CLASS 4.0 USER's MANUAL

A WINDOWS LAPTOP-COMPUTER SYSTEM FOR THE IN-CLASS ANALYSIS OF CLASSROOM DISCOURSE

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Automating the Measurement and Assessment of Classroom Discourse •
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Classroom Discourse Is . . .

- *The language of learning* (Courtney Cazden)
- *The ocean on which all else floats* (James Britton)

Talking to Learn Is . . .

- *A struggle to organize . . . thoughts and feelings, to come up with words that . . . shape an understanding* (James Britton)

Introduction

CLASS 4 is a Windows laptop-computer program for the in-class analysis of classroom discourse. The unit of analysis in this program is the question, and to operate CLASS 4.0, the classroom observer types in and codes each nonprocedural question that teachers and their students ask during the course of a class period. Procedural questions, e.g., questions about pages to be read as homework, are not included in this analysis since they are peripheral to instruction and learning.

Questions, of course, presume answers, and question-answer exchanges dominate classroom interactions in English Language Arts instruction. Hence, for purposes of analysis, the questions teachers and their students ask during a class period effectively index the entire discussion, and we may build profiles of instruction and study classroom discourse by focusing on the questions.

In using CLASS 4, the observer is prompted to code each question for (a) **source** (who asks the question: teacher or student), (b) **response** (whether there was a response), (c) **authenticity** (authentic questions are questions for which the teacher has not prespecified an answer), (d) **uptake** (uptake occurs when a teacher incorporates a previous student answer in a subsequent question), and (e) **cognitive level** (report or high level: generalization/analysis).

Unlike previous versions of CLASS, CLASS 4.0 codes responses to questions for (a) respondent's **identity**, (b) extent of **elaboration**, (c) **audience** for the response (teacher or class), and (d) **relation** of response to other responses.

Because of the importance of student questions (Nystrand, Wu, Gamoran, Zeiser, & Long, D. [2001]), CLASS 4.0 also prompts the observer to code the teacher's response to student questions, checking whether the teacher uses the question to open up discussion or manages it in such a way as to table it.

During seatwork, lecture, reading aloud, small group work, and question-answer activities, CLASS 4.0 prompts the observer

periodically to indicate the number of students who are obviously offtask, plus any appropriate adjustments in the number of students in the class (in case any have recently entered or left the classroom). The program also elicits miscellaneous holistic assessments of instruction and curriculum after each observation.

When data collection is completed, the observer can use the program to proofread, edit, and revise the file for incomplete and inappropriate codings and compute basic statistics for each episode and class.

CLASS 4.0 is premised on a view of instruction not as what teachers provide or do to students but rather as what teachers and students collaboratively negotiate. High-quality classroom discourse is characterized by substantive reciprocity between teachers and their students. In such instruction, students and not just teachers have a lot of input into the business of the classroom and hence what is learned. CLASS 4.0 provides a number of measures designed to assess the quality of interaction between teachers and their students. A fuller discussion of this view of instruction as discourse is presented in Nystrand (1997), Applebee (1996), and Langer (1995).

The linkage of human to human is, in the final analysis, the groundwork of all ethics as a reflection on the legitimacy of the presence of others. H. R. Maturana & F. J. Varela

The bottom line for instruction is that the quality of student learning is closely linked to the quality of classroom talk. Martin Nystrand

§1. Rules for Classifying & Coding Classroom Discourse

§1.1. Discourse Episodes and Segments

An **episode** is a coherent classroom activity centering around a particular purpose or topic. A new episode starts when the teacher addresses a new purpose or topic. High school lessons typically begin and end with procedural episodes "Getting started" and "Preparing to leave." Between these episodes, we typically find one or more instructional episodes, which often consist of two or more activities. For example, in teaching a lesson on *Roll of Thunder, Hear My Cry*, a teacher may begin by reviewing the previous night's reading assignment in a question-and-answer session, which develops into an open discussion or leads to smallgroup work, which culminates in in-class writing as students write their reactions to the exchange of views during discussion; the teacher views this writing as a head start of that night's homework assignment, which is to read the next chapter. CLASS treats sequences of activities like this as a series of **segments** comprising an instructional **episode**. The episodic structure for the lesson just mentioned is:

Episode 1: Getting started
Episode 2: *Roll of Thunder, Hear My Cry*
    Segment 1: Q/A
    Segment 2: Discussion
    Segment 3: Seatwork/monitoring
Episode 3: Preparing to leave

An **activity** is defined by how it develops or is realized. If a teacher's planned review turns into a discussion, it is to be coded as a Q/A segment followed by a discussion segment, even if the teacher planned only a review. Similarly, if students are doing silent reading start writing answers to homework questions

about the reading, it is to be coded as a silent reading segment followed by a seatwork segment. Two rules:

- Activities are defined by how they are enacted.
- If some students are engaged in one activity, e.g., silent reading, and others are doing something else, answering homework questions, code the activity which most of the students are doing.

§1.2. Approach to Question Coding

CLASS question coding treats questions as sites of interaction. As Heritage & Roth (1995) and Schegloff (1984) contend, the character of any unit of discourse and related interaction is a function of the participants' understanding. Following this principle, you are to code not questions per se but rather the participants' understandings of their interactions as manifest by their discourse moves. To judge the authenticity of a question, for example, requires that you take your cues not only from how students answered the questions, but also how the teacher responded to the students' answers. As with authenticity, cognitive level is to be coded according to the level of cognitive functioning the question elicited, not the question by itself. In all cases, code not the questions directly but rather the character of social interaction involving, valorized, and elicited by the questions.

§1.3. Questions Not To Code

§1.3.1. Rhetorical Questions.

Be alert to rhetorical questions. They are not to be rated (not even recorded).

§1.3.2. Procedural Questions.

Questions like "Does that answer your question?" and "Do you have any questions?" are procedural, not substantive and should not be included in your list of coded questions.

§1.3.3. Discourse-Management Questions. Questions like (a) *"What?", "Did we talk about that?",* or *"Where are we [in the text]?"*, which manage classroom discourse, and (b) *"Do you remember our discussion from yesterday?"*, which initiate discourse topics, should not be coded.

§1.4. Aborted and Repaired Questions

A question-and-answer sequence is a negotiation of sorts. In asking a question, a conversant in effect enters (or sustains) a negotiation with conversants, and the question posed must work in terms of the knowledge, experience, and expectations of the other conversants, i.e., it must initiate or sustain a **shared balance of discourse** (Nystrand, 1986). If teachers ask questions that elicit no answer, this is an **aborted question**; click 'N' (No) when prompted for RESPONSE (Y*/N: the asterisk indicates that Y is the default; simply pressing <ENTER>). Note that an aborted question is different from a **repaired question**, which is a question the teacher asks and, without giving students a chance to answer, revises. When someone repairs a question, you need only record the final version of the question.

The proportion of teacher questions that fails to elicit an answer is an index of the extent to which the teacher incorrectly anticipates the capabilities and knowledge of the class. If the teacher asks too many questions that students are unable to answer or don't know how to answer, it means that the teacher has misjudged the students in some fundamental way; the question indexes a mismatch.§2.5. Authentic vs. Test Questions

> *Learning is often built on surprises.* Robert Gundlach

§1.5.1. Authentic Questions are questions whose answers are not prespecified by the teacher. By contrast, an **inauthentic question**, sometimes called a **test question**, allows students no control

over the flow of the discussion, and an authentic question allows the student substantial input, if not control over, the flow of the discussion.

§1.5.2. "What Else?" Code the question *"What else?"* as:

- **Inauthentic** (test) when it is used for negative evaluation, i.e., when a student gives a wrong answer and the teacher continues to look for the correct one by saying, *"What else?";* or
- **Authentic** when used during brainstorming, i.e., when any answer is satisfactory.

§1.6. Uptake

Uptake is the speaker's incorporation of a previous answer into a subsequent question (Collins, 1982). It is often marked by the use of pronouns:

- *How did it work?*
- *What causes this?*
- *What city grew out of this?*

In such questions, the pronoun (technically a **deictic reference**) refers to a previous response.

To qualify as uptake, a question must incorporate a previous answer, *not a previous question.* Normally, this incorporation of a previous answer will involve actual quoting. Questions that are repeated do *not* qualify as uptake.

Less obvious deictics include:

then: e.g., *"And then what happened?"* Here *then* means *"after that,"* i.e., *"after what you just said."*

so: e.g., *"So which value was given to them?"* Here *so* means *"Given that,"* i.e., *"Given what you just said, which value was given to them?"*

maybe: e.g., *"Maybe. What do you think?"* where *maybe* should be read *maybe so.*

though: e.g., *"Per item though?"* where teacher follows up a student response to get a more specific answer (previous question was *"Which has higher overhead?")*: *though* here means *"despite or beyond what you said."*

§1.6.1. Uptake by Ellipsis. Uptake may be characterized by ellipsis. For example, if, when a teacher asks a question and a student answers, the teacher then asks *"Why?",* the *"Why?"* is to be scored positive for uptake; *"Why?"* incorporates the previous student answer by ellipsis. *"Because . . .?"* as a follow up question works the same way.

§1.6.2. Missing Uptake. In the following sequence, there is *no uptake*:

Teacher question:	*What's the first x?*
Student response:	...
Teacher question:	*What's the second x?*

There is no uptake here because the teacher does not incorporate a student's *answer* into a subsequent question.

§1.6.3. Types of Uptake. Uptake will either be faux (test) uptake or authentic uptake.

- Authentic uptake: Teacher asks an unprescripted question about a student response.

- Test (faux) uptake:
  (a) Teacher incorporates previous answer into an ongoing script. E.g.,

  Teacher: *What's the subject of the sentence?*
  Student: *"Rabbit"*
  Teacher: *And the rabbit did what?*

In this exchange, the teacher follows up on the student's answer ("rabbit"), but the answer was entirely predictable.

(b) Teacher follows up a student answer to check (test) the student's understanding

§1.7. Cognitive Level

§1.7.1. Reporting vs. Thinking. We distinguish two levels of cognition:

R* **Recitations and reports**: What happened? Don't correspond to screen prompts (default)
H High-level **generalization or analysis**, i.e., thinking: What happens? and Why?

As a general rule of thumb, lower-order questions (i.e., questions eliciting reports) result in answers that are known information whereas higher-order questions (i.e., questions eliciting generalizations, analyses, or speculations) result in answers that are new information.

Like authenticity, the cognitive level of questions cannot be judged altogether from words alone. In judging cognitive level, code the level of cognitive functioning that the question seeks to elicit, not the question by itself or its linguistic structure. Cognitive functioning is high to the extent that "the question cannot be answered through the routine application of prior knowledge" (Newmann, 1988). In Polanyi's (1962) terms, low-level cognitive functioning is a routine performance whereas high-level cognitive functioning is a heuristic act. Hence, though a why-question will ostensibly elicit an analysis, it will elicit a report if the teacher's focus is the recitation of a textbook's analysis rather than the class's reflection, In such a situation, "Why?" really means, "According to your text, why did it happen this way? Do you remember?"

§1.7.2. Generalization/Analysis. Generalization is the derivation or induction of a general conception or principle from particulars, typically in response to an open-ended question. Analysis is the determination of the nature and relationship *r* of parts in a whole entailing two or more stipulated particulars or concepts *a*, *b*. In analysis the teacher typically stipulates terms for consideration (e.g., *"Given what we've just said, given a and b, etc., what's the author's point?"*) whereas in generalization the teacher does not stipulate terms for consideration; the students do (e.g., *"What's the point?"*).

Examples of generalization: *What happens when you get to the next stanza? Who are these people? What do you think is the message? What does it mean to be in shackles? What does a tornado do? What's the author saying here? What's it all about?* Contrastive example of generalization and analysis:

TEACHER:	*What did Robert Fulton do? What was the result? How did his success affect river travel? What's a problem that some rivers have?*
STUDENT:	. . .
TEACHER:	*So how did Fulton's success affect river travel?*

In the first question, which is a multiply repaired question, the teacher is working to stipulate the terms of an analysis he wants students to do. The question, *"What's a problem some rivers have?"* is meant to elicit a generalization in preparation for a particular analysis these questions are driving towards: "So how did Fulton's success affect river travel?"

§1.7.3. Factors Affecting Cognitive Level. The cognitive level of any question is affected by: (a) the knowledgeability of the person answering the question, (b) nature of the instructional activity, and (c) the source of information required by the question.

(a) **Knowledgeability** of the person answering of the question. Questions are to be coded as reports when their answers elicit a routine cognitive operation. But note that "routine" varies depending on what the person answering the question knows: The very same

question that elicits an analysis from one person may well elicit a report from another, more knowledgeable individual. This distinction is especially germane to teacher or student questions. For example, "How did the French regain control of Canada?" may well elicit an analysis from students (assuming, of course, that they have to figure out the answer and not merely recite their textbook account on the point), but it will elicit a report if a student asks the teacher, who already knows the answer. Of course, teachers may not have the answers to all student questions at their fingertips, and if the teacher clearly thinks about a challenging student question, as indicated by a pregnant pause, for example, the question is to be considered as an instance of generalization or analysis. Nonetheless, most student questions addressed to teachers will elicit reports. In some low-ability classes, spelling or even pronouncing new and difficult words will require analysis whereas in other classes, where students have already mastered the pronunciations and spellings of the same words, their spelling is a mere, routine report.

(b) **Nature of the instructional activity**. When whole-class instruction is devoted to review, the normal expectation for the cognitive level of the questions is report, even if the questions have the linguistic form of higher level questions. Sometimes, of course, you may encounter teachers who use review as a basis for analysis and reflection, so take this situation into account in your coding.

(c) **Source of information** required by the question. We define "prior knowledge" as "prior to the previous night's homework." Hence, if a teacher asks students about the previous night's reading, the question will normally elicit a report.

§1.8. Coding Ambiguous Questions

§1.8.1. Preformulated Questions (e.g., *"Do you think that's important?"*).

In judging cognitive level of preformulated questions, disregard the preformulator (*"Do you think. . ."*), and code the remainder of the question ("*Is it important?*"), i.e., code only the nuclear utterance (cf. French and Maclure, 1981). Superficially a question such as "*Do you think that's important?*" elicits a record (i.e., what the student is thinking now), but if the real purpose of the

question is to elicit a higher cognitive operation (an analysis of what is important), it should be so coded. Hence:

"Do you think that's important?"="Is that important?"=**ANALYSIS**
"Do you know what a catechism is?"="What is a catechism?"= **REPORT**
"Do you understand why #11 is a 'b'?"="Why is #11 a 'b?'= **ANALYSIS**
"*What do I mean by 'transition'?*"="*What's a transition?"*=**REPORT** or **ANALYSIS**, depending on context student to report. When in doubt about cognitive level, always ask what *mental operation the question is eliciting* (not the literal meaning of the question). Hence, *"Should I do anything more with it?"* should be coded as *"What more should I do with it?"*

§1.8.2. Homework Questions. Sometimes teachers will ask questions about things students have already completed or considered, e.g., homework. If, in answering these questions, students actually consult their homework, the question will elicit a report, since the students are reporting on what they have already done. If the students do not actually consult their homework, however, the questions should probably be coded as if they had been asked the first time, i.e., analysis/generalization.

When teachers ask questions about what students are thinking (and not just to see if they have done their homework), and when they ask them questions about their previous answers, they promote fundamental expectations for learning by seriously treating students as thinkers, i.e., by indicating that what students think is important and worth examining (Martin Nystrand)

§1.8.3. Redirected Questions. Whenever a teacher redirects a question to another member of the class, code the new question with the same values as the original question; use DITTO. This includes uptake, authenticity, and cognitive level. For example:

Eugene, can you tell me a bit about it?	*T A Report*
Mike?	*T A Report*

§1.9. Coding Responses to Questions

> *Meaning is realized* only in the process *of active, responsive understanding.... Only the current of verbal intercourse endows a word with the light of meaning.* Valentin Vološinov

§1.9.1. Principal Codings

- Relation to other responses. One part of multiple response (y/n). When teachers encourage or allow multiple responses to a single question without repeating the question, it can indicate a transition to dialogic interaction in the class.
- Identity of respondent. In the text box next to this prompt, type in a code identifying the respondent.

§1.9.2. Teacher Evaluation/Followup: Elaborated vs unelaborated.

Elaborated responses show thinking and offer a rationale for the answer given (two parts: answer + elaboration). Unelaborated responses provide just answers, typically with just the information the question targets.

§1.9.3. Teacher Response to Student Questions

Coding teacher response to student questions. Whenever a student asks a question, you will be prompted to code the nature of the teacher's response: T response (C/A*/O) where

C = Closing down: Tabling , changing the subject (perhaps with a different question)
A = Answering (default), either elaborated or unelaborated
O = Opening up: Asking for more information, rerouting question to class.

§1.10. Classifying Instructional Activities

§1.10.1. Lecture. Lecture is to count as a segment only when the teacher talks uninterrupted for at least 30 seconds.

Lecture, film, video, music also refers to student consumption of recorded material, such as documentaries, fiction films or books on tape.

Lecture deals with English content, not with instructions for class activities. Code as Lecture when teacher is talking about skills or knowledge which will be generally useful to the student in the future. For example, "How to do a bibliography" may be Lecture, but "You may only have one Internet source in your bibliography for this paper" would be Procedures and Directions.

§1.10.2. Discussion. We define discussion as free exchange of information among students and/or between at least 3 participants that lasts longer than 30 seconds. The 3 participants may include the teacher, though the teacher may be deliberately silent during some discussions. When discussion occurs in the midst of question-and-answer, it interrupts or violates the normal initiation-response-evaluation sequence of recitation. Discussions typically include relatively few questions; most often these questions clarify ideas and information (*"By that do you mean . . . ?"*) and are consequently authentic since, rather than quizzing each other, the conversants exchange only that information they actually need to know. Discussion displays regular uptake so long as the conversants listen and respond appropriately to each other. Typically discussion comes about in question-answer when a student volunteers an observation (not a question) that substitutes for teacher evaluation.

> *Ms. Lindsay's class was about figuring things out—in class, face-to-face, teacher and students together.*
> **Opening Dialogue**, p. 2

§1.10.3. Student Presentation: Quick vs Careful

- Quick: Students have only the class hour or less to prepare.
- Careful: Students have prepared at home or during previous class sessions, and it is clear that this counts as more than a daily grade.

§1.10.4. Reading Aloud generally refers to students reading aloud. Teachers reading aloud an excerpt to illustrate a lecture point counts as lecture; however, teachers taking their "turn" in the reading aloud of a class text counts as Reading Aloud. Tapes of someone reading aloud count as "lecture, film, video, music."

§1.10.5. Role Play or Simulation: An open-ended activity where students take on a role or put themselves in another's place. Example: The class having a "town meeting" of characters in a story, or choosing lots before reading "The Lottery." Sitting in seats and reading parts from a play is reading aloud. Students preparing and then presenting a scene can be either Student Presentation or Role Play, depending on how faithful they are to the class text.

§1.10.6. Game: A structured activity with rules, points, winners, losers. Examples: Pictionary, Vocabulary BINGO.

§1.10.7. Class Interruption: An interruption originating outside the class interrupts class activity. Examples: intercom announcements, visitor, CELA paperwork.

§1.10.8. Seatwork. Seatwork is coded according to Source, Cognitive Level (see above, question coding), and Who organizes the product, as well as Type of writing, if any.

§1.10.8.1. Writing Without Composing: all mechanical uses of writing:

- Multiple-choice exercises

- Fill-in-the blank exercises (answered with less than a sentence)
- Short-answer exercises (brief, one or two sentences per question)
- Writing to show memorization (e.g., science or math calculations, spelling tests, written recitation)
- Transcription from either written material (copying) or (dictation)
- Translation (copying words or short phrases from one language into another)
- Other mechanical uses (diagraming, vocabulary exercises, crossword puzzles, pre-first draft activities, e.g., concept mapping)

§1.10.8.2. Composing: writing that is informational, personal or imaginative.

§1.10.9. Small Group Work. Small group work is to be coded for the following:

- Teacher-structured group work (i.e., collaborative seatwork). Task parameters entirely defined by teacher. Task can be done without student interaction (e.g., worksheets); group setting is gratuitous.
- Prescripted task: Prescripted task with obligatory student interaction.
- Limited student interaction: Teacher gives students some latitude in their interactions with each other, and group work involves spontaneous student interaction concerning substance; students are on "short leash." For example, the teacher might define some general principle which students in groups must then apply.
- Significant student interaction: Significant student interaction, including discussion, defining shape of task and outcome though teacher might have been able to predict results before class.

- Autonomous group work: Teacher sets up group work without prescripting activities; significant student interaction, including discussion, defining shape of task and outcome. Results of group work cannot be predicted before class.

§1.10.10. Offtask. See pp. 14, 15.

§1.10.11. Discipline.

We distinguish between admonitions, for example, asking some students to pay attention ("Helen, pay attention"), and discipline, when the teacher brings a halt to things ("Alright, that's it!") to straighten out a more serious problem. When the teacher seems to be dealing with a nuisance, it's an admonition; when the teacher shifts gears to address a problem, it's discipline. CLASS is to be used only for noting discipline.

§1.10.12. Shifting Numbers of Students.

Sometimes students will enter and leave the class during the period. When the number of students changes, indicate this number when so prompted by the OFFTASK routine.

§1.10.13. Ambiguous Activities.

When the teacher does one thing (e.g., lecture) and students are allowed to do another (e.g., seatwork), classify the activity most students do.

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