be a passive link in conveying some constant information between input (sender) and output (receiver). Whereas in the first case a difference between the message at the input and that at the output of an information circuit can occur only as a result of a defect in the communication channel, and is to be attributed to the technical imperfections of this system, in the second case such a difference is the very essence of the text’s function as ‘a thinking device.’ (pp. 36-37)

Similarly, in Bakhtin’s view, it is only the second function of a text that can be considered to be truly dialogic, for it is only when the transmissionary function is subordinated that there is the possibility for active responsiveness and the interanimation of voices (Wertsch, 1991).

**Monologic and Dialogic Interaction in the Classroom**

Lotman’s (1988) distinction between the two functions of text is clearly very relevant to the talk that goes on in classrooms. While he clearly places greater value on the second, “dialogic”,
function, he does not discount the monologic function, with its aim “to convey meanings adequately” (p.34). As he explains, the monologic function is important for passing on cultural meanings, “providing a common memory for the group” (p. 35), thus preserving continuity and stability of beliefs and values within a culture. By the same token, however, a text treated in this way is by nature authoritative, not open to question or alternative perspectives. A further drawback is that, in this transmissionary model of communication, although intersubjectivity is assumed, it cannot be guaranteed, since there is no opportunity for misunderstandings or misinterpretations by the receiver(s) -- which inevitably arise -- to be corrected.

It is for this reason that Lotman, like Bakhtin, sees the dialogic function of text as being more important. As Bakhtin emphasizes, to understand a text/utterance is to begin to respond to it from the receiver’s perspective. And, as these alternative perspectives are brought into dialogue with each other, the text does indeed function as “a thinking device”, as Lotman put it, and as “a generator of new meanings.” Emphasizing this function thus encourages innovation and originality. However, for this very reason, there is no guarantee that the new meanings generated will be entirely compatible with those assumed by the authoritative, monologic, function. On some occasions the new meanings may seem unwarranted, though this can be argued out in the ensuing dialogue. On other occasions, however, the new meanings may open up new possibilities that warrant further exploration. In either case, however, the value of adopting the dialogic function is that it is inclusive of alternative perspectives and the interanimation of voices and leads to a deeper understanding of the topic by all concerned, whether or not the result is consensuses and perfect intersubjectivity.

Recognition of the reciprocity of these two functions can also be seen in Tomasello’s (1999) phylogenetic hypothesis concerning the cultural development of human cognition, in which he proposed what he called “the ratchet effect” to account for the cumulative nature of cultural evolution. As he pointed out, while “progress” depends on the creativeness of particular individuals or groups in inventing and improving cultural tools,

the process of cumulative cultural evolution requires not only creative invention but also, and just as importantly, faithful social transmission that can work as a ratchet to prevent slippage backward -- so that the newly invented artifact or practice preserves its
new and improved form at least somewhat faithfully until a further modification or improvement comes along. (p. 5)

While Tomasello was considering the early stages of cultural evolution in the above passage, the same argument clearly applies throughout history, as one generation succeeds another. Both continuity and innovation are necessary for a healthy society and for this purpose the texts of cultural knowledge need to be engaged with both monologically and dialogically.

What this suggests from the ontogenetic point of view of individual development is that each of us needs both to be enculturated into the knowledge and practices that are valued in our culture (the ratchet effect) and also to be encouraged to explore and propose alternative possibilities in order to “improve” the received knowledge and practices to make them more appropriate and effective for the present and the foreseeable future. Viewed from this point of view, then, the task of education, both in the family and community and in schools and colleges, is to provide opportunity and support for both these aspects of development. Or to put it differently, education requires both monologic and dialogic interaction between and among the members of successive generations.

For the vast majority of children there is no lack of monologic interaction, either at home or at school. This is not surprising, for it is clearly important for children’s present and future participation in their families and in the larger community that, with their greater expertise, adults provide the necessary opportunities for children to appropriate their community’s ways of acting, thinking and valuing and of the accepted ways of communicating their thoughts and feelings about their experiences. Together, these form the cultural resources that they need to master in order to become full members of their community. At school, too, there is much that students need to take over from previous generations, and monologic, direct instruction is sometimes the best way of providing the necessary opportunity for such learning (Wells, 1998). But, in the light of the preceding argument, monologic instruction alone is not sufficient. Not only do children not always understand what they are told and so need to engage in clarifying dialogue to reach the desired intersubjectivity, but frequently they have alternative perspectives on a topic that need to be brought into the arena of communication and
explored in more symmetric dialogue, in which there is reciprocity in the roles of speaker and listener and, equally, an attempt by each to understand the perspective of the other.

This certainly happens in the homes of almost all children – at least in Western societies -- as we found in the Bristol Study of Language at Home and at School (Wells, 1986). On the other hand, as we also found in the same study, it is singularly lacking in schools. Not only do children almost cease to ask real questions at school, but teachers rarely ask them to express and explain their beliefs and opinions – at least with respect to the official curriculum. What makes this contrast so striking is that many of those who teach all day from the recitation script are themselves parents who dialogue with their children at home.

Is the almost complete absence of dialogue in the classroom inevitable, then -- as many teachers seem to assume? Or is it possible to create conditions that make its emergence more likely to occur? These were the questions that the Developing Inquiring Communities in Education Project (DICEP) attempted to answer through collaborative action research.

**Adopting an Inquiry Orientation to Curriculum and its Impact on Classroom Discourse.**

As the title of the project suggests, the focus was not directly on dialogue, *per se*. In planning the project, we followed Vygotsky in treating discourse as a means to the achievement of the goals of other activities rather than as an activity in its own right. On this basis, we decided that little success would be achieved by encouraging teachers to engage in dialogue for its own sake, since, to be effective, the genre of discourse selected on any occasion must be appropriate for the purpose of the curricular activity it is designed to achieve. Instead, therefore, our question was: In the service of what sort of approach to the curriculum would dialogue most naturally arise? Or, putting it rather differently, under what conditions would students’ perspectives be considered relevant and important to take into account?

In choosing to focus on inquiry, we took our lead from Dewey (1938), who argued that education should be based on inquiry into issues of social as well as personal significance. This had proved to be effective in classrooms we had previously observed, in which an increased level of student engagement occurred when they had some choice concerning which aspect of the class’s curricular topic they would investigate and how they would conduct their inquiries (Wells & Chang-Wells, 1992). Accordingly, in setting up the project we invited teachers who were interested in adopting an inquiry orientation to curriculum and in collaboratively
documenting and investigating their attempts to create communities of inquiry in their classrooms. Most of the teachers who joined the project had already taken courses at the university, in which they had gained some familiarity with sociocultural theory; they had also had some experience of carrying out research in their own classrooms.

The project started in 1991 with a focus on science, since science lends itself very readily to an inquiry orientation. But very soon the teachers found that inquiry was spilling over into other areas of the curriculum. So, when we applied for a further grant in 1994, we broadened the scope of our inquiry to include all aspects of classroom life. In fact, one of the teachers who joined the project at that stage chose to establish the practice of holding regular class meetings and then investigated how the experience of considering alternative points of view on social issues affected her students’ ability to engage in productive discussion about the stories she was reading to them.

Each member of the group chose their own way of approaching our central question and collected data relevant to their individual inquiry. However, it was agreed that, when videorecorded observations were made of the curricular units on which they focused their inquiries, these recordings would be included in the project database. Extracts from these recordings that involved whole class or small group interaction were then transcribed and copies of the transcripts were handed back to the teachers for them to use in pursuing their inquiries.

As stated earlier, our major focus was on how the participating teachers would attempt to create communities of inquiry in their classrooms and how engagement in inquiry would affect students’ learning. For six years (1992-1998) we met regularly once a month and occasionally for a full day. At the majority of these meetings one member updated the group on the progress of her or his inquiry and the remaining members offered comments and suggestions. As the project progressed, more and more of these individual investigations were presented at teacher conferences and several were written up and published in a variety of educational journals and books (e.g. Wells (ed.) 2001). However, while almost all of their presentations drew on transcribed excerpts from the observations, the focus was rarely on language per se; rather the discourse data were used to illustrate ways in which students were becoming more engaged in learning and more adept at carrying out group inquiries in the process.
Quantitative Analysis of Discourse

In the final year of the project, the university members of the group began to carry out linguistic analyses of the corpus of transcripts that had been prepared, using a coding scheme based on the same theory of linguistic interaction as used in the Bristol Study, but substantially revised to place more emphasis on the sequential organization of the discourse and of the functions that teachers’ and students’ utterances performed in the co-construction of meaning. In particular, we enlarged the definition of the third move in triadic dialogue to take account of the various different ways in which a teacher might follow up on a student’s answer to a teacher’s initiating question (Wells, 1993).

The Coding Scheme

Space does not allow a detailed presentation of the coding scheme here, but figure 1 gives a summary overview of the hierarchy of levels at which coding was carried out, together with the major categories at each level.5 (A summary of the coding scheme is included as Appendix 1.)

Figure 1. Overview of Coding Scheme

<table>
<thead>
<tr>
<th>Level of Analysis</th>
<th>Categories Coded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Episode</td>
<td>Activity, Task Orientation, Participant Structure.</td>
</tr>
<tr>
<td></td>
<td>Episode Developement, Cohesive Links, Level of Cognitive Demand</td>
</tr>
<tr>
<td>Sequence 1 …….. Sequence n</td>
<td>Exchange Type, Initiator,</td>
</tr>
<tr>
<td>(Preparatory) Nuclear (Dependent) (Embedded)</td>
<td>Prospectiveness, Function, Evaluation, Length.</td>
</tr>
<tr>
<td>Initiation Response (Follow-Up)</td>
<td></td>
</tr>
</tbody>
</table>
As can be seen from figure 1, the most inclusive unit was an episode of discourse, which was defined as a stretch of talk in which the topic and the participant structure continued essentially unchanged. Important descriptive categories at this level were the curricular activity involved, the participant structure and the role that the discourse played in relation to the curricular unit in question. At the next two levels, those of sequence and its constituent exchanges, we coded, first, who initiated the sequence, and the function of the discourse move they made in that role. For this purpose, we distinguished whether a teacher initiation was a question or an informing move and, if the former, whether it asked for information supposed to be known or posed a problem and invited suggestions, conjectures or explanations for open-ended discussion. Second, we focused on the occurrence of teacher follow-up moves and the functions that they performed. We also coded the length and complexity of student moves.

The first analysis to be carried out focused on episodes of teacher-whole class interaction (43 in total), comparing the ways in which the style of discourse varied according to the curricular topic (science v. arts) and according to the role of the discourse in relation to the curricular activity in progress (management of activities v. exploration of ideas). In a nutshell, what we found was that the interaction became more dialogic when the class was engaged in the latter (e.g. planning, interpreting or reviewing student inquiries). By contrast, episodes of teacher-led instruction, classroom management, and checking on what had been learned, tended to be characterized by shorter sequences of talk on a particular issue and a higher proportion of evaluative responses to student contributions. In general, however, there was little systematic difference between science and arts topics (Nassaji and Wells, 2000).

Shortly after the paper just referred to was accepted, we read the report by Nystrand et al. (2002), in which they described the coding scheme that they had used in a large-scale study of classroom interaction in English and social studies in secondary schools across a number of states (Nystrand and Gamoran, 1991). We were particularly interested in two categories that they considered to be implicated in the occurrence of what they called "dialogic spells", that is to say, moments when the interaction shifted from implementation of a "recitation script" to what Tharp & Gallimore (1988) called an "instructional conversation". The two categories were Level of Cognitive Demand and Level of Evaluation, each of which they coded as “high” or “low”. What distinguished high from low evaluation was the occurrence of teacher “uptake” of the student’s response in the former, either through its incorporation in the teacher’s follow-
up comment or through a request for the student to give further elaboration or explanation. We were also interested in their construct of "true" discussion, which they defined operationally as "the free exchange of information among at least three students and the teacher that lasted at least a half minute during a classroom instructional episode. [It] tends to be marked by the absence of questions, either by the teacher or student, except for purposes of clarification." However, we modified this definition slightly to read "the free exchange of information among at least three participants, with or without the inclusion of the teacher."

As a result, we decided to extend the coding scheme to include these categories in order to enable us to carry out a more detailed investigation of the relationship between the type of move that initiated a sequence of interaction and the way in which the teacher followed up on student contributions. At the same time, we divided the coded observations into two sets: those that were made early in each teacher’s participation in the project and those that were made later. The purpose of this analysis was to find out whether a commitment to adopting an inquiry orientation to the curriculum would lead to a change in discourse style over time, with a greater proportion of sequences involving dialogic interaction as the teachers became more adept at engaging students in inquiry.

**The Sample**

Over the seven-year duration of the project, twelve teachers were involved in the DICEP group but, unfortunately, they did not all participate for an equal length of time; in fact, their involvement varied in duration from one year to eight years. Of these twelve, only nine teachers contributed episodes of teacher-whole class interaction to the database. Three of these (GD, JB and NS) withdrew at the end of the first year and, since the episodes they contributed were not widely separated in time, these episodes were all classified as ‘early’. By contrast, three of the teachers who were involved for four or more years (WG, HK and KM) did not contribute any episodes of whole-class interaction to the database until near the end of their participation; this was mainly because their early inquiries focused on small group work. Those episodes that they did contribute were treated as ‘late’. There were thus only three teachers (AJ, VM and DZ) whose recorded episodes of whole-class interaction could be divided between ‘early’ and ‘late’; however, between them, they accounted for 20 of the episodes in the database (47%) (see table 1).
Table 1. Distribution of Episodes by Teacher

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Number of Episodes</th>
<th>Early</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>GD</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>JB</td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>NS</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>WG</td>
<td>0</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>HK</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>KM</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>AJ</td>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>VM</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>DZ</td>
<td>6</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td>24</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

When considering the far from optimal nature of this database of whole-class interaction, it has to be remembered that the project was not originally designed with the current investigation in mind, as the teachers voluntarily joined the project with the principal aim of collaboratively investigating whether and how it was possible to approach learning and teaching through an inquiry orientation to curriculum. Clearly, however, the teachers’ unequal participation imposed serious constraints on the statistical analyses that could be performed on the data and limited the conclusions that can be drawn from the quantitative results.

Analytic Procedure

The procedure followed was first to carry out the additional coding required. This was done by the authors with the assistance of a graduate student, using a custom made program in FileMaker Pro 4. In the small number of cases where there was disagreement, the senior author made the final decision in order to ensure consistency of coding. The next step was to compute proportional frequencies of alternative sub-categories within each major category for each episode. For example, for the category ‘Sequence Initiation’, the proportional frequencies of the three subcategories ‘Teacher Initiating Question’, ‘Teacher Initiating Inform’, and
‘Student Initiation’ were computed; similarly, where the sequence was initiated by a teacher question, the proportional frequencies of the two sub-categories ‘Known Information Question’ and ‘Negotiatory Question’ were computed. Then, with the proportional scores for each category in each episode grouped according to whether the episode was ‘early’ or ‘late, the significance of the observed differences between the two groups’ scores was computed using the Wilcoxon-Mann-Whitney U test.

Results of Quantitative Analysis
The comparison between “early” and “late” observations focused on three groups of categories: the first concerned sequence initiation, the second, teacher follow-up, and the third included measures of the length and complexity of student contributions, the mean length of sequences of interaction, and the frequency of sequences meeting the criteria for “true discussion. The results are displayed in tables 2a and 2b and in figure 2.

Table 2a. Distribution of Episodes and Sequences (All Teachers Combined)

|                      | Early | Late | P <
|----------------------|-------|------|-----
| Episodes             | 24    | 19   |     
| Sequences            | 494   | 612  |     
| Mean Sequence Length | 1.53  | 1.61 | n.s.
| Mean Response Length | 1.76  | 2.33 | .05

Table 2b. Characteristics of Sequences (All Teachers Combined)

|                                                        | Early # (%) | Late # (%) | P < 
|--------------------------------------------------------|-------------|------------|-----
| Teacher Initiating Questions (TIQs)                    | 348 (70.5)  | 328 (53.6) | .05 
| Student Initiations                                   | 63 (12.7)   | 225 (36.7) | .01 
| TIQs: Negotiatory                                     | 150 (43.2)  | 198 (60.3) | n.s.
| TIQs with High Cognitive Demand (HCD)                  | 182 (57.3)  | 196 (59.9) | n.s.
| TIQs followed by High Evaluation (HE)                  | 109 (31.4)  | 147 (44.7) | .05 
| TIQs with HCD and HE                                   | 89 (25.6)   | 80 (24.3)  | n.s.
| HE realized by Follow-up Question                      | 16 (14.9)   | 44 (30.1)  | .001
| TIQs with HCD followed by Null Evaluation              | 8 (4.5)     | 37 (18.7)  | .01 
| ‘True Discussion’                                      | 6 (1.3)     | 34 (5.6)   | .05

16
In interpreting these results, it is important to understand that the variables within each of the first two groups are not independent. Starting with initiation, it can be seen that the proportion of sequences that was initiated by a teacher question decreased significantly from an average of about 70% in the early observations to an average of approximately 50% in the later (p < .05). There were two reasons for this decrease. First, there was an increase in the proportion of teacher sequence-initiating moves that gave information rather than demanding it. But much more important was the considerable increase in the proportion of sequences that
were initiated by students (instead of by the teacher) (p < .01). At the same time, there was a substantial increase in the proportion of all teacher initiating questions that asked for information that was open to negotiation. In fact, it was such questions that most often led to students initiating subsequent sequences.

Turning to the second group of comparisons, those concerning teacher moves providing follow-up to student contributions, there were three significant changes. First a greater proportion of all teacher follow-ups showed uptake of the student contribution (High Evaluation, p < .05) and, of these, a greater proportion took the form of a request for further explanation, exemplification or justification (p < .001). A further interesting finding was that, in the case of teacher questions that posed a high cognitive demand, there was a significant increase in the proportion of student responses that did not receive any evaluation (p < .01). On inspection, this was seen to occur most frequently when, instead of providing follow-up, the teacher invited some other student who was bidding to respond, which frequently led to the invited student initiating a new sequence.

The final set of comparisons is also interesting but, in two cases somewhat puzzling. The increase in student mean response length (MRL) was not at all unexpected in the light of the preceding results: When students had the opportunity to initiate, they tended to speak at much greater length and with greater linguistic complexity (p < .05). On the other hand, the almost complete lack of difference in the average length of sequences (MSL), that is to say, the number of exchanges required to complete the sequence, was initially rather surprising. Certainly, in the later episodes there were many instances of much longer sequences in which the topic was developed over many exchanges. On the other hand, when the teacher provided no follow-up and another student took the floor, the first sequence frequently consisted simply of the nuclear exchange and the next student’s contribution constituted a new sequence in its own right. Taken together, these two significant changes in the patterns of interaction in the later episodes seem to have cancelled each other out, as it were, giving rise to an overall average sequence length that was not significantly different from the average length of the earlier episodes.

However, it is the last comparison that is the most puzzling. The finding that there was a significant increase in the proportion of sequences including “true discussion” (as defined by Nystrand et al., 2002) in the later episodes (p < .05) was not at all unexpected. What was
unexpected, however, given the other significant differences found, was the overall very low average frequency of such sequences. We were therefore interested to discover what other features were associated with such discussion sequences. To ascertain the strength of the relationship among the selected variables, a correlation matrix was constructed (see table 1).

### Table 1. Correlation Matrix: Indices of Teacher-Whole Class Interaction

<table>
<thead>
<tr>
<th></th>
<th>%TIQ</th>
<th>%S Init</th>
<th>%NQ</th>
<th>%HEval</th>
<th>%DepFup</th>
<th>%NE</th>
<th>MSL</th>
<th>MRL</th>
<th>%DiscSeq</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%S Init</td>
<td>-0.892***</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%HEval</td>
<td>-0.112</td>
<td>0.097</td>
<td>0.393**</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>%DepFup</td>
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<td>0.050</td>
<td>0.259</td>
<td>0.828***</td>
<td>-</td>
<td></td>
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<td>%NE</td>
<td>-0.223</td>
<td>0.263*</td>
<td>0.357*</td>
<td>0.005</td>
<td>0.063</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSL</td>
<td>0.113</td>
<td>-0.101</td>
<td>0.150</td>
<td>0.527***</td>
<td>0.616***</td>
<td>-0.123</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MRL</td>
<td>-0.660***</td>
<td>0.810***</td>
<td>0.244</td>
<td>0.093</td>
<td>0.077</td>
<td>0.310*</td>
<td>0.071</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>%DiscSeq</td>
<td>0.437**</td>
<td>0.543***</td>
<td>0.260*</td>
<td>-0.022</td>
<td>0.049</td>
<td>0.575***</td>
<td>-0.14</td>
<td>0.554***</td>
<td>-</td>
</tr>
</tbody>
</table>

For Key, see Figure 2  
* p < .05,  ** p < .01,  *** p < .001

As this table shows, the occurrence of a sequence involving discussion was highly likely to be found in an episode in which a higher than average proportion of sequences was initiated by students (r = .543, p < .001), where teacher initiating questions tended to involve information for negotiation rather than for known information (r = .260, p < .05), and where a greater proportion of student responses to questions involving a high level of cognitive demand received a ‘null’ evaluation (r = .575, p < .001). However, this still did not explain the overall low frequency of “true discussion.” From our observations, we had expected to find a much higher proportion of such sequences, as our impression was that the later episodes were considerably more dialogic than the earlier ones. This led us to reexamine the data in order to find out what had created the impression of increased dialogicality and also to question
whether the definition proposed by Nystrand and colleagues was really appropriate as a way of identifying occurrences of dialogic, as opposed to monologic, interaction.

However, before turning to a qualitative analysis of the data, it is worth asking how far the overall trends illustrated in figure 2 were matched by changes in individual teachers’ styles of interaction over their participation in the project. As will be recalled, only four teachers supplied data that allowed a comparison to be made between early and late episodes. In two of the four cases, these were recorded in different curricular areas; furthermore, the total number of episodes contributed by each teacher varied between four and twelve. It was therefore not adopted, as in figure 2, was to compare mean values for the selected variables for early episodes and late episodes for each teacher. These are displayed in figure 3.

**Figure 3. Individual Teachers’ Change Over Time**

![Graph showing individual teachers' change over time.](image-url)
What these individual charts reveal is to a considerable degree in accord with the overall trends shown in figure 2. Three of the four teachers showed a decrease in the frequency with which they initiated sequences with a question, with VM starting lower than the other three and maintaining approximately the same frequency. As would be expected, all teachers showed a concomitant tendency to allow more student initiation, this trend being strongest in the cases of AJ and DZ. Thus, in this connection, it is not surprising that in all these teachers’ classes, there was a trend for “later” students to make longer and more complex contributions.

On the other hand, there was much greater variability among the teachers with respect to the frequencies with which they asked initiating questions for negotiation; AJ and DZ tended to ask more such questions in later episodes, while VM showed no change and JB showed a clear decrease. A similar variability can be seen in their use of the follow-up move. VM and AJ increased the frequency with which they gave high evaluation and also the frequency with which this took the form of a follow-up question; JB, on the other hand, showed a decrease over time on both these measures.

Most interesting among the four teachers is DZ. As can be seen, there was a very substantial change in the distribution of sequence initiation over time, with students initiating the same high proportion of sequences in later episodes as the teacher did in the early ones. While remarkable in its own right, this change in sequence initiation also goes a long way toward permitting an interpretation of the changes in the use of the follow–up move. Since the
teacher made so few sequence initiations with a question in the later episodes, there were proportionally far fewer occasions on which a follow-up move could be expected. However, on those occasions that did occur, it can be seen that this teacher increased the proportion of follow-up questions and much more frequently gave no follow-up at all.

**Qualitative Analysis**

While useful in giving a synoptic view of the relative distribution of different kinds of moves, quantitative results of the kind just presented can tell us little about the way in which particular episodes developed and nothing about the larger pedagogical context in which they occurred. As such, they can throw little light on the ways in which the teachers modified their style of interaction over time, both as a result of their increasing skill in encouraging inquiry and in relation to their pedagogical intentions on particular occasions. To reach a better understanding of these matters, it is necessary to examine particular episodes in a qualitative manner or, as the French would say, to engage in an “explication de texte.”

In the space of an article such as this, it is not possible to approach all the episodes in this way nor even to do justice to but a few. In this section, therefore, we shall briefly present extracts from five episodes in an attempt to give a flavor of the range of settings and discursive contexts in which we considered dialogue to be taking place. Then, on the basis of these examples, we shall return to a consideration of the conditions that make dialogue more likely to occur.

**Extract 1. Planning to Study Weather (DZ, Grade 4)**

As Matusov (1996) points out, it is not necessary for participants to agree substantively for them to achieve intersubjectivity about at least some fundamental aspects of the topic under discussion, such as what is being referred to. In fact, as he argues, there is little to talk about if there is already agreement about all aspects of the topic. It is not surprising, therefore, that dialogue most frequently arises out of a difference of opinion or of intention. This was certainly the case in the extract that follows.

This extract comes from one of the earliest episodes in the database, in which the teacher and students were planning how to organize the unit on which they were embarking.
Drawing on the students' written questions, the teacher invited suggestions for aspects of "weather" they might investigate. She then asked for suggestions as to how they might organize their work together. It was in this context that the following sequence occurred, as students took up positions on whether working with a friend would be a good idea or not.

T: Any other ideas?

[Several students raise their hands]

T: Colin?

Co: You could pick one person who could pick- like we skip people and you pick one person and they get their own group

T: So I would pick somebody and then they would pick who they wanted to work with?

Co: And then- yeah- see how much group xx xx with another person

Pa: I don't think that's the best because some people might- if they pick all their friends they- they might get um- .. they might get too crazy and then they won't get any work done

To: Yeah, but with people that you don't like or anything then you don't x x or- then you won't get any work done either

Ma: But see there's a limit! . and then um you got all your friends you want and then you've got one friend and you ask them-

T: OK . that can be a problem

Pa: But like sometimes if they're really comfortable <then> they get a lot done

T: Yes . and I know that when I take courses at night and I get to work with people- I like to work with my friends in the course . I wouldn't like it if the professor told me I had to work with someone that I didn't get along with- I prefer to work with my friends .

But I agree completely with you Tom . and that is that sometimes when

---

1 In this and all subsequent example, CAPS are used to indicate emphasis; underlining to indicate overlapping speech; <> to indicate uncertainty about transcription; * to indicate an unintelligible word-like segment; - to indicate an interruption; and . to indicate a noticeable pause, with the number of periods corresponding to the duration of the pause in seconds.
you're working with friends it's harder to focus and concentrate so- there are two sides to that

Ka: But then you usually get along with people in the class. OK like you're solving the problems- you're only working with them you're not discussing your personal life

T: That's right. and you do have a focus that's the work. so it shouldn't be a big problem to work with other people. you're right

Here, the spur to discussion was the very important issue of which other students they would get to work with in carrying out their inquiries. At issue were two criteria: interpersonal relations and academic productivity. The students were clearly aware of their frequent incompatibility, but also wise enough to know that there is not a single best solution. As the teacher makes clear, she also recognized this to be an important issue and in her contributions she showed strong uptake and supported their alternative points of view by describing her own contemporaneous experience as a student.

When this class was later engaged in making and interpreting observations, however, there were few such spontaneous expressions of conflicting points of view. In fact, in our recordings from this unit, there was only one sequence, in which a student was justifying his claim that volcanoes “count as” weather:

Sa: ‘cause it [the volcano] affects the weather- the sun.
Sb: What?
Sa: Remember- I think it was in the Phillipines- um the volcano erupted-
Sb: Yeah
Sa: - and the cloud ****

[Several other students speak at once, drowning Sa]

T: They say that volcanoes affect the weather

For the majority of the time, when talking about the substantive content of the unit, sequences were in strict IRF format, though often including one or more dependent exchanges; they also typically involved a single student in the interchange. Possible reasons for this will be considered below.
Extract 2. The Ethics of Scientific Investigations (AJ, Grade 6)

The following extract occurred at the end of the school year during a biology unit in a grade six class, in which the students had been observing the development of painted lady caterpillars. Most of the caterpillars had reached the stage at which they had attached themselves to the gauze covering of the plastic cups in which they were kept and had spun the cocoons within which they would metamorphose into butterflies. Earlier in the lesson the teacher had asked students to propose investigatory questions for this phase in the cycle and Nir, a second language speaker of English who had joined the class while his parents were visiting from Israel for one year, had proposed to carry out a series of dissections to establish the nature of the changes taking place inside the cocoon. As Nir’s plan would involve several students donating their chrysalises to the experiment, the teacher called a class meeting to discuss his proposal. At the point at which this extract begins, Nir is trying to persuade the teacher and his classmates that his plan is truly scientific.

T: Any other ideas? [if] you have a feeling either for or against this.

Nir (calling on him to speak)

Ni: I don't agree with Jennifer because what I said at the beginning is that we want to go like from the beginning and to see how they change. .. like let's wait (= if we wait) until the end and then we'll not know in which part of their life they- they died. like 'cause if they died from the beginning. so we'll- we wouldn't know. like we wouldn't know when they died if we will do it in the end.

T: OK, so you want to see day one what they were at. then day four what stage it was at inside. then what's developed- if it developed ears or legs on day eight_ and so on?

Ni: Yeah. that's- and I don't think that people. even if it will be a majority. like that the class will want to open them. and so I think that just the people who would like to give theirs to science will like give theirs.

T: I'm not going to stop you from doing this if you want to do that.
Up to this point, although sequences had been quite extended, in most of them the teacher had interacted with individual students, one at a time. However, not all the students were as apparently open-minded as the teacher about the acceptability of Nir’s proposed investigation. A little later the strength of the disagreement became clear when Eve was called on to give her opinion. For her, there were important ethical grounds for rejecting his proposal and she addressed him directly.

T: Eve, do you have any ideas?

Ev: Yeah, OK, Nir, how would you feel if you were a newborn baby, another baby, and someone wanted to cut you up and see what's happened with you, how would you feel?

Ni: OK, like- (temporarily nonplussed)

Ev: That's how the caterpillar feels.

Ni: - if you'll suffer for one minute, it's no big deal, like we can open them and- what I think is that the- the-, I think that they live just inside the chrysalis and the chrysalis isn't part of their body, it's just a part that protects them, I think that they will still die if we open it but they will not like suffer, in the end like we can kill them, we can like smash them.

SS: Ohh! [many students express horror]

Ni: Yeah but why should we leave them to be like cold, we have to finish with them fast, without hurting them, like the guillotine, it sounds ugly but it's killing it fast.

Es: I'm not against him or anything, I would give mine up.

T: So it's just regarding the feelings of the caterpillar that you think it might have <greater>, the value to science would be greater?

Es: No (apparently agreeing), I'm not giving it to him though.

T: But you would?

Es: Yeah.
The to and fro of opposing points of view continued for several more minutes with the teacher making few substantive contributions. Finally, it became clear that the majority was opposed to the proposed dissections, mainly on ethical grounds, and Nir gracefully accepted the majority opinion – at least for the moment.\textsuperscript{9}

Clearly, as with the first, this discussion was not pre-planned, since it was provoked by Nir’s unexpected, controversial proposal. However, in allowing the students to discuss its merits and demerits without imposing her own point of view, the teacher allowed dialogue to emerge and gave all students who wished an opportunity to state their positions and to argue for or against those of others.

**Extending the Contexts and Forms of Discussion**

The two preceding extracts came from early in the project, and showed the two teachers concerned beginning to allow discussion to continue when it emerged spontaneously. At this stage in the project, however, as these extracts illustrate, when stretches of dialogic interaction occurred, they tended to arise almost by chance, because the students felt strongly about the immediate issue under consideration, rather than because the topic itself was approached dialogically. As we reflected on this and similar episodes, the challenge became one of finding ways of organizing activities so that they would be likely to generate more occasions of this kind and in a wider range of curricular areas.

The following three extracts illustrate some of the ways in which the discourse did change as the teachers and students became more involved in inquiry. In particular, they show how the teachers became more adept at deliberately creating activities that invited the students to engage in dialogue. The first occurs in the context of responding to a literary text.

**Extract 3. Making Sense of a Complex Narrative (DZ, Grade 4)**

The teacher in this extract (the same teacher as in extract 1, but three years later) made a practice of reading aloud every day to her grade four class and of encouraging the students to discuss the story after each daily read-aloud. In the December of the fourth year of her participation in the project, she decided to read *Mrs Frisby and the Rats of Nimh*. She also decided to videotape the follow-up discussions. Following the first two recordings, she spent some time viewing the videotapes and was dismayed at what she discovered. Far from having
encouraged free-flowing discussion, as she had hoped, the videorecordings showed that a version of the IRF structure still dominated the interaction. As teacher, she called sequentially on children who had their hands up, they expressed their thoughts about the story, and she provided some form of positive follow-up. She then moved on to the next volunteer. Given this discourse structure, children’s remarks were always addressed to her and so, not surprisingly, there was little or no interchange among the students themselves.

The next day, the teacher talked to the children about what she had seen and proposed a new discourse format. As manager of the discussion, on completion of her reading, she would nominate a child from among those who wanted to speak and, following his or her turn, any other child who wished to speak to the same topic could do so without waiting to be nominated. She also emphasized that, in a good discussion, people link what they say to previous contributions and make clear how their own contribution relates to what went before. Although unfamiliar as a way of conversing in the formal context of “a lesson”, the children had little difficulty in adjusting to the new format and in the discussions that followed the read-alouds of the remaining chapters, the frequency of “true discussion” (Nystrand et al., 2002) among students increased dramatically, averaging almost 30% of all sequences as opposed to less than 2% on the first two occasions.

In the following extract, however, unlike the discussions that had followed the previous days’ read-alouds, when the children had largely been making and debating predictions about how the story would continue, this final discussion was intended to engage the class in reflecting together on the story as a whole. This they did initially by saying what they liked about it, mentioning particular events that intrigued them, and also by suggesting alternative ways in which a sequel might continue the saga of the rats’ attempts to foil the humans’ efforts to recapture them in order to continue their experiment or, failing that, to exterminate them altogether.

It was in this context that another teacher who was visiting the class posed a question, as prearranged with the class teacher, asking the children which of the two leader rats, Justin or Jenner, they would choose to follow if they were given the choice. Like them, the visitor knew that, at the conclusion of the novel, those rats that survived the gassing of the comfortable home they had constructed under a rosebush close to a farm had to choose between two alternatives. Justin considered they would be better off if they started a new settlement further
away from humans; Jenner, on the other hand, was keen to continue the technically advanced way of life that was made possible by tapping into the water and electricity services to be found near human habitations. By asking them to explain which leader they would follow, the question invited them to explore one of the main themes of the story by relating it to their own experiences and values.

The extract starts after one or two children have offered their points of view.

Ka: I'd go with Justin. uhm. 'cos .. uhm. like human beings- we don't like it when <people do things to> us and so . I think they have a right to . uh- do what they wanna do . . . <just like> other people . like humans-

S?: Not ALL HUMANS

Ka: ***and I think *** I think that they're doing the right thing by not dealing with it (inaudible)

Fr: But how would******

Ss: No . no-o-o

Je: <They> could be either ** living here . and when they got there they could just **-

Me: <live on> the fruits that they had

T: Uh-huh

Me: They already had a fruit supply there

T: Yes they had a fruit supply there

An: Well if I could split myself in half and stay alive I would go both ways because . if I went to Jenner's side it would be easier and you'd have electricity and stuff . and if I went to Justin's side . uhm- it'd sort of be safer because you're with a whole bunch of other rats

T: (nominates David)

Da: I would go with Justin because . I know that my life is boring because I have running water and electricity that I can use whenever I want . so I want- I'd like uh- life to be a bit more of a challenge

T: That reminds me of one of the reasons why my family-. why we enjoy
going up to our cottage- because we don't have any luxury at the cottage. 
we only have running COLD water- . so to do dishes you have to heat the 
water up-

S?: ** (interruption)

T: - and we don't have any <toilet> we just have an outhouse . and . we-
we're on top of a big hill . so you have to haul everything up and down the 
hill and you have to take a * . so we do that . and we LOVE it and then we 
get back to the city and we really appreciate . being able to turn on the hot 
water and walk to our house from our car in two seconds- you know . so . 
it's kind of- I know what you're saying- it's nice . and I feel lucky to have that 
chance to live out a harder life sometimes . that makes me appreciate my easy 
life that I have every day . <what you said> that really reminds me of my 
cottage ..

T: (nominating) Frank and Adam and then we'll stop

Fr: If I were Jenner . I would've waited a bit and like . and maybe a while before . 
that . uh. a week . or so before . uhm . a week after . what's his name? gave 
me that * I would have waited . and then I'd have got . Jenner- or I decided 
like- I didn't wanna stay *** like . I think Jenner should've stayed a bit longer . 
to find out all- uh more in more detail

Ad: Uhm- I think a better idea- I'd go with Justin- 'cos uhm- if you go with Jenner . 
you rea- you could easily get caught because they like- realize that you're 
trying to steal stuff . and uhm . and <then also> maybe doctor Schulz would 
come after you and finally catch you so it would be- a smarter idea to go 
with Justin ..

T: Everybody, that was again a great discussion . for over fifty- not fifteen but 
fifty- five- oh- minutes- listening to me read for about half an hour and then 
talking for about twenty five minutes or so- that's amazing! I don't think you 
could have done that in September

Although those unfamiliar with the story may have some difficulty in following the 
finer points of this animated discussion, it is clear that the arguments that the children put
forward for their choices were intelligible to the other members of the class, since the latter extended them or offered alternative points of view. It is also clear that they understood the implications of the two alternatives. Particularly interesting in this respect are Andrew’s explanation of the quandary that he finds himself in and David’s willingness to take on the challenge that Justin’s alternative presents.

The teacher’s reply to David and Andrew, which is more a conversational response than a follow-up move, both takes up their contributions and relates the alternatives they have presented to her own family’s arrangements, which enable them to have the advantages of both worlds. Then, in the second part of her contribution, she restates the contrasting values to which the two rat leaders are committed. Finally, Adam, the last student to have a chance to speak, takes a more pragmatic position in choosing the greater security that Justin’s plan offers.

This extract shows how far this class has come since the teacher adopted a more dialogic format for their discussions. Not only are they listening to, and responding to, each other, but they are also, together, deepening their understanding of the conflicting values that the novel embodies.

In this sort of discussion, which is entirely appropriate as a response to a work of literature (Donoahue, 1998), there is no expectation that the class will reach a consensual conclusion. However there are many other curricular contexts in which the absence of progress toward an agreed conclusion – or at least toward a set of acceptable alternative conclusions – would be seen by most educators as a serious limitation to dialogue. Thus, in the following extracts, selected from other curricular areas, we see teachers using alternative strategies to help the students move toward an agreed-upon conclusion.

**Extract 4. Estimating, Predicting and Guessing (WG, Grades 3 and 4)**

This extract comes from a lesson in a unit on mass in a split grades three/four class in a multi-ethnic, inner-city neighborhood. In the previous lesson, a number of groups had forgotten or failed to predict the outcome of their experiment, prior to manipulating various provided materials to find out whether mass changes when matter changes state. Apparently, in some cases, they had not been clear about the difference between estimating and predicting. In responding to their admissions, the teacher had, once again, emphasized the importance of making a prediction, as she believed it to be critical for the scientific nature of the activity. In
order to predict the outcome, she explained (Wells, 1999), one needs to consider what one already knows about the situation and how the experimental intervention is likely to change it. Predicting thus calls for a theoretical stance to the actions to be performed, which is crucial for a ‘scientific’ as opposed to a purely ‘hands-on’ approach to practical work in the classroom (Driver, 1983). At one point in the same lesson, the teacher had also drawn attention to the need for the current speaker to take account of the contributions of previous speakers in framing his or her own contribution.

In the following extract, which occurred at the end of the unit, the teacher revisited the issue of predicting by asking the class to consider the relationship between predicting, estimating and guessing: “Are they essentially the same activity or are there important differences between them?” This question may appear to be somewhat tangential to the curricular unit on mass in which it occurred. However, the teacher was quite clear that the distinction she was asking the students to consider was central to the practice of doing science in general.

The extract starts a few turns into the discussion, which continued for some thirty minutes, as different students considered various scenarios in their attempt to clarify the differences and similarities between the three “mental activities”. By the end, as the teacher commented later, there was really nothing further for her to add; between them, the students had made all the distinctions that were found when they subsequently consulted the Concise Oxford Dictionary.

1 T: You heard somebody who says they're not the same. now there's a whole bunch of <you> who say they're [predicting and estimating] two different mental activities. What do YOU think, Emma?

2 Em: I think that- well I don't agree with Peter because I think that they are two different things .. ‘predict’ is sort of like guess what will happen . and then ‘estimate’ is like you estimate the mass using a form of weight, centimeters. and it's not just with mass, you estimate other things .

3 T: OK (nominating Arthur)

4 Ar: I don't agree with Peter either because `predict' sort of means like what WILL happen and `estimate' is the er- do it- estimating something
that's already there, but taking it further

5 T: Now, listen to both answers. None of the answers are right or wrong. Will someone make a distinction? Arthur has made a little- even a more- greater distinction. OK?

6 Je: I don't agree with Peter (laughs) because he said that 'estimate' is guessing. And 'predicting' is ALSO guessing but. Um- actually guessing is also different from those two because when you guess you don't have very much information about the object or the thing

7 T: Uh-huh

8 Je: - and so you're just making a- like a wild guess. But when you predict you're- you're actually you're maybe doing an experiment. And you are trying- using the information, you are trying to find out what would happen-

9 T: Mm

10 Je: - and estimating is um different from guess because. You have um certain information, for instance if you estimate the mass, you get the object in your hand and you. You have the weights in the other hand and you can sort of. Like estimate the. Mass, so it's not guessing

11 T: OK. Brian?

12 Br: Um- I-I don't agree with Peter. Um as well and I think that 'predicting'. Is. If you predict then you're saying that. Um. I'm predicting what's going to happen to me tomorrow - what I'm going to do tomorrow and with 'estimating' you would- it would just be something like um. If . Um . you would- you would est- you would estimate um. Um . estimate how heavy or something is

13 T: OK, that's a good attempt again

Emma?

14 Em: I'd really like to revise it a little. But I started by <changing a little> and so we get a little information and then you go further, see what will happen next. I think it's true and. For estimating we also. Like-. <For anything> you look at the object. And then you guess- Well you DON'T guess but then you try to like you have a- some weights and then you. Like try to feel the um-
see what it weighs or that's how I think it is (trailing off)

15 T:    OK. William?

16 Wi:    I don't agree with um. Peter because. um in our math book it says estimate
to the nearest tenth but it didn't- it doesn't say PREDICT to the nearest tenth

17 T:    That's right. so what's the distinction?
Good, you're using your experience in math. to help you make a distinction

[Several more sequences of the same kind follow, in the last of which
Brian makes a lengthy contribution in which he uses a tennis ball as example.
In what follows, others work with his example]

25 T:    Yes. so what happens is- Brian was saying if I say 'estimate'. 'estimate
The mass of a tennis ball' . you're talking about a feature of the object . but if
I say 'predict what will happen to the tennis ball if I threw it at a speed of ten
kilometers' I’m asking you to tell about what HAPPENS. to the tennis ball. not something ABOUT the tennis ball . and that ties back to right at the
beginning Arthur says. 'predict' is what WILL happen.

26 Em:    I think Brian was right and so in a sort of way his answer was right .
but then. like I'm going to say. like I'm going to estimate it and predict. well
‘estimate’ is usually asking. something where you like already learned or have
some information about the- like, say we use the tennis ball again, but then
‘predict’ is. what will happen AFTER you do something to a tennis ball or like
maybe you might. bounce it and say how-. what will happen

27 T:    OK. (points to Brian)

28 Br:    Um. if-. ‘estimated’ would be . that um- if- if you estimate the ball-. the ball's.
um. mass . and then you would predict whether it would be the same weight.
after you- (trails away)

29 T:    OK, you can say-. OK . he- er Brian is trying to bring in a closer distinction ..
he was saying estimating the mass of a tennis ball. now predict what would
the mass of the tennis ball be if I put- if I attach, say, .. two feathers to the
tennis ball-
30 Br: uh-huh
31 T: -would you say ‘predict’ or ‘estimate’?
32 Ca: And also I agree with Brian because um ‘predict’ can be used like in two ways, like um- Brian said also like you can- you can predict a weight or something. but it won't be so accurate, or you can ADD something to a weight and predict what it will be. **
33 T: OK
34 Em: You know when. Brian said like it will be ‘predict’ what the weight is if you added feathers, I sort of agree and sort of don't. because it's also um estimating the weight or the mass because you're <just adding> something but you still have to estimate the mass, you're not really predicting what will happen
35 T: Yes, she picked- your example is not a very good example- (to Brian)
36 Br: Um. I-I-
37 T: - because she says it's still ABOUT the tennis ball it's not about what will HAPPEN to the tennis ball.
38 Br: Yes, but I'm saying that ‘predicting’ is not predicting the MASS that it will be, I'm saying that- PREDICT whether it will be the same. mass or will it change
39 T: OK. right. any more comments on this issue?
   Yes (to Emma)
40 Em: Well, yes, he is right if you say predict if it will be same or different or, for example, will the mass increase, decrease or be the same. but then if- yeah that's right - but then if you add- like estimate the weight after you add those things you're still using `estimate`.
41 T: OK
42 Je: And my answer is sort of like Emma's but um if she-she- Brian said that it was um asking a question um er he said he'd add two feathers. on to a tennis ball and predict what the mass will be. um well it would the- um- if you were to predict if the mass would be the same, increase or <decrease>**, you would ask it in a different way though, you'd ask. `What. d'you think will happen. or. to the mass
43 T: What d’you think would happen-
44 Je: - to the mass if I add two feathers?
45 T: Is that a prediction? ‘What d’you think will happen?’
46 [Several children say yes]
47 Je: You wouldn’t ask- like-
48 T: If you ask what would be the new mass then, what would that be?
49 Ss: Estimation

Perhaps the most striking feature of this extract is the extent to which these nine-year-old students are able to contribute extended statements of their understanding of the relationship between the three abstract terms. They are also able to anchor their positions in relation to Peter’s - unacceptable - claim that the three terms are essentially synonymous. Then, as the discussion develops, other students’ contributions also provide building blocks for the collaborative attempt to refine the distinction. There is certainly a considerable amount of repetition but this occurs because each student is using the speaking turn to try to formulate his or her current understanding and, in so doing, is drawing on what others have already said. Having listened to Frances, for example, Emma sees the issue they are considering in a new light and, without waiting to be nominated, she initiates a new sequence:

I sort of agree with Frances that before I would have estimated, it would have been ABOUT the object, like, for example, the ball - about the ball - but then ‘predict’ is like what will HAPPEN. if you do something to the ball, so I will now use ‘predict’

Particularly interesting is the distinction made by Brian in turn 29. Initially, the teacher does not seem to have taken his point for, in 35 she gives support to Emma’s argument that Brian’s example of considering the change in mass that would result from adding feathers to the tennis ball would not be a case where ‘predicting’ would be appropriate. However, he rejoins that there is a difference between predicting if something about the mass will change as opposed to estimating the mass that will result from the action of adding feathers (38). Taking up Brian’s distinction, Emma and Jenny discuss it further and, having got the point, the teacher
intervenes by asking two known answer questions (43, 45 and 48) to bring the whole class back into the discussion.

In sum, this is a productive discussion that really engages the class in distinguishing the significance of the terms ‘estimate’ and ‘predict’ as they are used in the context of inquiry activities in science. Bereiter (1994) calls this kind of collaborative talk "progressive discourse", which he defines as discourse that attempts to reach "a new understanding that everyone involved agrees is superior to their own previous understanding" (p.6). In our view, there is little doubt that this is what was achieved in this episode and, as we know from the previous lesson, this was exactly what the teacher was trying to encourage.

However, while clearly dialogic in the interanimation of different voices and perspectives, this extract still shows the key features of triadic dialogue: the teacher initiates many of the sequences and frequently contributes a follow-up move. On the other hand, there is a clear difference between this extract and the traditional recitation script in that, here, the role of ‘primary knower’ (Berry, 1981) does not reside in a single individual but is distributed among all participants, as successive speakers each offer their contributions. In this context, the role the teacher adopts is essentially that of manager or facilitator, selecting the next speaker when several are bidding, and trying to bring additional students into the discussion. In this role, her follow-up moves often merely acknowledge or summarize what has just been said and, when she does evaluate, it is to recognize the significance of the contribution to the joint enterprise rather than to evaluate its “correctness”.

Finally, we consider an extract from an episode in which students were asked to consider the arguments that likely preceded a key historical decision.

Extract 5. Strategic Planning in World War Two (HK, Grade 8)
As taught in schools, history is often presented as a succession of indisputable facts: key events occurred on particular dates and that is what is important to know. Where an explanation is provided, it is usually couched in synoptic terms; rarely are students invited to consider the multiple perspectives of the participants actually involved or to wonder how events might have turned out otherwise if some of the prevailing conditions had been different or particular individuals had made different decisions in the moment. In an attempt to engage students in imagining such alternative possibilities, some teachers of history suggest the use of role-played
reenactments of such critical moments, in which students, having already studied some of the factual information, are asked to imagine themselves in the roles of the major protagonists and to act and speak according to their understanding of their ‘characters’’ perspectives.

In this example, a grade eight class in a school serving a multicultural dormitory suburb is studying the second world war and, in the episode from which this extract is taken, the teacher is making an attempt to use this sort of approach by asking her students to consider the factors that would have had to be taken into account by the allied commanders in deciding when and how to launch what came to be known as the Normandy landing. The class has already read some relevant material and discussed it in small groups. Now, in a whole-class forum, they are drawing up the pros and cons for alternative ways of proceeding. At this point, the teacher is recording arguments on the blackboard as a formulation of each is agreed upon. She subsequently hands this task over to a student.

1 T: OK. Can anyone respond to Neil's point of not enough troops?
   .. people who think that we should raid- how do we get past the problem of not enough troops? Omar?

2 Om: Uhm- it's because they're fighting for their country so it doesn't really matter how many people die in the opposition . so- I guess that they are taking a chance when they are going to the air force base

3 T: OK- so so Neil has said that there are not enough troops- and your response....can you consolidate that? What are you saying in response to that?

4 Om: People come to war to fight . and ** for their country . because it means **

5 T: So- is it fair to say that you said that people come to fight- so you have to expect to lose men?
   [Several seconds of silence. David is holding up his hand]

6 T: OK? David?

7 Da: Uhm- I agree with him more although in a war you have to like think- go into a battle- like smartly . like you can't just go out and like commit suicide- like because it basically what you would do if you didn't have any
troops. and like- although you wouldn't have enough troops- as well- uhm- we have the advantage- because they don't know that we are planning this surprise attack. so- it would be all of a sudden by surprise and they would be in some manner taken by surprise

8 T: OK- do you want that listed as an original reason to attack?
9 [Several indicate ‘yes’ and T writes]
10 T: OK- see our connections? Neil is saying that we don’t have enough troops, so we shouldn’t be attacking. Omar just thought that people come to fight, we’re going to lose men anyway, so you know, the number of troops really doesn’t matter to us because we need to attack. David is supporting and saying well it’s a surprise attack anyway, so even if we don’t have enough troops, we may be OK because we are catching them off guard. [T continues to write]

See if you can link, OK?

11 Ra: Uhm- the one reason for a surprise attack is because like half the people is going to attack and half the men will leave or maybe talking around because they didn't know that they were supposed to keep that a secret.
[12 T writes on board]
12 T: OK- can you explain for anyone who is unclear on this. and why all these people were on leave and why they were or might have been talking?

13 Ra: Yeah- because they were beginning to like during the attack or something (inaudible) by attack. And they said that uhm leave because they needed rest like before they attack. Like they didn't know that they were supposed to keep a secret- so they told everyone.

14 T: Uhm Winnie
15 Wi: If we wait to attack- then the Germans will take over more places and then they'll just become undefeatable- and we'll have no choice against them

16 T: [writes] . Sareeka.
17 Sa: Uhm- going back to the beginning . er- they said that you're endangering lives of troops . but like- what you have to think about is billions of people
in the world that are like going to die from this. So it's like you can't just like think of the troops who are going to die. You like have to think of the outcome of this. Like our decision. And you have to think of all those billions of innocent people that are going to die. So then you should...

Clearly, this episode does not involve full-blown role-play; the students are acting more as ‘back-room advisors’ than as the main protagonists. However, they are making a serious attempt to imagine the sort of arguments that might have been made. The teacher, too, is taking their contributions seriously, acting as ‘chair’ and entering them as points for and against going ahead with the invasion in the matrix she has constructed on the blackboard. At the same time, however, she is playing a second, more instructional role as manager of the discourse. In this role, her purpose is to help her students to express their points of view clearly and in a manner that directly addresses the arguments involved in the decision-making process.

It is apparent that the students do not find the activity easy; the format is not a familiar one and the dual task of imagining the arguments that might have been made and formulating them as effective contributions to the debate is a challenging one. For this reason, the teacher judges it necessary to take a dominant role in the structuring of the discourse. However, as chair, she does not assume the role of primary knower with respect to the arguments for and against the attack. These arguments are contributed by the students in their roles as strategic planners. Nevertheless, the teacher is more than simply assigning speaking turns for, in her second role, she acts as primary knower with respect to the form the debate should take, in which positions are stated for or against the issue under consideration. Significantly, this role is not realized through direct instruction in sequence initiating moves but through her follow-up moves, which acknowledge each contribution and, through further questions, seek to obtain clearly stated arguments to be written in the decision chart. In many sequences, her final follow-up takes the form of a summary of the point that has been made or a review of several points and the relationship between them. In making these responsive contributions, she both helps the students to engage dialogically in their consideration of the arguments for and against proceeding with the invasion and also implicitly models the genre of formal argument, which is part of what she wants her students to learn in this curricular unit. It seems that she is to
some degree successful in this as the later contributions are more coherent in their arguments and are framed as attempts to support or refute earlier ones.

As with the preceding examples, this episode is not being presented in any way as an ideal exemplar of classroom dialogue. Rather, as with the others, it illustrates how one teacher, committed to adopting an inquiry orientation to curriculum, was, together with her students, feeling her way towards discursive activities that allowed knowledge to be constructed collaboratively through the interanimation of multiple voices in a search for greater understanding of the topic being studied. In our view, therefore, these examples taken together, despite their limitations, give clear evidence of a successful movement toward more dialogic modes of interaction in the creation of classroom communities of inquiry.

Discussion

Before moving into a discussion of the issues raised by the preceding extracts, it may first be useful to summarize the findings of the two types of analysis – quantitative and qualitative.

- Over the duration of the project, there was a sustained and successful attempt in these classrooms to adopt an inquiry orientation to curriculum and this, in turn, led to a more negotiatory and dialogic style of interaction.

- More specifically, there was a decrease in the proportion of sequences initiated by a teacher question and, correlatively, a significant increase in student initiation of sequences. Furthermore, when the teacher did initiate with a question s/he was more likely to request information for negotiation rather than known information; there was also a significant increase in the frequency of follow-up moves realized as requests for further (negotiatory) information. Also in the follow-up slot, there was a significant increase in the frequency of null evaluations, thereby allowing the discourse to proceed in a more dialogic style.

- Despite these departures from the ‘recitation’ mode of teacher-whole class interaction, the typical sequential pattern of discourse continued to be that of triadic dialogue, with the teacher exerting considerable control over the allocation of speaking turns. When interruptions to this pattern occurred, they tended to arise from the expression of conflicting points of view with respect to issues about which students felt strongly.
Nevertheless, as illustrated by extracts 4 and 5, there were, in addition, a number of quite lengthy episodes in which teacher-led extended stretches of dialogic interaction enabled participants to systematically explore an issue and work toward some form of conclusion.

In sum, from the results of the analyses taken as a whole, it is clear that an inquiry orientation to curriculum does make dialogue more likely to occur. They also show that the single most important action a teacher can take to shift the interaction from monologic to dialogic is to ask questions to which there are multiple possible answers and then to encourage the students who wish to answer to respond to, and build upon, each other’s contributions.

Clearly, then, it is possible to engage students in productive dialogue in relation to topics arising from the curriculum, and the preceding extracts give an idea of the range of forms such dialogue may take. However, these findings raise a number of questions of pedagogical significance that need to be further explored. For reasons of space, we shall consider only three:

1. On what grounds can it be claimed that dialogue gives rise to learning opportunities that are superior to those that are provided by the recitation script?
2. Given the major responsibility of ensuring that students master the content of the prescribed curriculum, how can a teacher create opportunities for classroom interaction to be dialogic?
3. What is the relationship between choice of discourse formats and the enactment of a dialogic stance?

Learning through Discussion

The arguments for the enactment of learning and teaching through purposeful, dialogic knowledge building have been developed at length in a number of recent works (Barnes, 1986; Mercer, 1996; Nystrand, 1997; Wells, 1999) and can be aptly summarized in the aphoristic statement that “knowledge is constructed and reconstructed in the discourse between people doing things together” (Franklin, 1996, quoted in Wells, 1999). In such discourse, as we have seen, there is the potential for three important features to work together synergistically.
First, when students are given the opportunity to participate in the cumulative construction of community problem solving they recognize that their contributions are consequential for the decision that is jointly constructed over successive turns. Where this affects their control over future actions, as in extract 1, it is easy to see why they are keen to express their opinions. But, as in extracts 4 and 5, this motivation can be extended to decisions about topics of a more impersonal and abstract nature. What seems to be important in either case is, first, that participants are invested in the outcome of the discourse and, second, that the outcome is not predetermined in advance.

The second feature is the collaborative nature of the enterprise. While competition can certainly be a motivator for cooperation (Hatano & Inagaki, 1991), it seems that there is an equal, if not greater, satisfaction to be gained through working with peers toward a jointly achieved outcome. Not only does this harness the social orientation of students’ interests, but it enables them to achieve together more than any of them individually could have achieved alone. This is particularly evident in extract 4. Furthermore, as (Dewey, 1916) argued, such early participation in collaborative decision making is essential for the maintenance of a society that claims to be democratic.

However, in the long term, the greatest benefit of collaborative knowledge building is the reciprocal development of understanding between individuals and the group. As Vygotsky (1981) noted, “the individual develops into what he/she is through what he/she produces for others” and it is in the effort to formulate our ideas for others that we most effectively clarify them for ourselves. This can be seen happening in all the extracts above. But, as Bakhtin (1986) argued, the effort to fully comprehend the utterance of another also involves uptake and an active, if only incipient, movement toward a response. It is therefore both in the act of ‘saying’ and also in that of responding to ‘what is said’ (that is to say, the text produced in the act of saying), that individuals actively participate in the building of a common understanding and simultaneously extend and refine their own (Wells, 1999).

All these features characterize the “progressive discourse” of productive intellectual communities, where, as Bereiter (1994) expounds the concept, the ideal is that participants are willing to revise their own opinions as they open-mindedly consider the proposals and arguments of others and that, over successive contributions, the common understanding thus jointly created is superior to that with which the participants started. In the same article,
Bereiter goes on to argue that this ideal can also be adopted in the classroom, for the knowledge that is jointly constructed does not have to be new in any absolute sense; “the important thing is that the [knowledge building] be progressive in the sense that understandings are being generated that are new to the local participants and that the participants recognize as superior to their previous understandings” (Bereiter, 1994, p.9).

In our opinion, it would not be unreasonable to claim that this sort of progressive discourse is occurring in all the preceding extracts, though only intermittently in the earlier ones, where the motivation is more that of interpersonal competition than that of knowledge building per se. However, as most scholars would agree, the advance of understanding is rarely free of competitive argument as individuals seek to make their own opinions prevail (Hatano & Inagaki, 1991). The important criterion is not a lack of passion, therefore, but a willingness to listen to alternatives and to adopt those that advance the collective understanding, whether this is action-oriented (as in extracts 1 and 2) or more conjectural or theoretical (as in extracts 3, 4 and 5). It is in this sense that a dialogic mode of learning and teaching has the potential to provide superior opportunities for the development of understanding than occurs in the monologic mode.

**Dialogue in the Context of Prescribed Curricular Outcomes**

Despite the obvious benefits of encouraging dialogic interaction in the classroom, it is frequently argued that, at best, dialogue is only appropriate when considering issues that are acknowledged to be controversial and, at worst, it interferes with the teacher-controlled instruction that is essential in order to “cover” the prescribed curriculum and to ensure that students are equipped with the knowledge for which they will be held accountable. These are arguments that need to be taken seriously, since they discourage many teachers from even attempting to create an atmosphere in which dialogue is possible.

In answer to the first objection, that of the limited range of topics about which dialogue is appropriate, it is worth pointing out that almost all of what is now taken to be assured knowledge was at some point – and in many cases still is – subject to disagreement and debate. To understand the conclusion that is currently accepted, therefore, it is necessary to be aware of the contending arguments and to consider them for oneself. Indeed, as Popper has argued:
We can grasp a theory only by trying to reinvent it or to reconstruct it, and by trying out, with the help of our imagination, all the consequences of the theory which seem to us to be interesting and important … One could say that the process of understanding and the process of the actual production or discovery [of theories] are very much alike. (Popper & Eccles, 1977, p. 461)

While it is clearly not feasible to engage in reenacting the original debates about all the now-accepted knowledge that students are required to learn (as proponents of the second argument above would insist), it is important, we believe, that students should have the opportunity to come to understand, through their own participation, that all knowledge of any scope is created through dialogue between alternative points of view, supported by argument from evidence, and subject to revision in the light of further evidence. In our view, therefore, the question is not whether dialogue has a place in the enactment of curriculum but rather in what ways this can be made possible and how it can be ensured that such dialogue is ‘progressive’ in Bereiter’s (1994) sense.

Answers to these latter questions will clearly differ according to the disciplines being studied and the age of the students. But, as Gallas (1995) demonstrates, worthwhile dialogue about topics that will later be taught in science classes is already within the capabilities of first graders. The first step toward productive dialogue, it would therefore seem, is to seize occasions that spontaneously arise to encourage students to express alternative points of view and to learn both how to provide supporting argument for their own perspective and to listen respectfully to, and attempt to understand, the perspectives and arguments of others. It may also be very worthwhile to devote time to explicit teaching of the social and discursive skills necessary for such dialogue, as has been demonstrated by Mercer and colleagues (Dawes et al., 2000; Wegerif et al., 1999).

Once these generic skills are on the way to being mastered, it is possible to bring them to bear in the different subject disciplines, as has been amply demonstrated by a number of subject specialists (e.g. Brown et al., 1994; Cobb & McClain, 2002; Lampert, 1990; Roseberry et al., 1992). O’Connor (2001) advocates engaging in “position-driven” discussion, started by a statement or question, in which students are invited to express justified agreement or disagreement. This can certainly be effective in cases where there is a conventionally agreed-
upon conclusion to be reached, as in her mathematical example: “Can any fraction be turned into a decimal?” Roth’s (2002) example concerning where plants get their food is rather similar. In such cases, a review of all the relevant evidence, properly understood, ultimately leads to a single conclusion. But, in disciplines such as history or literature, a single, determinate conclusion is not always attainable and a discussion that is organized in relation to a ”position” may not be the most appropriate way of exploring all the relevant perspectives. It seems clear that more research is needed to identify effective discussion starters in different curricular areas and practicing teachers are in a good position to conduct such investigations.

However, productive classroom discussion is not restricted to preplanned occasions such as those just discussed. Just as valuable are those that arise spontaneously from a student question or conjecture, or even from an “error” or “misconception” that leads to a discussion of basic principles in the discipline. Being alert to the potential of such occasions is clearly an equally important aspect of teaching that seeks to promote dialogue as the means to increasing understanding.

At the same time, such curricular-oriented dialogues enable students to make connections between the topics presented as important for their success in school and their personal experiences and concerns in the world beyond the school. As Lampert (1986) argues, [Students] need to be treated like sense-makers rather than rememberers and forgetters. They need to see connections between what they are supposed to be learning in school and things they care about understanding outside of school, and these connections need to be related to the substance of what they are supposed to be learning. (p. 340)

Adopting a Dialogic Stance

In answering the second objection above, it needs to be emphasized that it is not necessary for all lessons to be conducted in a dialogic mode for the class to be committed to a ‘dialogic stance’ toward the content of the curriculum (Wells, 2002). While the distinction between ‘monologic’ and ‘dialogic’ interaction provides a useful way of characterizing the dominant mode in which the discourse in different classrooms is organized, it is clear that this simple binary distinction is not adequate to account for the various ways in which teachers who aim to be ‘dialogic’ actually attempt to achieve this goal in relation to whole curricular units.
Consider the following brief extract from a grades 6/7 social studies unit on North American history (KM, Grades 6 and 7).

T: What did La Salle declare? Matthew?
Ma: The Mississippi river?
T: What about the Mississippi river?
Ma: All the water that flowed down-
T: What did he declare about it? er- Keith?
Ke: Well um he claimed that it was French um the ***
T: Right, that it now belonged to France. Who was the person who gave him the power to say that it did in fact belong to France? Fazad?
Fa: The king of France?
T: Yes. who was the king of France? Let's see who remembers this- er. Lillia?
Li: King Louis the:: something?
Sa: (whispered) thirteenth
[Many students mumble at once]
T: OK. its- Irene?- Louis the something?
Ir: Fourteenth?
T: King Louis the fourteenth. OK, good

From this extract alone, one might imagine that the teacher was involved in a traditional quiz, in which her chief concern was that the students should produce the correct answers. However, as the continuation of her follow-up move makes clear, the preceding extract was intended to serve a very different purpose.

T: So that's the sort of attitude that the British and the French had. They would come to the area that we now know as Canada and they would say “We claim this territory for our own.” And we talked a little bit about some of the battles that went on with Native peoples but we never really looked at it from their perspective. how the Native peoples felt about or reacted to the fact that these British soldiers or these French couriers de bois were coming in and saying 'this
land now belongs to .. to England or it now belongs to France'. And up until quite recently in .. in historical um- <stuff>- um in historical classes as well- people weren't too interested - or- there weren't a lot of materials around to help people find out about the Native people's point of view in terms of what happens to- um- to the land that they had lived on and occupied for a long long time

To evaluate this ‘monologic’ episode, it is clearly necessary to understand its context, which was that the class was preparing to role-play a hearing before the Supreme Court of Canada, in which an (imaginary) native band, the Wish’ga, were reclaiming title to their ancestral land from the government of Province West. Revisiting the French annexation of the land around the lower Mississippi was intended to help the students to recall the previous study they had made of the implications for Native peoples of European expansionist policies in order to better prepare them to construct arguments and counter-arguments for the cases of the competing parties in the Wish’ga claim. In other words, the reviewing of factual information already studied was judged by the teacher to be helpful for the students’ forthcoming historical inquiry into Native peoples’ experiences through a dramatic simulation constructed by the students.

Put more generally, the function that a discourse format serves on a particular occasion depends on the purpose of the activity in which it occurs and on how the activity is intended to contribute to the unit as a whole. Establishing “common knowledge” (Edwards & Mercer, 1987), for example, whether by eliciting information through known answer questions or by sustained exposition of some kind, is often a crucial preliminary step in an inquiry-oriented curricular unit, in order to ensure that students are well prepared to make good use of the open-ended and explicitly dialogic activities that are to be the heart of the unit.

In fact, in the early observations in the project reported here, the small number of episodes that included dialogic stretches of interaction occurred exclusively when the class was planning future activities. In the late observations, by contrast, episodes including dialogic sequences occurred when making sense of already gathered information, either in speech or in some form of written representation, or in reviewing what had been achieved over the course of previous activities. It would seem, therefore, that – as already suggested – in the early
observations in the DICEP project, when dialogue occurred, it erupted spontaneously when
students felt strongly about proposed actions, whereas, in the later observations, it was more
deliberately planned for in the way in which teachers involved students in interpreting and/or
commenting on information or experiences arising from preceding activities.

A second factor that plays an important role in a teacher’s choice of a dialogic format is
the extent to which students are familiar with the format in question and willing to take the risk
of making a contribution that may not be judged by peers (or teacher) to advance the topic
under discussion. While this is still a relatively new demand for the students, a teacher may
choose to act as initiator of most sequences in order to elicit contributions from less vocal or
less confident students and to ensure that all those who want to contribute are given a turn.

But probably the chief reason for teachers choosing a format in which they retain
control of the floor is the same as for the chair of an official meeting: to keep discussion on
track and, in Bereiter’s (1994) sense, ‘progressive’. Evidence for this explanation can be seen
in some of the follow-up moves they make in the presented extracts, as they summarize - and
in some cases reformulate - what has been said in order to establish a clear basis for
development or disagreement. Such moves occurred in all the episodes from which the five
extracts above were taken and, in the case of the social studies unit on Native peoples’ land
claims, when asked at the end of the unit, the students said they appreciated the teacher’s tight
structuring of the review of the material encountered earlier in preparing them to construct the
cases they were to present to the Supreme Court (Kowal, 2001).

However, keeping control of the floor does not necessarily entail also keeping control
of the content of the discussion. While it is almost always the teacher who proposes the topic
of an episode and brings it to a conclusion, the topics of individual sequences are often selected
by the students, as they propose alternative perspectives on the issue that is “on the floor” or
react to preceding contributions by their peers. Confirming this claim is the fact that, in the
episodes that have a dialogic “feel” among those analyzed here, the proportion of sequences
initiated by a substantive teacher question is lower than in other episodes; instead, the teacher
initiation is often limited to selecting the next speaker and implicitly giving him or her the right
to select the topic (e.g. as in extracts 3 and 4). It is also noticeable that many student
contributions received no evaluation by the teacher, but simply an acknowledgement. It was
then at the discretion of the next selected student to decide whether or not to respond to what
had just been said. As can be seen in several of the extracts, students were aware of the expectation that they would connect their contribution to those of others and were doing so very explicitly and sometimes very cogently as well.

In sum, we believe, there are good grounds for arguing that the various teacher-led discourse formats found in the above extracts and in several other episodes amply justify characterization as ‘dialogic.’ Not surprisingly, given the inquiry orientation of the project, these formats occurred significantly more frequently in the later observations than in the early ones, as the teachers experimented with ways of making interaction in whole-class settings dialogic in practice as well as intent. At the same time, they were equally concerned to ensure that their students worked toward mastery of the knowledge and skills – the required ‘outcomes’ --specified in the curriculum for which they were responsible. As illustrated above, they used monologic discourse formats when they considered them to be appropriate for the task in hand but without abandoning their overall dialogic stance (Wells, 2002).

Nevertheless, given the teachers’ commitment to a dialogic stance, it may be surprising to some readers that triadic dialogue was still so pervasive throughout the corpus analyzed here. As discussed above, however, there are good reasons for teachers to use some variant of this genre. Where large numbers of participants are involved, as in most classrooms from kindergarten to university, it is important to have generic discourse structures to which all participants orient, so that discussion can be orderly and, ideally, progressive. The IRF sequence clearly fits this requirement. What matters for the quality of interaction, it seems, is not so much how the sequence starts, but how it develops and this, as we have argued, depends critically on the teacher’s choice of roles and on how he or she utilizes the follow-up move.

There is also a second probable reason for the persistence of this genre, and one that is quite compatible with the inquiry orientation to which our group is committed. At a macro level, the IRF structure can be seen to aptly characterize the teacher’s major responsibilities. As the participant primarily responsible for the classroom community’s engagement with the prescribed curriculum, the teacher selects and prepares curriculum units and launches them in ways designed to provide appropriate challenges for each student member. This is the Initiation. Students, in turn, are expected to Respond by taking up some of the challenges presented and by attempting, either alone or in collaboration with others, to go beyond their current understanding or level of skilled performance. The teacher’s Follow-up then consists in
responding to the students’ attempts by providing assistance in a manner that jointly creates a zone of proximal development that enables them to "go beyond themselves" (Vygotsky, 1987) in relation to the challenges that they have taken up and to which they are personally committed. Viewed from this perspective, the IRF discourse genre - when appropriately used - can be seen as playing out at the more micro level of the co-construction of meaning the same fundamental responsibilities as are involved in organizing the more macro level activities in which the students are engaged.

However, to recognize the pedagogical effectiveness of particular sub-genres of triadic dialogue is not to give a positive endorsement to the genre as a whole, for all purposes and in all situations. As we have argued above, it is important to distinguish between the various forms triadic dialogue can take and to evaluate particular instances in terms of the goals of the activities in which they are used. It is also necessary to ensure that, over longer periods of time, such as complete curricular units, the balance of discourse formats chosen supports the development of an ethos of dialogic inquiry in the classroom and, with this, the development of a disposition of respect for diversity of experience and difference of opinion, and a desire to increase understanding of the topics and issues that are seriously raised, whoever the originator. Thus, rather than inveighing against the persistence of this genre in teacher-whole class interaction, as for example Wood (1992) and Lemke (1990) have done, we suggest that it would be more productive for educators to try to understand the ways in which its underlying structure can be adapted to meet the varied demands of the pedagogical relationship, so that we can more fully exploit its potential to lead to a more exploratory, dialogic mode of knowledge construction.
References


responding with curricula. New York: Teachers College Press.


Appendix

CODING SCHEME FOR THE ANALYSIS OF CLASSROOM DISCOURSE

(Summary)

Gordon Wells with DICEP

<table>
<thead>
<tr>
<th>Column</th>
<th>Field</th>
<th>Categories</th>
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<td>2</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>P Science Practical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S Science Discussion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D Science Presentation</td>
</tr>
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<td>O History Practical</td>
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<td>H History Discussion</td>
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<tr>
<td></td>
<td></td>
<td>R History Role-Play</td>
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<tr>
<td></td>
<td></td>
<td>L Literature Discussion</td>
</tr>
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<td></td>
<td></td>
<td>B Reading Discussion</td>
</tr>
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<td></td>
<td></td>
<td>W Writing Discussion</td>
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<tr>
<td></td>
<td></td>
<td>T Show and Tell</td>
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<td>3</td>
<td>Participant</td>
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<tr>
<td></td>
<td>Structure</td>
<td>G Group</td>
</tr>
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<td></td>
<td>D Dyad</td>
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<td>4</td>
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<td>Orientation</td>
<td>O Organizing</td>
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<td>P Planning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T Reporting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S Problem-Solving</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G Generating</td>
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<tr>
<td></td>
<td></td>
<td>L Launching</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B Constructing</td>
</tr>
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<td>F Formulating</td>
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<td>M Monitoring</td>
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<td>Sequence #</td>
<td>1 - n</td>
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2 A full version of the coding scheme is available from the first author on request.
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<td></td>
<td>A Adds</td>
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<td></td>
<td></td>
<td>E Extends</td>
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<td>S Consolidates</td>
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<td></td>
<td></td>
<td>C Challenges</td>
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<td>R Shifts to related.</td>
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<td>O Relationship opaque</td>
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<td>8</td>
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<td>&amp;N Additional Nuclear</td>
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<td>10</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>R Rote recall</td>
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<tr>
<td></td>
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<tr>
<td></td>
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<td>M Memory/Prior Knowledge</td>
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<td></td>
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<td>G Generalization</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>N New student</td>
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<td>12</td>
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<td>D Demand</td>
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<tr>
<td></td>
<td>Prospectiveness</td>
<td>G Give</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G+ Give Plus</td>
</tr>
<tr>
<td>13</td>
<td>Demand</td>
<td>D Action</td>
</tr>
<tr>
<td></td>
<td>Subcategories</td>
<td>F Full Clause (or more)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FI Full (Implicit)</td>
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</table>
C Single Constituent
CI Single Constituent (Implicit)
A Choice of Alternatives
AI Choice of Alternatives (Implicit)
P Polar (Yes/No)
PI Polar (Implicit)

14 Give
Subcategories
E Extended Response
C Single Constituent
A Alternative
P Polar (Yes/No)

15 Initiation Function
Information: Assumed Known
F Fact
A Rule-governed answer
J Conventional explanation
R Report of public event
L Connection
Information: Personal
E Experience
I Imagination
N Personal Opinion
K Exclamation
Information: For Negotiation
O Opinion
P Prediction
X Explanation
C Conjecture
B Connection
Goods & Services: Assumed Known
D Act
Goods & Services: Personal
G Intention
Goods & Services: For Negotiation
S Suggestion
Q Clarification Request

16 Responder
T Teacher
S Same student as in previous exchange
N New Student
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<td>Y</td>
<td>Confirm/Disconfirm</td>
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<td></td>
<td>U</td>
<td>Stall</td>
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<td></td>
<td>W</td>
<td>Exclamation</td>
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**Information: Assumed Known**

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<td>R</td>
<td>Report of public event</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>Conventional explanation</td>
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**Information: Personal**

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<td>I</td>
<td>Imagination</td>
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<td></td>
<td>N</td>
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**Information: For Negotiation**

<table>
<thead>
<tr>
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<td>Explanation</td>
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<td>C</td>
<td>Conjecture</td>
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<tr>
<td></td>
<td>B</td>
<td>Connection</td>
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</table>

**Goods & Services: Assumed Known**

<table>
<thead>
<tr>
<th></th>
<th>D</th>
<th>Act</th>
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**Goods & Services: Personal**

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**Goods & Services: For Negotiation**

<table>
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<tr>
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<th>S</th>
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**Clarification Request**

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**M | Cite text (e.g. cite a question)**

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<td>Main clause (+ dept. clause)</td>
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<td></td>
<td>3</td>
<td>Three or more clauses</td>
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<td>T Teacher</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S Same student as in previous exchange</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N New Student</td>
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</tr>
<tr>
<td></td>
<td>A Other Adult</td>
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<td></td>
<td>R Reject</td>
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<tr>
<td></td>
<td>G Give</td>
</tr>
<tr>
<td></td>
<td>D Demand</td>
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<td>G+ Give+</td>
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<td>Follow-up Question</td>
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<td>Low</td>
<td>Accept + Praise</td>
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<tr>
<td></td>
<td>J Reject + Justification</td>
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<tr>
<td></td>
<td>L Accept/Reject</td>
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</table>

<table>
<thead>
<tr>
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<td>C Comment</td>
</tr>
<tr>
<td></td>
<td>U Clarification</td>
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<tr>
<td></td>
<td>A Action</td>
</tr>
<tr>
<td></td>
<td>M Metatalk</td>
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</table>

<table>
<thead>
<tr>
<th>Follow-up Subcategory (Contingent on choice of Commodity)</th>
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<td>Evaluation</td>
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<td>F Reformulate</td>
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<td>D Counter</td>
</tr>
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<td>Y Repeat (accept)</td>
</tr>
<tr>
<td>N Repeat (reject)</td>
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<td>P Praise</td>
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<table>
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<td>A Amplification</td>
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<tr>
<td>C Connection</td>
</tr>
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<td>S</td>
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<td>O</td>
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<td>L</td>
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</tbody>
</table>

### Action

- **N** Now
- **F** Future
- **S** Suggestion

### Clarification

- **R** Repetition
- **I** Identification
- **C** Confirm

### Metatalk

- **C** Metacognitive
- **O** Metaorganizational
Notes

1 As explained below, we adopted the term ‘Follow-Up’ for the third move and refer to the three-part structure as I-R-F.
2 This paper is based on work carried out between 1991 and 2004 with members of the “Developing Inquiring Communities in Education Project” (DICEP) in Toronto, with support from the Spencer Foundation, and with colleagues and students at the University of California, Santa Cruz. We are grateful to them for the many discussions we have had about the nature and importance of dialogue in the classroom. In particular, we wish to acknowledge the contribution of Erica Camalich in helping to analyze the data on which the results presented in this paper are based.
3 Like Halliday, Lotman uses “text” to refer not only to written texts, but also any instance of language being used on a particular occasion.
4 Similarly, Lave and Wenger (1991) argue that learning is not a separate activity but an intrinsic aspect of participation in a community of practice.
5 A much fuller account can be found in Nassaji & Wells (2000).
6 These three categories are rather similar to Halliday’s (1978) three dimensions of register: field, tenor and mode, respectively.
7 The teachers involved in the project taught classes ranging from grade one to grade eight. Some taught in inner city schools and some in suburban schools but, while the proportion of recent arrivals in Canada was greater in the inner city schools, all the classes included students for whom English was a second language.
8 Coding of linguistic data cannot be an entirely objective process, since a high proportion of moves are open to more than one interpretation. Rather than carry out and report a test of intercoder reliability, therefore, we chose to have one coder make the final decision in the case of disagreement. The number of such disagreements occurred on less than 5% of the total number of coding judgments made.
9 A little later, however, Nir persuaded the class that, since one of the chrysalises had fallen from its hanging position, it could be assumed to be dead. On these grounds, it was agreed that he could carry out an autopsy. (For further details of this teacher’s move toward inquiry, see Wells, 1993)