Using the Tool-Kit of Discourse in the Activity of Learning and Teaching

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To cite this article: Gordon Wells (1996) Using the Tool-Kit of Discourse in the Activity of Learning and Teaching, Mind, Culture, and Activity, 3:2, 74-101, DOI: 10.1207/s15327884mca0302_2

To link to this article: http://dx.doi.org/10.1207/s15327884mca0302_2
Teaching and learning are largely conducted through talk, yet the relationship between the talk and the activity goals it is intended to achieve is rarely problematized or treated as a matter for conscious choice. In this paper, I describe a tool for the analysis of classroom talk, developed in the context of teacher-researcher collaboration, which draws upon activity theory and systemic linguistics. Three main units of analysis are proposed: episodes of talk, which are the chief interactional means by which actions are operationalized; the sequences from which such episodes are constructed; and, minimally, the moves through which each sequence is negotiated. The concept of mini-genre is then used to distinguish different patterns of sequential organization. In the second part of the paper, I contrast episodes from two different activities, showing how different choices of follow-up moves create significantly different kinds of opportunity for student engagement and learning. In conclusion, I suggest that, by recording and analyzing episodes of talk from their classrooms, teachers can become conscious of the options they select; then, if they see fit, they can, by changing the discursive operations deployed, bring about a change in the activities themselves and so change the nature of the classroom community.

Schooling, as a form of socialization through culture-transmission, has been part of our culture for so long that we take for granted its decontextualized, encapsulated nature and its almost total dependence on oral and written discourse. Add to this an uncritical acceptance by many educators of the conduit metaphor of communication, in which utterances carry thoughts as trucks carry coal (Reddy, 1979), and it is perhaps not surprising that many attempts to understand the role of language in learning and teaching have treated the verbal component of classroom events as self-sufficient, and analyzed the talk as if, like a window, it gave direct access to what was going on in the learners' minds (Edwards, 1990).

But what if this view of learning as the increasing ability to send and receive verbal messages containing more, and more complex and abstract, information about non-present objects and events is an aberration — a byproduct of the form that schooled learning has happened to take in Western
culture? In many other cultures, learning is not treated as a separate activity; and, even in our own culture, this is rarely the case outside the classroom. Instead, it is recognized to be a concomitant of engagement in joint activity with help from other people. Nor, outside the classroom, is learning conceived of as a purely verbal affair. For simply being able to talk about a practice is no substitute for being able to engage in it effectively. Talk is a means, not an end in itself, and verbal information is valued not for the correctness of the way in which it is formulated but for its use as a means towards the achievement of some larger purpose. What we need to attend to, therefore, in order to understand the role of talk in the classroom, is not so much the talk per se, as the contribution it makes to the activities in which students engage in the "lived-in world" of the classroom, the actual structures of participation, and the functions that talk performs—along with other semiotic systems—in mediating the goals of these activities.

This is the approach that our research group of teachers and teacher educators has been taking as, through collaborative action research, we attempt to improve students' opportunities for learning through the development of classroom communities of inquiry. However, in order to analyze the video recorded observations that provide the primary data for our research, we found we first had to devise a more adequate analytic framework: one that focuses not only on the turn-by-turn organizational structure of talk described by conversational analysts (Sacks, Schegloff & Jefferson, 1974) and discourse analysts (Sinclair & Coulthard, 1975), but also on the different functions that talk performs in enabling, interpreting and evaluating the joint activities of which it is a part. Only when conceptualized in this sort of way, we believe, can the study of classroom interaction make a significant contribution to our understanding of learning and teaching in schools and other educational institutions, and help teachers to use the discourse tool-kit most effectively to facilitate their students' learning.

Briefly, the framework we have developed is based on an articulation of activity theory and systemic linguistics, which will be explained in the first part of the paper. Then, in the second part, through the examination of two particular episodes, I shall try to show how the framework can be used to arrive at a fuller understanding of the role of discourse in the practice of education, and to identify points of leverage for those teachers who wish to find ways of changing their practice in the interests of bringing it into closer touch with the world of relevant social action (Bruner, 1990).

Part 1. Developing the Framework: The Primacy of Activity

Our starting point is the tri-stratal analysis of joint activity developed by Leont'ev (1981) on the basis of ideas initially proposed by Vygotsky. The three strata are those of Activity, Action and Operation, each of which provides a different perspective on the organization of events. In any event-in-a-setting, the ‘Activity’ that is being undertaken can be identified according to its motive—the “object” in view that provides its driving force. In the classroom, the predominant activity is that of education, although, in practice, the object of this activity takes a range of varied, and sometimes mutually incompatible, forms. In educational discourse, however, the term “activity” is typically used in a non-technical sense to refer to a relatively self-contained curricular event, often occupying one time-tabled lesson; so, in order to avoid terminological confusion, I shall from here on refer to the stratum of ‘activity,’ as it applies to education, as the Practice of Education.¹

The second stratum is that of ‘Action,’ which is the perspective on an event which is afforded by considering the goal to be achieved. It is only in ‘action’ that an ‘activity’ is “translated into reality.” But even the stratum of ‘action’ is not directly tied to actual behavior. For that, we must invoke the third

¹ Using the Tool-Kit of Discourse
Gordon Wells
stratum, that of 'Operation,' where the focus is on the particular means that participants use to achieve the goal of the 'action' in view, under the conditions that prevail in the situation.

In distinguishing between the strata of 'action' and 'operation,' Leont'ev also introduces a second criterion. An 'action,' by virtue of being goal-directed, requires that the actors give it their conscious attention. One of the defining features of an 'operation,' by contrast, is that, as a means for achieving the goal of 'action,' it is likely to be a well-practiced routine, and therefore no longer in need of conscious attention. A corollary of this second distinction is that a pattern of behavior that starts as an 'action' may, over time, become so routinized that it becomes an 'operation,' to be deployed, when appropriate, in the achievement of a more molar 'action.'

However, the reverse movement can also occur. When difficulty is encountered in performing an 'operation,' it may be necessary to refocus on the 'operation' and attend to it once more as an 'action,' until it again becomes automatic. In the classroom, such a "stepping up" may be instigated quite deliberately when the teacher recognizes that an 'operation' is not being carried out appropriately.

In sum, then, what I am suggesting is that classroom events are best understood as 'actions' which, organized as structured sequences of activities and tasks, enact the Practice of Education. However, whilst 'action' provides the organizing structure for classroom events and for the goals and outcomes in terms of which they are planned, directed and evaluated, it is the stratum of 'operations' that accounts for the means by which these goals are attained. That is to say, at a level below full conscious attention, participants select from their repertoire of routinized behaviors the ones that, in the light of the prevailing conditions, they judge appropriate for the activity or task in hand and deploy them relatively automatically towards the achievement of that end.

Activity Systems and Communities of Practice

In the foregoing account, I have emphasized the realization relationship between the three strata but, like Leont'ev, have said little about the ways in which an 'activity,' and the 'actions' through which it is realized, is embedded in the cultural context in which it occurs. In the last decade, however, there have been a number of important proposals which situate 'activity' more dynamically in a world of interacting, self-renewing communities of practice (e.g., Lave & Wenger, 1991). For our purposes here, perhaps the most important is the construct of an activity system developed by Engeström (1990).

Following Leont'ev, Engeström takes as his point of departure the basic mediational triangle, in which the incorporation of the tool as mediational means radically transforms the relation between a subject and the object of his or her 'action.' However, this model needs to be expanded, he argues, in order to understand the relationship between such isolated 'actions' and the ongoing cultural 'activities' in which they are embedded. This enlarged model he represents as in Figure 1 (opposite).

In this expanded model, the individual 'action,' represented by the top portion of the diagram, is related to the larger cultural and historical context by the relationships represented by the other triangles. For example, the subject-object relationship—that is to say, the subject's goal orientation—is modified by the cultural rules that apply to this relationship and by the division of labor in which it is embedded. These rules, or norms, might well include the tools considered appropriate to use, and the way in which control of their use is distributed among the different categories of community members who are regularly involved in this and related 'actions.' However, these relationships are not static; they are continuously being constructed and reformulated in the course of their deployment in particular, situated 'actions.'
In the present context, one of the particular virtues of this model, as I hope to show below, is that it enables comparisons to be made between quite different ways of enacting the practice of education and encourages a critical and innovative approach to teaching (Engeström, 1991). It also draws attention to possible points of leverage in the attempt to overcome the encapsulated nature of schooling. For example, changing the nature of the rules that prescribe the sorts of ‘actions’ that participants engage in and their intended outcomes, modifying the division of labor, or valuing other semiotic tools in addition to written texts, all create quite different ‘activity systems,’ and ones that may encourage rather than resist student initiative and creativity.

**Discourse as Semiotic Tool**

Within this ‘activity’ framework, discourse is seen as a tool-kit that is drawn on in achieving the goals of ‘actions’ and ‘sub-actions’ (or, in classroom terms, the goals of activities and their constituent tasks) (Cole, 1995, Wertsch, 1991). This perspective is quite similar to that found in Halliday’s systemic functional theory of language (Halliday, 1978; 1984) and, for this reason, our approach to the analysis of discourse draws heavily on his writings. As Leont’ev argues, tools have a central role in the theory of ‘activity,’ for “the tool mediates activity and thus connects humans not only with the world of objects but also with other people” (1981, p. 55). And as Halliday (1993) points out, as a semiotic tool, language is admirably organized for this purpose, for any individual act of meaning simultaneously performs two functions. First, a speaker’s choices with respect to what he calls the ‘ideational’ metafunction encode the aspect of experience (including the “world of objects”) that she or he is representing and, second, choices with respect to the ‘interpersonal’ metafunction encode the speaker’s relation to his or her interlocutors.

Acts of meaning do not occur in isolation, however, but as dialogic contributions to discourse—or “text,” in Halliday’s terms. That is to say, they occur in the course of an exchange of meanings between participants in order to perform some function(s) in a specific situation. It is thus texts rather
than individual acts of meaning that constitute the tools that are used in mediating ‘activity.’ In order to articulate this functional theory of discourse with the theory of ‘activity,’ therefore, it is necessary to specify briefly how texts are constructed and then to consider the relationship between the analytic categories of the two theories. In the present context, I shall focus only on spoken texts. But the same general arguments also apply to written texts; as Bakhtin (1986) emphasizes, they too mediate ‘activity’ and they are also dialogic.

Categories for the Analysis of the Sequential Organization of Discourse

In the co-construction of a text, the smallest building block is the Move, for example a “question” or an “answer.” However, it is the Exchange—in which such reciprocally-related moves combine—that constitutes the minimal unit of spoken discourse. Every exchange consists of an Initiating move and a Response move (either of which may on occasion be non-verbal); under certain conditions, there may also be a third, Follow-up, move. Exchanges are of two types: Nuclear exchanges, which can stand alone, independently contributing new content to the discourse, and Bound exchanges, which—as the label implies—are not free-standing, but depend on the nuclear exchange in some way. The most important of these is the Dependent exchange, in which some aspect of the nuclear exchange is developed through further specification, exemplification, justification, and so on. A second category of bound exchange is the Embedded exchange, which deals with problems in the uptake of a move in the current exchange, for example, the need for repetition or identification of a referent. (These are what Jefferson (1972) refers to as “side sequences.”) A further bound category is the Preparatory exchange, such as the Bid-Nomination exchange in whole-class question-and-answer sessions.

The unit that includes a single nuclear exchange and any exchanges that are bound to it is called a Sequence. In understanding the role of talk in joint activity, it is this unit which is of greatest functional significance. For it is in the succession of moves that occurs in following through on the expectations set up by the initiating move in a nuclear exchange that the “commodity” being exchanged—some form of goods or services, or some form of information (Halliday, 1984)—is introduced, negotiated and brought to completion.

Above Sequence is the level of Episode, that is to say, all the talk that occurs in the performance of an activity or—more probably—of one of its constituent tasks. It seems quite likely that it will eventually be possible to distinguish different subcategories of sequence according to their function within an episode (Coulthard, 1977) but, as yet, we have no firm proposals to make on this issue. The relationship between the four levels can be shown schematically as in Figure 2 (opposite), where dotted lines and parentheses indicate a category that is not obligatory.

The constituent structure described above is only one part of what is involved in giving a text its unity and coherence. Other important resources include cohesion (Halliday & Hasan, 1976) and what Lemke (1990) calls thematic patterning. Because of space limitations, these systems will not be further described here. However, a detailed account of their interrelationship in the creation of textual coherence can be found in Martin (1992).

It is important to emphasize, furthermore, that the account of the organization of discourse just presented is both schematic and idealized. Actual examples of discourse are often much less tidy: participants may be involved in more than one conversation simultaneously; responses do not always immediately follow initiations, and there may be more than one response; and moves and sequences may—and usually do—perform more than one function (cf. Labov & Fanshel, 1977). Furthermore, not
all meaning is expressed lexico-grammatically—intonation, gesture, etc. also contribute to the meanings exchanged. It seems, nevertheless, that this scheme—or something like it—has a normative function; as with Grice’s (1975) “cooperative principle,” it is because all the members of a speech community share very similar expectations that they are able to make sense of what actually occurs. (For a fuller discussion, see Wells, 1981, chapter 1.)

Describing Discourse in the Classroom: Relating Action and Genre

Let us turn now to the way in which sequences, and the episodes that contain them, might be related to the situations in which they occur. Systemic theory provides two perspectives on this relationship. The first is referred to as Register, which Halliday (1975) defines as “a particular configuration of meanings that is associated with a particular situation . . . the range of meanings that is activated by the semiotic properties of the situation” (p. 126). These properties, he proposes, can be grouped into three clusters, which provide the dimensions in terms of which particular situations can be classified according to type. The three dimensions are: Field (what is going on), Tenor (the participants, their roles and statuses), and Mode (the part that language plays in the event). Each of these dimensions maps on to one of the semantic metafunctions of the language system, respectively, Ideational, Interpersonal and Textual, and it is this mapping that accounts for the predictability that obtains between situations and the texts that are constructed in relation to them. Thus, the meanings that are exchanged when a group of students is carrying out a science experiment, and the forms in which they are realized, are likely to be rather different from those that occur when the teacher joins the group, or when the results are subsequently being represented in tabular form or in a written report (cf. Wells, 1993a for an analyzed example). However, it is important to emphasize that the relationship is bi-directional. As Halliday (1978) puts it: “The context plays a part in determining what we say; and what we say has a part in determining the context” (p. 3).

The second perspective provided by systemic theory is that of Genre. A genre, according to Martin et al. (1987) is a “staged, goal-oriented, social process,” and for Christie (1991) genres are
“purposive ways of doing things in a culture, and in that sense may be thought of as artifacts of the culture” (p. 205). Hasan (1985) gives the example of making a purchase in a fruit and vegetable store. This genre consists of certain elements, such as sale inquiry, purchase, etc., which are obligatory and fixed in order; other elements, such as greeting, are optional, and some may be recursive.

One way of understanding the relationship between these two perspectives is that register accounts for the sorts of things that are likely to be said in particular types of situation, and genre accounts for the sequential organization of what is said in order to achieve the goal of the ‘action’ in the situation. Together, they define what things can be done in a culture, and how, with the use of the semiotic tool-kit of language. At present, however, these perspectives are still somewhat programmatic in nature. They provide a way of thinking about the relationship between texts and situations, but not yet a taxonomy that is ready-made for use in the analysis of naturally occurring data (but cf. Lemke, 1990; Martin, 1992).

The next step is to articulate this approach to the analysis of discourse with the categories proposed by ‘activity’ theory in order to construct an analytic tool for the description of classroom events that is more powerful and comprehensive than that which is provided by either theory alone.

The most obvious point of intersection between the two theories is to be found in the notion of “goal-oriented social process.” As we have seen, this is the way in which both ‘action’ and genre are conceptualized. Both are concerned with patterned ways of doing things that are culturally recognized; both are structured in terms of the goal in view; and both require for their realization the strategic deployment of relatively routinized forms of behavior that are appropriate to the prevailing conditions. In fact, the two categories seem to be almost identical, differing only in the extent to which the focus is specifically on the linguistic processes involved. This is the perspective adopted in Lemke’s (1990) study of science classrooms, where he uses the term “genre” more or less interchangeably with the term “activity” in describing such recurring constituents of lessons as “seatwork,” “going over homework,” “teacher exposition,” or “teacher-student debate.”

This naturally raises the question as to how these two categories of ‘action’ and genre should be related. The answer we have adopted is suggested by focusing on the tool-like nature of discourse. As Cole (1995) puts it, drawing on a strong tradition in sociocultural theory, language is the “tool of tools.” It allows us both to intervene in social action to shape and direct it, and also to represent that action and the world in which it occurs in a “theory of human experience” (Halliday, 1993, p. 97). On this basis, I shall propose that a genre is best thought of as a type of ‘action,’ but one that is viewed from the perspective of its linguistic realization. Or, to put it differently, genres are items in the linguistic tool-kit; they constitute the range of linguistic means whereby different kinds of ‘action’ are ‘operationalized.’

In attempting to further categorize genres as different types of ‘operation,’ a useful initial distinction to make is that between events in which the discourse plays a role that is ancillary to the ‘action’ goal to be achieved and those in which the discourse is itself constitutive of the ‘action.’ An example of the former would be the talk that accompanies and monitors the preparation of a meal or the carrying out of the practical part of a science experiment; in both these cases, it is the goal of the material action that is the focus of attention and the function of the discourse is to facilitate the achievement of this goal. By contrast, in events such as a committee meeting or a discussion in which the results of an experiment are interpreted and evaluated, it is the talk that is primary, and the goal is both established and achieved chiefly through the medium of the appropriate discourse. In this latter
situation, the distinction between ‘action’ and ‘operation’ is more difficult to draw. However, even here, it is useful to think of ‘action’ as focusing on the outcome to be achieved, and of ‘operation’ as focusing on the situation-specific ways in which the discourse is co-constructed as a means of achieving that outcome.

Although currently invoked to explain the functional-sequential organization of any kind of linguistic text, the concept of genre was first used by rhetoricians to categorize written texts. And certainly, the interpretation of genres as the means by which ‘action’ is discursively ‘operationalized’ seems particularly appropriate when thinking about written genres. As Bazerman (1994) shows, in his study of the different genres that are involved in the ‘activity’ of obtaining a patent, it is through the appropriate use of the relevant written genres that the constituent ‘actions’ are performed and the overall outcome achieved. However, oral genres may also function in similar fashion in certain activities that involve face-to-face interaction. For example, in the formal setting of a trial, there are such clearly defined genres as cross-examination of witnesses, the defense counsel’s closing speech to the jury, and the judge’s summing up of the evidence. In such cases, as Hasan (1985) suggests, there is a culturally recognized pattern to be followed, involving obligatory elements which must occur in a certain order.

In most face-to-face interactions, however, this sort of conformity to preexisting generic patterns of discourse organization is the exception rather than the rule—at least at the level of ‘action’ comparable to the written genres in the ‘activity’ of patent granting. For example, the deliberations whereby the jury arrives at a verdict constitute a recognizable ‘action’ in the overall ‘activity’ of trial by jury, but the cases must be rare in which these deliberations follow a pre-scripted pattern. The same is true of most classroom interaction. Recognizable ‘actions’—what are generally referred to as classroom activities—such as reviewing work done on a topic to date, or carrying out an experiment, occur with considerable frequency, but the discourse through which they are ‘operationalized’ does not follow the same pattern from one occasion to another; there are few, if any, obligatory elements, and a minimal degree of order in which occurring elements must be arranged (but, for an alternative view, cf. Christie’s (1993) description of classroom activities in terms of “curriculum genres”).

Yet this does not mean that oral discourse is usually random and disorganized. If it were, it would be ineffective in enabling the goals of collaborative action to be achieved. Rather, the organizational structures to which participants orient operate at a lower level, corresponding to the tasks and steps which make up the superordinate ‘action.’ In other words, where ‘action’ is realized through oral discourse, the generic patterns through which it is ‘operationalized’ are most frequently to be found at the levels of sequence, rather than at the superordinate level of episode.

What the choice of this unit of analysis brings out is the essentially collaborative nature of oral text construction, in contrast with the more individually controlled creation or reception of a written text. For, although the ‘point’ of the sequence is typically proposed in the initiating move of the nuclear exchange (e.g., the offering of an interesting piece of information, a request for explanation, or the elicitation of suggestions), its satisfactory completion requires contributions by at least one other participant that appropriately meet the expectations set up by the initiating move. Furthermore, since there are many appropriate ways in which to respond to the initiating move—not all of them anticipated or anticipatable by the initiator—the precise meaning that is made in a sequence can never be determined until the sequence is concluded; and, since it is this meaning that typically forms the point of departure for the sequence which follows, no single participant—except when constructing an extended monologue—can ever predict or control how an episode of discourse will develop beyond the current
move. Thus, dialogic discourse—even when one participant has unequal topic control—is co-constructed sequence by sequence; it both depends on, and further develops, the intersubjective agreement between the participants about the interactional goal to which they are orienting.

Nevertheless, the very fact that sequences are for the most part smoothly negotiated to a conclusion provides strong evidence for the existence of generic structures at this level, to which participants orient in making their successive moves. The one that has received the most attention in educational research to date is the teacher-directed three-part structure that Lemke (1990) refers to as 'triadic dialogue.' As its name implies, this structure consists of three obligatory moves, Initiation, Response and Follow-up, which must occur in this order. However, this is by no means the only generic structure to occur in classroom interaction, particularly if task-oriented talk between students is also taken into account (Forman & McPhail, 1993; Phillips, 1988). And as I have shown elsewhere (Wells, 1993a) and will further argue below, even this basic I-R-F structure can be used by a teacher to achieve quite different goals.

In the present context, however, what needs to be emphasized is that the generic organization of these different sequence-types is readily recognized by members of a discourse community in which they frequently occur. And so, by orienting to the sequence-type's organizational structure, participants are able to determine what sorts of moves are permitted or required at each stage and so to contribute appropriately to the meaning that is being jointly constructed. Thus, whether we refer to them as "microgenres," or by some other term, it is clear that, as with the more familiar genres of written discourse, the culturally recognized patterns in terms of which they are organized enable them to function as tools in the jointly organized 'operationalization' of 'action.'

Part 2. Discourse in the Classroom: Exploring the Significance of Follow-Up

In the discussion so far, I have been concerned to show, in general terms, how different modes of discourse can be conceptualized, within an 'activity theory' framework, as a tool-kit that is utilized to perform the 'operations' through which the goals of 'action' are achieved. However, although my purpose is to bring this descriptive apparatus to bear on classroom interaction, I have not as yet explicitly addressed the ways in which discourse is organized to serve a specifically teaching function. This will be my focus in this second part of the paper. But first I must situate my conception of the teacher's role in the context of my understanding of the practice of education.

The Two Levels of Teaching

In the ongoing debate about the goals of education, there are two main contending points of view. The first of these emphasizes the goal of cultural reproduction—the transmission to successive generations of the currently valued resources of the culture so that the young of today will be able to contribute productively and responsibly, in their turn, as members of the work force and of the larger society. In the second, on the other hand, the goal that is emphasized is the development of individual students in such a way that each is enabled to achieve his or her full potential as a human being and to make original, and possibly divergent, contributions to the society of which he or she is a member. Unfortunately, in much discussion of this issue, these two goals are often treated as being theoretically incompatible and, in the practice of schooling, this all too frequently proves to be the case.

From a sociocultural perspective, however, these two goals, far from being in conflict, are seen to be both equally necessary and dialectically interrelated. In this view, individual development is only
possible through increasingly full participation in ongoing communities of practice (Lave & Wenger, 1991) and this, in turn, involves the appropriation of the cultural resources by means of which those practices are mediated (Rogoff, 1990). However, appropriation is not a matter of simple internalized reproduction. On the contrary, it is essentially transformative in its effects (Engestrom, 1991). As newcomers engage in joint activities with other members of the culture, they are transformed in terms of their understanding and mastery of the community’s practices and in their ability to participate in them; and this, in turn, transforms the community into which they are being inducted. Furthermore, as newcomers become progressively more able to engage in solving the problems that the community faces, they may contribute to a transformation of the practices and artifacts that are employed, and this, in turn, transforms the community’s relationship with the larger social and material environment.

Within such a transformational framework, my conceptualization of the teacher’s role is based on two assumptions: that schooling should provide an apprenticeship into the semiotic practices—the ways of making meaning—that are valued in the culture; and that teaching-and-learning involves an essentially dialogic relationship (Wells, 1994). However, this is not a dialogue between equals. Both by virtue of his or her status as an employed representative of the community, and as a result of personal experience and education, the teacher must play a different role from that of the students in the classroom community (Rogoff, 1994). As leader and guide, it is the teacher’s responsibility to ensure that the student members engage with the mandated curriculum and that they are assisted to appropriate it as effectively as possible, both as a personal resource for their own current and future purposes, and so that they may be productive members of the society in which they are growing up. How this dual responsibility is realized in practice can be conceptualized as involving two levels of activity, the “macro” and the “micro” (Wells, 1995).

At the macro level, the teacher is the chief initiator and is responsible, among other things, for selecting the themes for curricular units and the activities through which they are to be addressed. These decisions should be based both on knowledge of the students’ interests and current levels of participation and on expectations concerning the semiotic resources that such themes and activities are likely to call into play. In this initiating role, the teacher is also responsible for leading whole class meetings, in which theme and activities are introduced, students presented with appropriately pitched challenges, expectations made clear and, in due course, both processes and outcomes evaluated and reflected upon.

At the micro level, by contrast, teaching can be characterized much more in terms of response. Having created the setting and provided the challenge, the teacher observes how students take it up, both individually and collectively, and acts to assist them in whatever way seems most appropriate to enable them to achieve the goals that have been negotiated. It is thus at the micro level of teaching, when working with individuals or small groups of students, that the teacher is best able to practice the sort of teaching that Vygotsky (1978) characterized as “working in the student’s zone of proximal development.”

These are the requirements, I would suggest, that all teachers have to meet. However, in deciding on the manner in which they meet them, they have a considerable amount of discretion. For, although the teacher must act as leader, leadership does not have to be exercised in a directive manner; and although the teacher is ultimately responsible for the goals to which ‘action’ is directed, and for monitoring the outcomes in terms of students’ increasing mastery of valued cultural tools and practices, it is still possible for students to have a significant part in negotiating both these processes. Here, then, is the teacher’s opportunity for professional growth and creativity—in constantly trying to
find more effective ways of fulfilling her or his responsibilities both to the wider society and to the
diversity of individual students who constitute the community of the classroom.

A major part of this responsibility is to engage the students in a semiotic apprenticeship into the
‘actions’ and discourse genres that constitute the ways of making meaning in the different disciplines
(Wells, 1994). In fact, it is this intended outcome that should guide the choice of activities within
curricular units, as it is only when students engage in activities in which these ‘actions’ and genres
constitute the appropriate tools for mediating the achievement of the activity goals, that they will have
the opportunity to master them through genuine participation. Ensuring that such opportunities occur
clearly constitutes a central component of what I earlier called the macro level of teaching.

At the micro level, it is in the moment-by-moment co-construction of meaning, in the sequences
and episodes of discourse through which these activities are realized, that the craft of teaching is found.
In particular, I would suggest, it is through the strategic use that the teacher makes of opportunities to
follow up on students’ contributions that he or she most effectively facilitates their entry into the
relevant discourse communities. And so it is to a consideration of this aspect of teacher-student
discourse that I now wish to turn in order to illustrate the application of the framework presented in
the first part of this paper.

The Follow-Up: Teaching as Responsive Intervention

Some years ago, when I was trying to develop the thesis that children’s increasing mastery of their
first language occurs as a result of their participation in conversations about the events that constitute
their everyday experience, I became interested in the conversational strategies that parents employ to
extend the conversational topic beyond one single-exchange sequence (Wells, 1981). One group of
strategies, in particular, caught my attention. Simply put, these strategies involve making the response
move in the first exchange act as a pivot for two linked exchanges.

Typically, in the early stages, it is the child’s initiating move which is responded to in such a way
that it calls for a further response. In the following sequence, recorded when Mark was 23 months old,
his mother uses three variants of this strategy. In (2), she implicitly acknowledges Mark’s topic-
initiating informing move by asking a dependent question; in (4), she offers an alternative interpretation
of what the birds are doing and invites Mark to confirm it; and in (6), she extends the agreed upon
proposition about the birds eating the berries.5

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<tr>
<th>TALK</th>
<th>EXCH MOVE PROSP FUNC</th>
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<tbody>
<tr>
<td>1 Mark:</td>
<td>Nuc. I G Inform</td>
</tr>
<tr>
<td>2 Mother:</td>
<td>Nuc. R (A)</td>
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<tr>
<td></td>
<td>Dep. I D Req. Inform</td>
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<tr>
<td>3 Mark:</td>
<td>Dep. R G Inform</td>
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<tr>
<td>4 Mother:</td>
<td>Dep. I G+ Reformulate + Req Confir</td>
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<td></td>
<td>Dep. R G Confir</td>
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<tr>
<td>5 Mark:</td>
<td>Dep. I G Extend</td>
</tr>
<tr>
<td>6 Mother:</td>
<td>Dep. R A Acknowledge</td>
</tr>
<tr>
<td>7 Mark:</td>
<td></td>
</tr>
</tbody>
</table>

(Wells, 1981, p.102)
What I soon realized, however, was that these strategies for sustaining the conversation can equally well be seen as a form of teaching, in which the adult encourages the child to add more information and clarifies and extends his attempts. And, because it is the child who has initiated the topic, the adult can be reasonably certain that there is intersubjective agreement about the current focus of attention and that, as a result, the new information will be (at least partially) understood.

In the classroom, where there are 30 children for the teacher to interact with, it is impossible to adopt the same strategies—at least when interacting with all of them simultaneously. In this context, an alternative is for the teacher to initiate the sequence with a move that simultaneously specifies the topic and invites one of the students to contribute further information; then, following the student response, the teacher can add a further move to confirm, clarify or extend the proposition that has been co-constructed in the nuclear exchange. Sequence 3 in the first episode quoted below (see p.91, lines 48-59) is a very clear example of this strategy. In response to the teacher’s request, Salina offers a relevant suggestion and the teacher extends that suggestion by proposing practical ways in which it could be put into effect.

As can be seen, from a functional and pedagogic perspective, there is considerable similarity between this sequence and the one in which Mark and his mother talked about the birds. Although they differ in who initiates the topic that forms the point of departure for the adult question, in both cases the child’s response is further responded to in the following adult move(s). Yet, despite this similarity, the two sequence types would, in most work on classroom discourse, be analyzed very differently. The former—if it was discussed at all—would be treated as a succession of topically related exchanges, whereas the latter would be treated as a single instance of a triadic dialogue exchange, with the structure: Initiate - Response - Follow-up. There is, however, an alternative analysis, which allows the two sequence types to be treated as variants of a single more generic discourse structure.

It is a very general principle of conversation that, within an exchange, moves decrease in ‘prospectiveness’ (Wells, 1981). The most strongly prospective move is a Demand, which requires a Give in response. A Give is less prospective: it expects but does not require a response. Least prospective is an Acknowledge, which always occurs in response to a more prospective move but itself expects no further response. The scale is thus ordered D>G>A and there are two basic exchange types, depending on whether the initiating move is Demand or Give:

(i) D-G-A
   D: Did you hear the forecast for today?
   G: They said there’d be snow later
   A: Ugh!

(ii) G-A
   G: The forecast says there’ll be snow today
   A: Oh

Conversation that was made up only of such sequences, each consisting of a single nuclear exchange, would perhaps be efficient, but it would not be very interesting. Nor would it provide a very rich opportunity for learning about the ways in which community members conceive of objects and events being related to each other—i.e., the community’s “theory of experience” (Halliday, 1993). In practice, however, such minimal sequences are the exception rather than the rule. For there is a second principle to the effect that, at any point after the initiating move in an exchange, a participant can, while still

*Using the Tool-Kit of Discourse*

Gordon Wells
minimally or implicitly fulfilling the expectations of the preceding move, step up the prospectiveness of the current move so that it, in turn, requires or expects a response. In effect, what this does is to initiate a further, dependent exchange, in which some aspect of the preceding exchange is extended or qualified in some way.

Adopting this analysis, we can now see the similarity between the two examples considered above. In both cases, the adult uses this “follow-up” strategy to involve the child(ren) in an extension of the ‘content’ that has been co-constructed up to that point. In the first example, this strategy is used three times. In (2), the mother makes a D move where only A is expected, thereby requiring Mark to extend his own initial observation. In (4), she makes a G move in place of the expected A and offers a more accurate formulation of the birds’ activity; she also adds a tag, which has the effect of making her move more strongly prospective (G+), thus requiring Mark to confirm her formulation. And in (6), she once more substitutes a G for the barely expected A in order to add information which relates the observed event to a cultural pattern more familiar to the child. And, since her G move expects an A in response, Mark duly obliges with a minimal “Oh,” which brings the sequence to a close.

In the second example (p. 91), the strategy is used only once. The expected structure of the nuclear exchange is I-R-F, with the teacher contributing a D in the first move and an A in the third. However, in the second part of the third move, the teacher steps up the prospectiveness by making a G move (lines 54–58), in which she extends the student’s response by adding a further, related suggestion of her own. In this case, however, the dependent exchange that she initiates does not close with an overt A move from the student(s)—and it rarely does in triadic dialogue—as she herself concludes the sequence with a repetition of her earlier evaluation and, without pausing, goes on to initiate a new sequence, and the episode continues in similar format, with the students contributing suggestions and the teacher extending them.

The point of introducing this comparative analysis of the two examples, then, has been to show how, in very different contexts, the use of the same basic strategy of exploiting the possibility for follow-up within a sequence in progress allows a more knowledgeable participant to contribute to the learning of the less knowledgeable in ways which nevertheless incorporate and build on the latter’s contributions. This is one important form that responsive teaching can take at what I earlier described as the micro level of teaching. However, as we shall see below, there are significantly different ways in which the follow-up move can be used to perform this teaching function.

In their pioneering scheme of analysis for classroom discourse, Sinclair and Coulthard (1975) propose three categories of ‘act’ that can occur in the follow-up move of a triadic dialogue exchange: “accept” (including reject), “evaluate” and “comment.” This latter category includes the more delicate sub-categories of “exemplify,” “expand” and “justify,” each of which, according to the reanalysis proposed here, is realized through the initiation of a dependent exchange, by the teacher making a D or G move where only an A is expected. Put in different terms, by exploiting the scale of prospectiveness, a dependent exchange can be added on to the nuclear exchange and one of the various sub-categories of comment used to relate the current sequence to the personal experience of one or more of the participants or to some more systematic knowledge structure which has been built up within the classroom community or is imported from the relevant discipline.

In the North American tradition (e.g., Mehan, 1979), by contrast, “evaluate” is the term used to designate the third move of every triadic dialogue exchange (I-R-E), and not just one of its functions—no doubt because this is the function that the third move is most frequently observed to perform. However, this functional category, too, consists of more delicate sub-categories; in addition to
“accept” and “reject,” the teacher may “reformulate” (by restating a student’s response in a clearer or more accurate form) or “correct” (by providing an alternative response that is to be heard as more appropriate than the one supplied by the student).

Newman, Griffin, and Cole (1989) describe these follow-up interventions in terms of “gatekeeping”:

Rather than seeing it primarily as an evaluation of the child speaker, [Griffin and Humphrey] demonstrated that the third part of the sequence acts as a gatekeeper for the content of the lesson. Unless a teacher goes into a lecture format, this gate-keeping turn is about the only thing that a teacher can use to make sure that the proper information is available for learning and that improper content is removed from consideration by the lesson participants. In essence, the three parts can be seen as one assertion that is collaboratively constructed by the teacher and the children. (p. 125)

A very similar argument is made by Edwards and Mercer (1987) for the use of moves with these functions in the interest of jointly constructing what they call “common knowledge.”

One feature shared by all the functions of follow-up moves so far discussed is that it is the teacher who, in the dependent exchange, does the work of supplying the “proper information” or of making connections to other bodies of knowledge—albeit in a responsive manner that takes account of the student’s contribution. However, there is another group of follow-up interventions that offers this role to the student. These typically occur in dependent exchanges initiated by a move in which a student is requested to perform the very same functions as are performed by the teacher in the third move of triadic dialogue. Thus, the request may be to “clarify,” “exemplify,” “expand” or “explain,” or it may take the form of a challenge to the speaker to “justify” a proposal (or a proposition presupposed by that proposal). Instances of some of these functions can be seen in Episode 2 (pp. 91-92 below). The final outcome of such a sequence—an increment in the group’s common knowledge—is often similar to that arrived at by means of teacher-dominated triadic dialogue, but the distribution of responsibility for achieving it is very different. For here it is the student, rather than the teacher, who does most of the work involved in producing the acceptable formulation.

In focusing on the various ways in which a teacher can initiate a dependent exchange to follow up on a student move, I have, in effect, been developing an account of an important set of discourse ‘operations’ that she or he may use, both strategically and responsively, to mediate the ‘action’ of teaching at what I earlier called the micro level. In order to understand better when and why the different alternatives are selected, however, we need to return to the ‘activity system’ as a whole and, in particular, to a consideration of the nature of the goals which direct the participants’ ‘actions.’

Determining the Goals of Classroom Activities

Let me start by attempting to bring together the various strands of the foregoing discussion in a synoptic representation of the overall descriptive framework that is being proposed. This is set out in Table 1 (next page). The two dimensions of the table correspond to two different ways of conceiving of “enactment.” On the horizontal dimension, the relationship is that of realization, as proposed in Leont’ev’s tri-stratal theory of ‘activity.’ On the vertical dimension, by contrast, the relationship is that of constituency: units at higher levels consist of one or more units at the level next below. Inevitably, this representation is extremely schematic and non-specific, as it is intended, in principle, to account for the full range of variability that occurs across classroom events as a result of differences in: age of the students, curricular area being addressed, resources available, as well as the teacher’s

Using the Tool-Kit of Discourse

Gordon Wells
"philosophy of education." Furthermore, it makes no attempt to represent the dynamic dimension of "enactment," as events are co-constructed over time. Despite these limitations, however, it does provide a useful summary of the main categories previously discussed and of the relationships between them.

The next step towards filling out the framework is to incorporate the model of an 'activity system' proposed by Engeström (1990), which was presented in Figure 1 (p. 77) above. However, since an expanded triangle of mediated action applies at every level in the hierarchy of 'action,' I will not attempt to represent the resulting framework here. Nevertheless, that model does supplement Table 1 in a number of important ways, notably by introducing the influence of the contextual categories of 'rules,' 'community' and 'division of labor' into the relationships of realization, and by making clear

Table 1. The Enactment of the Practice of Education

<table>
<thead>
<tr>
<th>'ACTIVITY'</th>
<th>'ACTION'</th>
<th>'OPERATION'</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Motive)</td>
<td>(Goal)</td>
<td></td>
</tr>
<tr>
<td>Practice of Education</td>
<td>Curricular Unit</td>
<td>Increasing mastery of:</td>
</tr>
<tr>
<td></td>
<td>(a) cultural reproduction</td>
<td>(a) content knowledge</td>
</tr>
<tr>
<td></td>
<td>(b) development of</td>
<td>(b) discipline-based practices</td>
</tr>
<tr>
<td></td>
<td>individual potential</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c) fostering of</td>
<td>(c) tools &amp; artifacts</td>
</tr>
<tr>
<td></td>
<td>communities of</td>
<td>(d) metacognition</td>
</tr>
<tr>
<td></td>
<td>inquiry</td>
<td>(e) collaboration</td>
</tr>
<tr>
<td>Curricular Activity</td>
<td>Outcomes related to (a)-(e)</td>
<td>Use of semiotic tools, including</td>
</tr>
<tr>
<td></td>
<td>above</td>
<td>spoken discourse, e.g., Curriculum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>genres (cf Christie, 1993)</td>
</tr>
<tr>
<td>Task</td>
<td>Completion of a</td>
<td>E.g., Co-construction of</td>
</tr>
<tr>
<td></td>
<td>component of an</td>
<td>episode of discourse</td>
</tr>
<tr>
<td></td>
<td>activity outcome</td>
<td></td>
</tr>
<tr>
<td>Step</td>
<td>Contribution to</td>
<td>E.g., Co-construction of</td>
</tr>
<tr>
<td></td>
<td>outcome of task</td>
<td>sequence of discourse, using a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>micro-genre, e.g., triadic</td>
</tr>
</tbody>
</table>

Mind, Culture, and Activity
Volume 3, No. 2 1996
that there are different perspectives on the enactment of the ‘activity system’ depending on who is in
the ‘subject’ position. This is nowhere more apparent than with respect to the goals and mediating
artifacts that are associated with the different levels of ‘action’.6

As I have pointed out elsewhere (Wells, in press), there is no guarantee that, even in a classroom
organized to foster collaboration, there will be agreement about the goals that are being pursued at any
time. There are two major reasons for this. First, the goal may not have been made (sufficiently)
explicit, and participants’ individual construals of the situation may result in a diversity of interpre-
tations. This is particularly likely to take the form of a mismatch between the teacher’s goals and those
constructed by the students when, for example, the class is dispersed to carry out practical work in
groups or individually. The second major cause of goal mismatch arises from conflicting agendas.
Such conflict may well occur when the teacher’s goals do not engage the students’ commitment to the
task in hand; however, it can also occur within a student group that is fully engaged in the task, but
where individual members have different ideas about how the task might best be carried out. Any of
these forms of goal mismatch inevitably impact on the smooth running of the ‘operations’ through
which the ‘action’ is realized and can frequently be detected in the discourse, as goals are renegotiated
or participants draw attention to the mismatch.

However, there is another way in which Table 1 oversimplifies the status of goal in relation to
‘action,’ for it seems to suggest that, at every level, the goal is both determined in advance and constant
throughout the ‘operationalization’ of the ‘action.’ As Lemke (personal communication, Oct. 29,
1993) has pointed out, however, the notion of a stable goal is incompatible with the reality of the move-
by-move co-construction of discourse, in which each move is strategically made in the light of what
has preceded. The goal which is at the current focus of attention cannot, therefore, be pre-scripted in
advance of the moment of utterance. In fact, the same is true of any form of joint activity, if the
participants are responsive to each other’s contributions and to the constantly changing situation which
results from these contributions. Thus, whether the goal is operationalized through discourse or
through some other form of semiotic mediation, new possibilities are constantly being opened up at
each step in the action and, in responding to these, the participants necessarily modify the goal to which
they are orienting to a greater or lesser degree. Lemke, in fact, suggests that the goal can only be
determined in retrospect, once it has been achieved. And Leont’ev also points to the emergent nature
of goals when he observes:

... selection and conscious perception of goals are by no means automatic or instantaneous acts. Rather,
they are a relatively long process of testing goals through action and, so to speak, fleshing them out.
As Hegel correctly noted, an individual “cannot define the goal of his action until he has acted.” (1981,
p. 62, emphases in original).

Nevertheless, while recognizing the force of this argument, I do not think it should lead us to
abandon the concept of ‘goal.’ Instead, we should recognize that the goals to which participants are
orienting are always to some extent emergent, and that this tendency increases the lower one goes down
the scale of ‘action.’ In fact, just as there is a hierarchy of ‘action,’ so too there is a hierarchy of
associated goals, with those at lower levels being increasingly sensitive to the specifics of the
unfolding situation. Particularly in classrooms where the students work for much of the time in groups
and in which they are encouraged to share in the planning and execution of the tasks that they
undertake, therefore, we should expect to find that, at the level of task and step, goals are emergent and
negotiated. On the other hand, this does not preclude the appropriateness of relatively stable goals at
the higher levels of curricular activity and of the curricular unit as a whole, that is to say, goals which

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*Using the Tool-Kit of Discourse*

Gordon Wells
are selected by the teacher, perhaps after some degree of negotiation with the students, and then announced in the expectation that they will serve as a basis for the formulation, evaluation and modification of lower level goals as the action progresses. Indeed, without some organizing goal structure of this kind, to which all participants orient in general terms, it is difficult to see how the 30 or so members of the classroom community could work together productively within the constraints of limited space, time and resources.

However, when the emergent nature of lower level goals is taken into account, it is easy to understand why participants may sometimes have different ideas about the current goal—leading to uncoordinated, or even conflictual, ‘operations.’ It also explains the difficulties that are frequently experienced by analysts as they attempt to segment the transcribed stream of discourse into episodes and sequences. For, when goals are progressively negotiated as events unfold, boundaries are not clear-cut, and the transition to a new ‘action’ unit may only be recognized, by participants as well as by analysts, as having occurred some moments after it was initiated by those who were most responsible for bringing it about.

Finally, in attempting to explain the overall orderliness that characterizes life in most classrooms, we should not ignore the coherence that is given to joint activity by the participants’ orientation to a variety of other features of their shared situation—the objects that are being acted upon and the relations among persons and objects that are familiar from previous occasions. As various writers have pointed out, while the co-construction of meaning is always newly enacted, its achievement is dependent on the cultural continuity provided by the social-material environment.

A Comparison of Two Episodes of Classroom Discourse

At this point I should like to introduce two episodes of discourse from science activities in elementary classrooms. The first occurred in a Grade 4/5 class, at the beginning of an early lesson in a unit on weather. The teacher is conducting a discussion with the whole class and starts by referring to written questions on the topic that the students have already generated.

Episode 1

Sequence 1

26 T: Here are all your ideas about how we can learn about weather, the different things that we can do ..
27 What I’m wondering about is how should we go about this, like if we’re having a weather time to work on weather, what should we be doing during that time?
28 How should we go about learning using all these different things? [Several hands go up, including Jenny’s]
29 T: Jenny?
30 J: We should make a few groups and then one group does weather from books using those little fact sheets and then say the other group gets it from um a movie or from film—from like film slides
or from all different places, from experimenting, so there's several groups doing things and then we trade.

T: OK

41 T: Another idea?
[Several hands up, including Lyndsey's]

42 T: Lyndsey?

43 L: Maybe you could have games ** (inaudible)

44 T: OK

45 Maybe some people would like to make up some games about the weather that would allow you to learn.

46 Uhhuh.

47 T: Another idea?

48 S: We can like look in newspapers and stuff ** -

49 T: Other ideas about how we can go about this?

50 S: We can like look in newspapers and stuff ** -

51 T: Great

52 So I'd like you to start looking in the newspaper and when you find articles about weather you could cut them out and bring them in...

53 T: Ask first to make sure that whoever at home reads the paper is finished with it.

54 T: But that's a great idea, Salina.

After several more sequences of this kind, they move on to a consideration of possible participant structures, and there is some debate about whether it would be good or bad to work in friendship groups. The whole discussion, which lasted for some 20 minutes, continued in this mode throughout.

The second episode occurred in a Grade 6 class, as a visiting teacher (T) joined three students, Nir, Vi-Hung and Ian, who were formulating questions for the next stage of their inquiry into the metamorphosis of some painted lady caterpillars. In the first sequence, they propose a candidate question: "What happens inside the chrysalis?" This leads quite naturally to the second, which this time they treat as a 'real' question and immediately begin to search for an answer.

Episode 2

Sequence 2

74 I: How do they eat?

75 N: Well they can go out through their *
76 T: Well, when you say "how do they eat" you're making an assumption that they DO eat
77 I: I know they eat when they're not in the chrysalis
78 T: HOW do you know?
79 I: ** food
80 T: What did you see that makes you think they eat when they're in the chrysalis?
81 I: **
82 T: Pardon?
83 I: **
84 T: Sorry, I didn't hear. say it again
85 I: Do they eat?
86 T: Do they?
87 I: Yeah,
88 T: like is there food for them in the chrysalis?
89 I: can think about this: does the chrysalis go to its- the chrysalis make contact with food outside itself?
90 T: What did you see that makes you think they eat when they're in the chrysalis?
91 I: No
92 T: Okay
93 I: So if the chrysalis feeds inside the chrysalis, what would the food be?
94 T: Where does it come from?
95 I: **
96 N: I think that they like ate, they ate a lot to get energy to change inside the chrysalis ..
97 T: so I think they were eating the- like * for seven days and they almost ate the food you see there's almost none left..
98 T: Uh-huh
99 N: and- and now it's got like a lot of energy to change and it's changing inside ..
100 T: That's what I think
101 I: So you're- you think it doesn't need food during THIS stage because it's already stored a lot?
102 N: Yeah
103 T: Yeah
104 I: What do YOU think?
105 N: What do I think?
106 T: I think I agree with you
107 I: I think I agree with you too
Several more sequences of a similar kind follow, culminating in a sequence in which the appropriateness of a proposal by Nir is discussed: he suggests that the best way to answer the question about what is happening inside the cocoons would be to dissect one every other day until the butterflies begin to emerge. At this point, the teacher calls the students back into the classroom and the episode comes to an end. However, there the suggestion is taken up by the whole class and, after a lengthy discussion in which everyone participates, it is finally decided that Nir should be allowed to carry out a dissection of a cocoon that seems to have died and, the next day, with help from some of his peers, Nir goes ahead with the autopsy (Wells, 1993b).

In what follows, I shall attempt to relate these two episodes of discourse to the ‘activity systems’ in which they occurred. By so doing, I hope to be able to provide a plausible, although tentative and incomplete, explanation of the differences between them with respect to the discourse microgenres that were deployed. For purposes of comparison, I present the most relevant information in tabular form (see Table 2).

Table 2. Discourse Episodes in Activity Systems in Two Classrooms

<table>
<thead>
<tr>
<th></th>
<th>Example 1</th>
<th>Example 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curricular Unit</td>
<td>Understanding the Weather</td>
<td>Life Cycle of Butterfly</td>
</tr>
<tr>
<td>Topic:</td>
<td>(a) Content knowledge</td>
<td>(a) Practices of inquiry</td>
</tr>
<tr>
<td>Teacher’s Dominant Goals:</td>
<td>(b) Practices if inquiry</td>
<td>(b) Collaboration</td>
</tr>
<tr>
<td></td>
<td>(c) Collaboration</td>
<td>(c) Self-evaluation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(d) Content knowledge</td>
</tr>
<tr>
<td>Activity</td>
<td>Early: before starting inquiry</td>
<td>Late: after observing caterpillars</td>
</tr>
<tr>
<td>Stage in C. U.:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher’s Goal:</td>
<td>Plan organization of C. U.</td>
<td>Continue self-selected inquiries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chrysalis</td>
</tr>
<tr>
<td>Object:</td>
<td>Not yet decided</td>
<td>Magnifying glass, etc.; reference books; spoken discourse</td>
</tr>
<tr>
<td>Mediating tools:</td>
<td>Spoken discourse, lists of individually generated questions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preceding Task:</td>
<td>None</td>
<td>T's directions to generate questions</td>
</tr>
<tr>
<td>Teacher’s Goals:</td>
<td>Generate suggestions for planning curriculum unit</td>
<td>Students generate questions for study of chrysalis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Generate questions for group’s further inquiry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spoken discourse</td>
</tr>
<tr>
<td>Participants’ Goal:</td>
<td>Generate suggestions for planning curriculum unit</td>
<td>3 students with visiting teacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shared control of topic and turns</td>
</tr>
<tr>
<td>Mediating Tools:</td>
<td>Spoken discourse</td>
<td></td>
</tr>
<tr>
<td>Community:</td>
<td>Teacher with whole class</td>
<td></td>
</tr>
<tr>
<td>Division of Labor:</td>
<td>T. controls topic and turns</td>
<td></td>
</tr>
</tbody>
</table>
Despite the one to two years gap in age between the two groups of students and the difference in the topics under investigation, there are considerable similarities between these two classrooms, as compared, say, with the science classrooms reported in Edwards and Mercer’s (1987) study. For in both these classrooms a dominant goal on the part of the teacher is for the students to master practices of inquiry and, to this end, they are encouraged to contribute to the formulation of the goals and procedures that will guide their activities. Nevertheless, although student suggestions are taken into account, it is the teacher who ultimately controls the timing of curricular activities and sets and announces the goals for each lesson period. Student initiative in goal-setting and in choice of means to be used (e.g., the balance between obtaining observational as opposed to library-based evidence) is thus largely exercised within a common superordinate goal structure, which remains relatively stable, at least for the duration of individual lessons.

If the ‘activity system’ as a whole is broadly similar in the two classrooms, what might account for the difference in the very different microgenres deployed in the sequences contained in the two episodes? Here, it seems to me, there are a number of factors, none of which is uniquely responsible, but which, taken in conjunction, provide a plausible explanation. First, there is the task itself and its timing in relation to previous activities undertaken. In the grade 6 class, the study of the developmental cycle of the painted lady caterpillars occurred towards the end of a year in which the students had gained considerable experience in conducting inquiries into topics of their own choosing within an overall theme. Furthermore, they had already spent a considerable amount of time formulating questions and collecting observational evidence concerning development at the earlier, caterpillar stage. They therefore had relevant knowledge and experience to draw on in carrying out the task set by the teacher, the goal of which was to formulate further questions for their group’s investigation of the current chrysalis stage of development. By contrast, the students in the grade 4/5 class had had little previous experience of inquiry learning, except through library-based research. Additionally, the activity in question occurred early in the curricular unit and was concerned with developing an overall plan for the unit; furthermore, the task of generating suggestions concerning relevant parameters itself occurred at the beginning of the planning activity.

A second group of factors of considerable importance was the size and constitution of the ‘community’ immediately involved in each event and the ‘division of labor’ among the members. In the grade 4/5 activity, all the students in the class were gathered in a circle on the carpet, with the teacher as leader and animator. Her goal, which she announced to the group, was to elicit suggestions, on the basis of which they would collectively develop a plan to which all students would then be expected to orient in the subsequent lesson periods devoted to the unit. There was thus a clear outcome in view for the teacher which, although unknown in its specific details, involved the class working towards consensus both about what was to be done and about the reasons for the decisions to be made. The main goals of the discussion task, from her perspective, therefore, were to elicit specific suggestions that could contribute to this outcome, and to establish a forum of collaborative discussion appropriate for the joint inquiry about weather by actually engaging with them in its ‘operationalization.’ In terms of the task goals, then, and of the division of labor, while the goal of engaging in collaborative exploratory discussion was set and maintained by the teacher, the actual outcomes were recognized to be emergent, depending on the specific suggestions made by the students.

In the grade 6 episode, on the other hand, the class teacher had already set the goal for the task, and the group of three boys was engaged in working towards it when they were joined by the visiting teacher. Both as visitor to the class and as temporary member of this small community, the teacher did not have the same authority as the class teacher would have had, if she had been present; he also had
no preconceived outcome in mind in joining the group. There was thus no status-based division of
labor, although, as a teacher, the visitor was prepared to intervene if he thought he could assist the group
in achieving their goal(s).

With these differences in mind, we can now turn to some of the features of the microgenres that
were deployed, with a view to explaining the types of follow-up that occurred and their role in the
development of the episode/task. As already pointed out, the episodes differed with respect to the
parameter of "topic control." In the weather unit planning episode, for reasons discussed above, the
teacher chose to engage the students in "unequal dialogue," in which she controlled both the topic and
the turn-taking. Her selection, at sequence level, of the triadic dialogue microgenre thus set up the
expectation that the teacher, who initiated each sequence, would also make a contribution in the third,
follow-up move. However, since she wished the discourse to be "exploratory" at this stage, it was
important not to use the "evaluative" option. She therefore exploited the follow-up move in ways that
extended the student suggestions in order to make clear that all suggestions would be given positive
consideration, but at the same time to indicate her own evaluation of what was suggested.

In the caterpillar episode, by contrast, it was natural that, among this small group of students, topic
control should be relatively equally distributed and, when the visiting teacher joined them, he tried to
participate in a manner that would maintain this mode of equal dialogue. This is seen in the fact that,
in both this and the preceding sequence, it was a student who was the initiator and another student who
was the first to respond. With respect to "topic focus," although the overall mode was exploratory, once
a candidate question had been accepted, the microgenre selected—for which we have, as yet, no label—
was a form of collaborative debate in which an attempt was made to construct a warrantable answer
that all would accept, at least as a working hypothesis. It was in this context that the visitor intervened
to clarify the argument so far and to challenge his co-participants to justify their proposals. And in so
doing, he clearly acted as a teacher, attempting to assist his fellow participants to use the microgenre
effectively to construct an answer to their question and, at the same time, providing an opportunity for
them to recognize and appropriate this discourse tool.

There is, however, a further difference between the two episodes that may well be of significance
for the types of follow-up that occurred. As has already been noted, the sequences in each episode
involved proposals for consideration that were contributed by one or more of the students. However,
although the proposals in each case shared the feature of tentativeness, they concerned different
perspectives on reality. In the weather unit, the proposals were suggestions concerning future activity
on the part of the community; in terms of the ancillary-constitutive parameter discussed above (p. 80),
they were thus action-oriented, falling into the category of 'planning action.' By contrast, in the
caterpillar unit, under consideration were proposals about the way the world is, put forward in the form
of questions; although answering the questions might subsequently involve action on the part of group
members, the actual consideration of the questions themselves constituted a mode of discourse that
could be categorized as incipient "theorizing."

Do these two modes of construing experience through discourse, that Halliday (1993) dubs
dynamic and synoptic, tend to elicit different types of follow-up? Certainly, one of the most important
lessons that students must learn in studying science is that theories about the material world need to
be grounded in evidence from observation, and so the teacher's strategic challenging of the theory-
evidence connections that were implicit in their proposals can be seen as part of a microgenre that is
central to the synoptically-based discourse of science. The suggestions offered for the organization of
the weather unit, on the other hand, belong more naturally to the domain of interpersonal negotiation
of action, where differences in personal preference are to be expected; here, it is more appropriate to
listen to each suggestion and explore its possibilities rather than immediately challenge its feasibility. These different stances towards experience suggest another possible reason for the teachers' different choice of follow-up moves: A request to justify the grounds for a move just made is much more challenging than an extending or exemplifying comment, and may be more readily accepted in relation to a synoptic proposal in which one is not personally involved than in relation to a dynamic suggestion in which one is. Or perhaps they are equally acceptable in either mode, provided that other conditions are met, such as the addressee not being made to look stupid in front of his or her peers. From this point of view, a challenging follow-up is not as face-threatening in a small group setting as it is when the whole class is involved.

While these explanations must be treated as no more than speculations in the absence of corroboration from the participants involved, what they do make clear is that the choice of the sort of follow-up move to make is a highly strategic one. For it must simultaneously both respond to the ideational and interpersonal dimensions of the sequence in progress and also steer the ongoing episode in the direction required to achieve the goal of the 'action' that the discourse is mediating. At the same time, given the real-time pace of spoken discourse, it is clear that teachers do not have time to consider all the implications of the options available to them at each point at which a follow-up move might be made. Rather, the selection of option is an 'operation' in exactly the sense intended by Leont'ev: it is both below the level of conscious attention and also strategically directed towards the goal of the current 'action' in the conditions that are perceived to prevail.

If this is the case with the follow-up move, it is equally true of any other move that is made in the ongoing co-construction of discourse. Although both purposeful and consequential with respect to the emerging goal of the 'action' they are operationalizing, discourse moves are not independent, consciously chosen acts. Rather, they are produced in the moment, in response to the current state of the 'action-in-progress,' as this is construed by the participants in relation to the 'activity-system' as a whole and to the 'action-types' and discourse genres that have become established as the habitually used tools for pursuing the practice of education in their particular classroom community. In order to understand why a teacher selects one follow-up option rather than another, therefore — or, indeed, one microgenre, task or activity — it is ultimately necessary to understand both the history and sociocultural ecology of the classroom community in its wider context and also the individual teacher's conception of teaching and learning that guides his or her behavior at every level.

Conclusion: Education as Transformation

One way of thinking about the effects, in practice, of different conceptions of learning and teaching is in terms of the 'rules' that figure in Engestrom's model of an 'activity system.' As he points out: "In traditional school learning," these rules include "those that sanction behavior and regulate grading" (1991, p. 249). They also include 'rules' that concern such matters as the degree to which curricular subjects are integrated or kept firmly separated, the relationship between the macro and micro levels of teaching and, more generally, whether the pedagogy is "visible" or "invisible" (Bernstein, 1975).

To adopt the 'rule' perspective on such differences between classrooms seems to carry with it an implication of external constraint. And, indeed, in some schools, teachers do work under quite severe constraints of curricular content, programming, norms of movement and noise level, and so on. However, in most jurisdictions — and certainly in the schools in which we have worked—teachers have considerable discretion in deciding how to enact the practice of education in the day-by-day events that
make up their programs. Although suggestions or recommendations may be made by administrators at various removes from the classroom it is the teacher who, in the last resort, decides whether to have students working collaboratively in groups or to “teach” them from the front of the class; whether to value conjectures, supported by argument, or ‘correct answers,’ as defined by the textbook; whether to attempt to get all students to achieve the same outcomes at the same time, or to recognize the various forms of diversity in the student community and to tailor expectations to take account of these differences, by negotiating appropriate challenges for each individual and providing the assistance that each needs in order to meet them.

An alternative way to think of such differences—which gives greater recognition to the teacher as agentive decision-maker—is to combine the notion of rules with Halliday’s concept of register. Register, it will be recalled, accounts for the reciprocal relationship between situation-type and the choices that are made from the total linguistic meaning potential (see p. 79). As I have argued elsewhere (Wells, 1993a), the value of this concept for thinking about educational change is that it provides a way of understanding how, through semiotic choices made in terms of the ‘actions’ and ‘operations’ that are selected, the teacher can change the larger situation, or, in the terms of activity theory, can instantiate a particular version of the practice of education.

Take, for example, the set of follow-up options that are available to the teacher when responding to a student contribution. Continually to choose the “evaluate” option—whether accepting or rejecting—does much to create a situational context in which right answers will be given priority by students. By contrast, frequently to choose the “extend” option creates a different context—one which emphasizes the collaborative construction of meaning, both in the setting of goals to be aimed for and in the construction of “common knowledge.” And the choice of the options which call upon students to justify, explain and exemplify creates yet another context—one which encourages students critically to examine and evaluate the answers that they make to the questions that interest them and which simultaneously provides an opportunity for their apprenticeship into these “genres of power” (Lernke, 1988).

However, to suggest that teachers deliberately change the type of feedback options they use may, at first sight, appear to involve a contradiction. Earlier I argued that, although strategic, the selection of follow-up move was made below the level of conscious attention. However, while I believe this to be generally the case, it is possible, as Leont’ev (1981) indicates, deliberately to step up an operation to the level of action for a while in order to make it a matter of conscious attention. This is what a teacher, alerted to his or her habitual behavior, might choose to do and, in this way, develop a changed stance, that makes the deployment of the more empowering options his or her ‘preferred’ response at critical points in the unfolding discourse. In fact, investigating one’s practice in order to make such improvements for the benefit of one’s students is a major part of what is involved in being a “thoughtful practitioner” (Atwell, 1991).

In much of the research in the human sciences, the emphasis has been on investigating how ‘activity systems’ determine the ways in which ‘actions’ are ‘operationalized.’ The concept of register, by contrast, invites us to consider the converse relationship—how changing the ‘operations’ by means of which an ‘action’ is carried out can ultimately change the ‘activity system’ in which the ‘action’ is embedded. Of course I am not suggesting that the teacher’s use of the more empowering types of follow-up can alone create an alternative realization of the practice of education. But when these options are deliberately but responsively deployed in the context of congruent choices with respect to options at other levels in the hierarchies of genre and ‘action,’ they can indeed create different ‘activity systems,’ with different ‘rules’ and ‘division of labor.’

Using the Tool-Kit of Discourse
Gordon Wells

97
It is in this way, I believe, that teachers have the power to transform the practice of education. If they choose to, they can make of their classrooms, communities in which members engage collaboratively in actions which they find personally meaningful and socially relevant; in which students are assisted to appropriate the valued resources of the culture, including artifacts and skills that are not purely linguistic; and in which individual creativity and diversity of culture, class, and gender are also recognized and valued (Gallas, 1994; Wells, et al, 1994). But, to make these transformations, as Tharp and Gallimore (1988) so cogently argue, they need assistance in exactly the same way as their students do.

For those responsible for the education of teachers, therefore, there are similar choices to be made. If we wish to see more classroom communities of the kind just described, we must create similar communities of inquiry in which teachers and researchers collaborate in investigating ways of improving practice. Both the teachers whose classrooms have provided the episodes discussed in this paper have been involved in this sort of collaborative inquiry. By selecting which aspects of their practice they wish to problematize, and by critically examining recorded observational data, together with other evidence that their students provide, they are taking charge of their own professional development and using the resources of these different communities to achieve the goals that they consider important (Chang-Wells & Wells, forthcoming). And, because their inquiries, and ours as researchers, intersect with those of their students, overlapping communities of inquiry are formed, in which everyone is able to learn and, at the same time, to assist others to learn.

Notes

The preparation of this paper was supported by a grant from the Spencer Foundation to the Ontario Institute for Studies in Education for a project entitled “Learning through Talk.” However, the views expressed are those of the author and not necessarily those of the Foundation. A somewhat longer version of the paper was presented at AERA, April 1994.

I should like to acknowledge the substantial contributions of my colleagues, Patrick Allen, Myriam Shechter and Barbara Smith, in the development of the framework presented here. I should also like to thank Jackie Alspector and Zoe Donoahue for allowing me to quote from observations made in their classrooms, and my fellow symposiasts, Andrew Cohen, Glenn Humphreys, Eugene Matusov and Jun Oshima, for helping me to map out the territory covered in this paper and for their comments and suggestions in the course of its preparation. Finally, I should like to thank Gen Ling Chang-Wells, Jay Lemke and the anonymous reviewers of an earlier version for helping me to see more clearly what I was trying to say, and the many contributors to XLCHC (now XMCA) for the stimulating discussions on activity and discourse which have influenced the arguments presented here. This paper should be read as part of that ongoing dialogue.

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Before proceeding further, it is necessary to address the issue of terminology. Unfortunately, it is difficult to use the terms 'activity', 'action' and 'operation' without ambiguity as, in addition to the technical meaning they have as categories within Leont'ev's theory, they each have a more general, non-technical meaning in everyday usage. The term “activity,” in particular, has a meaning in educational discourse that is very similar in scope to the term 'action' within the theory. One possibility would be to invent a new term for each of the strata in Leont'ev's model—as I am proposing to do by referring to the "practice of education." However, this would cause a different sort of confusion for those already familiar with these terms, as they are used in discussion of activity theory. The solution I have adopted, therefore, is to signal through the use of single quotes when I am using 'activity', 'action' and 'operation' to refer to the strata within Leont'ev's model. When the terms are used without quotes, on the other
hand, I intend them to be understood as they are used in non-technical discourse about classroom events and about human behavior more generally.

An important qualification must be added to this statement. Any 'act' (to choose a term which is neutral with respect to the theory under discussion) can, on different occasions, be viewed as 'action' or 'operation'. Which stratum it is assigned to depends on the focus of attention. For example, in the case of someone driving a car, the driving may function as an 'operation' if the driver's attention is focused on the 'action' to be carried out on arrival at the destination, or as an 'action' while negotiating a tricky highway intersection. Similarly, from the analyst's perspective, the driving will be treated as an 'operation' when it is the subject's work patterns that are under investigation, and as an 'action' when the focus is on the driver's coordination of multiple sources of information. Put more generally, most 'acts' of any complexity cannot be treated as unequivocally 'actions' or 'operations' independently of the larger frame of reference. Furthermore, any 'action' may simultaneously realize more than one 'activity', and an 'operation' more than one 'action'.

Bakhtin (1986) also uses genre as an analytic category (see also Wertsch, 1991) but, unfortunately, in a way that does not exactly correspond to that in systemic theory. In Bakhtin's writings, genre is used to refer to distinctions of the kind that Halliday treats in terms of register.

Although using somewhat different terminology to refer to the units in terms of which the discourse is analyzed, Pontecorvo et al. (1990) have developed a somewhat similar framework to investigate the forms of reasoning that occur in group discussion.

In this and the subsequent transcribed episodes, the following conventions apply: . = 1 sec. of pause; <> enclose segments where the transcription is in doubt; * = a word that is inaudible; CAPS = spoken with emphasis; underlining = segments spoken simultaneously. In the coding: Nuc. = Nuclear exchange; Dep. = Dependent exchange; Emb. = Embedded exchange; I = Initiating Move; R = Responding move; F = Follow-up move; Req = Request; Ack = Acknowledge.

See, for example, Engestrom's discussion of the different roles in the mediation of action performed by the same tool when seen from the perspective of different subjects in "When is a tool? Multiple meanings of artifacts in human activity" (1990, chapter 8).

"Backchannel" is the term used for a contribution made by listener in the course of a speaker's turn to signal that he or she is following the speaker's drift; such contributions do not constitute "moves," in the sense intended here, as they occur within, rather than after, the move to which they are related (cf. Coulthard, 1977, p.62).

References


Using the Tool-Kit of Discourse

Gordon Wells


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Using the Tool-Kit of Discourse
Gordon Wells 101