Prepared for submission to the

Journal of Personnel Evaluation in Education

The Implications of Coteaching/Cogenerative Dialogue for Teacher Evaluation: Learning from Multiple Perspectives of Everyday Practice

Wolff-Michael Roth
University of Victoria

Kenneth Tobin
University of Pennsylvania

All correspondence concerning this paper should be addressed to Wolff-Michael Roth, Lansdowne Professor, Applied Cognitive Science, MacLaurin Building A548, University of Victoria, PO Box 3100 STN CSC, Victoria, BC, Canada V8W 3N4.

E-mail: mroth@uvic.ca. Tel: 1-250-721-7885. FAX: 1-250-721-7767.

The Implications of Coteaching/Cogenerative Dialogue for Teacher Evaluation: Learning from Multiple Perspectives of Everyday Practice

Abstract

In this article, personnel evaluation is reconceptualized in terms of coteaching, an epistemology and methodology for teaching and learning to teach that is grounded in the collective (societal) motivation of preparing the next generation of citizens. Coteaching engages all participants (teachers, student teachers, supervisors, evaluators, and researchers) in the effort of helping students to learn. Central to coteaching are cogenerative learning sessions in which those who share a classroom experience (teachers and students) collectively construct local theory with the intent of improving the learning of students. Because our studies have been conducted in urban schools, in which often the least qualified teachers end up teaching, our work is particularly relevant to improving teaching in these most needy contexts.

Teaching is evaluated in numerous ways and, depending on the purposes of evaluation, the validity of the performance measures on which decisions are made may be crucial to the teacher and the institution in which the teacher practices. Cases in which valid measures are essential include those in which legislatures and school systems have decided to assess teaching for purposes such as earning tenure, promotion along a career ladder, merit pay, and holding teachers accountable for pupil achievement. Teacher evaluation is also important in teacher education. The field experience is a critical component of teacher education programs and valid assessments are needed to guide decisions on whether individuals can teach effectively and thereby earn a degree and certification to teach. Accordingly, in inservice and preservice contexts there is a significant amount of teacher assessment occurring and important decisions are made on the basis of the measures obtained. We are therefore concerned with questions such as, Are measures of teaching performance dependable for the purposes of their intended use? Are the data on the basis of which decisions are made trustworthy, credible and dependable? Can the measures be used to differentiate individuals for decision-making purposes? Can the performance of individuals be dependably compared to given criteria and judged to have surpassed or fallen short of given benchmarks? Issues such as these are at the heart of teacher evaluation. Fundamental to all questions are epistemological and ontological issues about the nature of teaching.

Whether an approach to teacher evaluation is considered viable depends to a significant extent on how teaching is theorized. For example, if teaching is framed in terms of Shulman's tripartite system of content knowledge, pedagogical knowledge, and pedagogical content knowledge then attention can be focused on assessing criteria associated with each of these categories (Shulman, 1987). A significant part of such assessment systems uses teachers' oral and written rationales for their actions, rationales that are grounded in the three categories. On the other hand, if teaching is regarded as a knowledge form that is only evident in praxis, a form of teacher evaluation that focuses on teaching in specific contexts is

likely to be emphasized. In these circumstances, social theories that address the conscious and unconscious dimensions of action, such as those of Bourdieu (1992) and Giddens (1984), seem highly appropriate. Thus, speaking to teachers about what they do and why they do what they do will not necessarily determine whether given actions were or were not rational (Bourdieu, 1990). In addition, taking into account the social and cultural milieu in which teaching occurs is easier to exhort than it is to accomplish. Can teaching performance ever be considered independently of the social and cultural contexts in which curricula are enacted and be considered independently of the evaluation process? In this paper we make the case that teaching is a form of praxis that is always inextricably situated in some social and cultural milieu. Thus, evaluations of teaching are always specific to time, place and the particularities of context. In the following sections we explore a variety of issues associated with teacher evaluation in which we coteach with practicing and new teachers[1] in an urban high school in the North East of the United States. Specifically we address coteaching and cogenerative dialoguing as components of an approach to teacher evaluation that has numerous potential applications to schools and the field experience components of teacher education programs. Rather than making evaluation a process external to teaching, with its tendencies to objectify teachers and teaching, coteaching/cogenerative dialoguing makes evaluation part of the everyday work of teachers, students, and supervisors.

Core Issues

Today is my big day. Mr. Ernst, the person from the Ministry of Education who will evaluate my teaching and determine whether or not I will receive my Ontario Teacher Certification, is coming to my classroom. I am tense, thinking about whether the lesson I have planned will meet the expectations of the evaluator. I hope that my students play the

[1] We use the term 'new teacher' in preference to 'student teacher' or 'prospective teacher' because these latter terms are inconsistent with coteaching, which is premised on the ideas that we learn to teach by teaching (as distinct from observing, studying or reflecting on teaching) and that learning to teach is a continuous 'becoming-in-the-classroom'.

game—I have prepared them in that I told them how important this visit is to my own career.

During the lesson I do not teach in my normal way. Not only am I over-conscious about what I am doing but I am also aware of my desire for Mr. Ernst to have a favorable impression of my teaching. I planned an activity on the computer, where students can explore the motion of physical objects by conducting their own experiments. Although I would have done this activity anyway, I am concerned that Mr. Ernst will think I have staged it for his benefit. In a sense the lesson is staged because I thought more than I usually do about the activities, their legitimacy in terms of my epistemology, and the extent of their fit with the provincial curriculum guidelines.

When students have problems understanding, or when they get stuck, I immediately think about the effects of their learning difficulties on my evaluation. I am sweating, which I never do while teaching—this event brings back memories of an unpleasant experience when, in a similar evaluation in a different school and province a student publicly announced my sweating and trembling to the class. 'You're sweating and shaking. Are you scared because of the person watching you?' Despite my tension and fears, the lesson eventually comes to an end. I am relieved that the lesson is over, but I am still worried about how Mr. Ernst has perceived what has happened and how the evaluation has come out.

It turned out that Mr. Ernst had been very pleased and remarked to the school administration that he had observed an exemplary teacher. Even though all of my teaching evaluations have been positive in this way, and supported with commendations from my various superintendents, my level of anxiety is high each time I am evaluated.

*

In this (autobiographical) account of personnel evaluation from the perspective of a teacher, we notice several important aspects that frequently are not taken into account in the supervision and evaluation of teachers. It is clear that the presence of an evaluator changes

the situation. No longer is the primary goal of teaching to afford student learning. Instead, the principal goal is for the teacher to demonstrate effective teaching to an external evaluator who is trained to decide what is and what is not effective teaching. Not surprisingly, many teachers are uncomfortable with the idea that an outsider can validly assess the effectiveness of their teaching in a classroom that is normally shared only by a teacher and the students. In the context of such evaluations many teachers plan and enact special lessons contrived to show their effectiveness on specified competencies, to teach in ways that are convincing to an external evaluator. In such circumstances teaching often is enacted in ways that are mostly deliberative and conscious and thereby markedly different than the teaching that occurs normally.

From the teacher's perspective the goal of the activity in the above vignette was to obtain certification rather than to afford the learning of his students. The teacher enacts teaching to demonstrate his effectiveness and an external evaluator comes to a decision by comparing the narratives and scores constructed from the observation with some standard. In this way, the decision is based on comparing one representation against another (sometimes non-articulated theories of teaching competencies). In the construction of the data on which the decision is based, a material record is constructed. This record stands for the individual teacher and his actions. That is, the teacher becomes first objectified in the record of his teaching effectiveness, on the basis of which a comparison is conducted with performance standards or benchmarks, which then supports a decision of whether or not to certify. That is, the decision to certify or not is abstracted from the individual subject and his teaching. When evaluation involves teachers who are already tenured, a negative outcome may lead to a recommendation for (compulsory) professional development and the teacher might be denied privileges such as merit pay or promotion. Prescribed "professional development" usually is to be achieved in terms of taking further course work, by working with a coach, etc. Teachers are constructed in terms of deficits, to be overcome through additional professional education that frequently is disconnected from the praxis of teaching. It is a

rare event for professional development activities to be situated in the classes in which teaching and learning are regularly enacted.

In this article we describe a radically different approach to the evaluation of teaching. Through coteaching we are able to merge the usually separate activities of professional development, supervision, evaluation, and research. In coteaching, several, traditionally differently located individuals (teachers, cooperating teachers, new teachers, supervisors, evaluators, and researchers) coparticipate as teachers. Shared experiences are evaluated through cogenerative dialogue in which the coparticipants (including students) reflect on the teaching-learning activities. Within a context that is shaped to promote learning, the focus is not on the performance of only one teacher but on the performance of all coparticipants. Accordingly, coteaching constitutes a change in the unit of analysis of teaching, which we study in terms of all the elements that are considered in an activity system. From the perspective of activity theory the following elements are salient to teacher evaluation: teaching, teachers and students (subjects), reproduction of society as the motivation of the activity, tools (such as pedagogy, curriculum, material resources), community, rules of interaction in classrooms and schools, and the division of labor (different roles of the individuals involved in schools).

Activity Theory

Many social theories, such as functionalism (e.g., Colomy, 1998), ignore the significance of human agency in framing what happens in institutions such as schools. Social forces are regarded as shaping the actions of individuals who enact roles according to social structures that persist over time. Approaches such as these have been criticized because they tend to ignore or downplay the contributions that human agents make to constructing and structuring their environments (Holzkamp, 1983; Lave, 1988). That is, human agents are not merely subject to social structures but they actively contribute to their existence (Bourdieu, 1997). Activity theory addresses both the context and agency of

individuals and explicitly assumes that humans are agents of change who act to co-create their (learning) environments and the associated social structures. Human subjects are regarded as active creators of their environments rather than as passive reactants to social forces that predispose them to act in predetermined ways (i.e., as cultural dopes).

Activity theory takes into account the context in which subject-object relations occur (Leont'ev, 1978). Because the subject-object relationship is the primary concern in an activity it is necessary to consider at the same time the effects on the subject-object relationship of the co-mediational relationships involving tools, community, rules, and division of labor (Engeström, 1987). For example, if the student is the *subject* and learning science is the *object* then the salient *tools* that mediate the activity, might be communication, pedagogy and curriculum. These tools are not independent entities but are shaped by social and cultural factors that characterize a community (e.g., school or classroom) such as its rules and the roles of participants. In learning activities, these elements and the mediated relations in which they are situated constitute the environment. That is, activity theory simultaneously and dialectically articulates the human subject, the environment, and the (mutually constitutive) relations between both.

In our approach to understanding classroom events we take a decentered view of teaching by assuming that students are the primary *subjects* of the activity (Lave, 1996). Their primary *object* is (an aspect of) the world; the purpose of teaching is to assist students to change their relations to the world and thereby to provide them with an increased potential to act (Lave, 1993), which is the *outcome* of the activity. In this process, *tools*, including pedagogy and subject matter language, mediate the students' relations to the primary object (i.e., world). That is, the relation between the subject and object is *mediated* rather than being of immediate nature. What makes activity theory less reductive is that subject, object, and tools also are involved in other mediated relations. For example, the society (*community*) mediates the relationship between student (*subject*) and pedagogy (*tool*); that is, because tools have cultural-historical origins, the activity of teaching and the associated

environments are connected to and are mediated by factors from within and outside of the schools. In this decentered view, teaching and learning become matters of collective responsibility.

From the perspective of activity theory, the *object* motivates the activity (here learning); this motivation arises from the intentions of the *subject* (here, the student), which are mediated by the intentions of the *community* (here represented by the teachers). Learning therefore becomes a collective responsibility rather than an individual responsibility. The facilitation of learning is the responsibility of all members in the community, students and teachers alike (including new teachers, evaluators, and supervisors). Furthermore, the identification of contradictions that impede learning, that is, evaluation, also is the responsibility of the collective as is the subsequent removal of the contradictions that we identified.

Activity Theory and Traditional Personnel Evaluation

In the previous section, we introduced activity theory, which describes human activities in terms of sets of mediated relations each constituted by a triad of entities. However, the salient elements accounted for in activity theory and the ensemble of mediated relations are not the only characteristic features of an activity system. In each activity system, there are also contradictions that constitute primary forces that can catalyze change in the system as participants attempt to remove them (Engeström, 1994). In addition, participants may internalize systemic contradictions and adapt their actions to work around them. For example, a teacher may deal with the contradiction of having to perform for an evaluator by setting aside his concerns for student learning and switch instead to a demonstration of teaching competencies that are likely to appeal to the evaluator or that are included in an assessment protocol. In so doing he can be regarded as working around contradictions by staging an event that looks like authentic teaching but which is focused more on teaching performance than the learning of students. Systemic contradictions also may be internalized

and thereby personalized, leading to stress and more serious psychological disorders (e.g., Dreier, 1993). While teaching in urban schools, for example, teachers often will work around a persistent problem of inattentive and disruptive students, focusing not on controlling disruptive students but on mediating the learning of those who want to learn. In this case the work around involves tolerating known inadequacies with the interests in mind of those who want to learn (in a manner that is analogous to one of our student's advice to teach only those who want to learn [Tobin, Seiler, & Walls, 1999]). Work-around strategies such as these can be stressful and lead to burnout and even withdrawal from the teaching profession. In other school-related examples teachers can assume responsibility for deficiencies in the system. For example, to overcome shortages of material resources teachers might purchase equipment and supplies out of their own pockets.

As the introductory vignette shows, teachers often experience supervision and evaluation as stress. From the perspective of activity theory, evaluation often involves an outsider applying a set of culturally and historically developed criteria during an arranged observation of teaching. The evaluation usually incorporates additional "anecdotal" information together with artifacts provided by the teacher and/or other stakeholders. For example, a teacher may provide as evidence of the effectiveness a videotape that shows teaching in different contexts, a reflective journal that includes evidence of reflective practices, and a portfolio containing artifacts of work selected to show the achievement of students. Similarly, a school administrator might submit written records of formal evaluations undertaken in the past semester and a summary of the results of a survey of students' perceptions of their learning environment. These artifacts, which can be weighed to inform a final decision, reflect implicit and non-articulated theories and assumptions. Equipped with a variety of data, the evaluator examines various aspects of classroom life and compares the performance of teaching to established benchmarks. In this way, the entities and mediated relations of the learning activity system are objectified in and through representations (e.g., scores based on comparisons with benchmarks on an evaluation form

and/or a narrative account of teaching) that then can be used to support an evaluation. That is, a complex system of activity and contexts is reduced to a set of attributes that represent the quality of teaching in ways regarded as objective. The process of evaluation leads to the production of records that stand for teaching performance. Invariably these records are "de-subjectified" (e.g., Dreier, 1991) or "de-populated" (Billing, 1994), that is, the subjectivity that constitutes human experience has been abstracted. In this way the evaluation process objectifies the teacher, who is (socially) constructed as "competent," "in need of professional development," or "ineffective." Mehan (1993) shows that evaluations in which the voices of those most concerned are not included in equitable ways can lead to negative objectified (social) attributions and inequities for some of the individuals being evaluated. Mehan illustrates that inequities emanate from hierarchical relations, both existing and enacted, between participants and the socially mediated legitimacy of their knowledge.

Some of the contradictions of teaching arise from processes of evaluation. Given the stakes involved, a teacher to be evaluated puts on a performance, a staged event that is not authentic because of the presence of an outside evaluator and a manner of teaching that is more conscious than normally is the case. In some cases this might be associated with deception and resistance, actions that are typical of hierarchical relationships and teachers' feelings of powerlessness. An example of this would be a teacher staging an inquiry lab activity when the usual approach involved the students completing activities from a textbook, or in the case of elementary teachers, a history of not teaching science at all (McGonigal, 1999; Roth, Tobin & Ritchie, in press). Teachers can experience negative emotions associated with contradictions related to hierarchical power relationships between teacher and evaluator and of being constructed without a meaningful and sufficient voice. Evaluation and the hierarchical relations in the school and school system, which have an effect on the employment status of the teacher, are contradictions that might be internalized by teachers as disaffection and isolation. What can be done where such contradictions exist to alleviate disaffection and stress? Is it possible to create an authentic system of evaluation in which

teachers have a meaningful voice in evaluations of their own performance and that consider the sociocultural contexts in which teaching and learning occur?

Critical psychologists, whose theoretical foundations lie in activity theory (Leont'ev, 1978), suggest that it is not sufficient to deal with contradictions at a personal level (Holzkamp, 1983). Rather, participants have to recognize contradictions as emanating from sociocultural conditions that have to be removed in a collective manner so that participants can experience life as subjective, satisfying, and free of fear (Holzkamp, 1984). In order to achieve this, evaluation necessarily requires a methodology in which all stakeholders (i.e., teacher, students and evaluator) pursue and fulfill common interests. If evaluations are undertaken by external evaluators their experiences of teaching and learning are radically vicarious since evaluation from the side provides no direct access to the action possibilities available in the unfolding moments that comprise teaching and learning (Holzkamp, 1992). Instead of experiencing first-hand the real possibilities for enhancing student learning, evaluators must infer what might have been done and how learning may or may not have been shaped by what was or was not done by a teacher or students.

When it is conducted in this way evaluation is an activity that involves judgments from the side using criteria considered salient (by the evaluator) in the setting. Even though evaluators may be secure in their knowledge, we regard this as false security. How can it be known that particular teacher actions will produce postulated social outcomes? Or, how can evaluators know if actions they recommend teachers undertake are feasible in the unfolding circumstances of praxis? Even in the best of circumstances the recommendations of outsiders can only be regarded as possible narratives for what might have occurred or what might be desirable. Even though evaluators' renditions take into account their knowledge and expertise they include only distant and vicarious experiences of the teaching and learning that are the objects of the evaluation. We maintain that an alternative way of evaluating teaching is likely to be more productive than the traditional "outsider" approach that is so common. Not only does our alternative approach involve insider perspectives but

also the focus of an evaluation shifts from an individual to a group of coparticipants. In our approach one individual would no longer bear the brunt of performance evaluation. Instead, the process would involve cogenerative dialoguing of the experiences shared during coteaching. These conversations are necessarily grounded in what is experienced and thereby they incorporate participants' experiences of salient sociocultural factors including (but not limited to) the interchanges of the social and cultural capital of teachers and students.

For nearly a decade we have studied teaching, learning to teach, research, supervision, and evaluation as unified activities. In the following sections we articulate the context of our research and what we have learned from the research about evaluation of teaching.

Research Context

Our research on coteaching was conducted in two schools on the Canadian West Coast (7 cotaught science units) and in two urban schools in Philadelphia. The present case study was taken from our work at City High School (pseudonym). City High School (CHS) is a placement school for students at the University of Pennsylvania (Penn) enrolled in a graduate-degree leading to teacher certification (i.e., new teachers). We are now in our third year of conducting ethnographic research on the changes in teaching and learning to teach. As part of the research, we changed our roles from outside observers to active participants in teacher preparation and teaching in the public schools (to be more described below). Our current research model is coteaching/cogenerative dialoguing, a form of participatory action research (e.g., Eldon & Levin, 1991), particularly close to those forms of research that pair research and activism (e.g., Cole, 1991; Nissen, 1998).

Kenneth Tobin is a professor in teacher education at Penn and has been coteaching on a regular basis at City High School with resident teachers and the Penn interns. He is a participant who engages in research to transform the different lifeworlds that he shares with students, teachers, student teachers, and colleagues. As a result of his work, the conditions

of learning change in the school and at the university. At the time of the study, Stephanie was enrolled in the teacher education program at Penn. She and a peer cotaught with Bert, a resident cooperating teacher with previous coteaching experience. Michael Roth was a visiting researcher with several years of prior coteaching experience who cotaught with Tobin in different classes at CHS.

City High School is attended by more than 2,000 students mainly from African American, poverty-stricken or working-class families. The school is organized into small learning communities (SLCs), schools within the school, each containing about 200 students and organized around a different core idea (e.g., health, performing arts, or science and technology). The curriculum is often enacted at a minimal attainment level, students rarely engage appropriately in activities, equipment, supplies and textbooks are in short supply, and there appears to be a lack of motivation on the part of either teachers or students to pursue deep learning goals (Tobin, Seiler & Walls, 1999). Conversations with teachers reveal that they often place the blame for this state of affairs with the students and the situations in which they live. Teachers also note a lack of commitment from the school district and a system that permits urban schools to be funded at a level far below that of suburban schools. In a striking contrast the students often place the blame for the inadequate curriculum squarely with teachers and administrators who maintain a curriculum perceived by many students to be a complete waste of their time.

As part of our research, we draw on a variety of qualitative research methods appropriate in school contexts, including ethnography, discourse analysis, and micro-analytic approaches to studying situated cognition. In addition to the usual observational, methodological, and theoretical fieldnotes we videotape lessons and cogenerative dialogue sessions, interview students and (new) teachers, audio-tape interviews conducted by high school student research assistants among their peers, and collect the teaching-related discussions new teachers held using an online internet forum.

To construct meaning, we enact a dialectic process consisting of two movements: understanding and explanation. Immediate understanding of the praxis situation is primary and constitutes the necessary prerequisite of any other form of understanding (e.g., theory) (Ricœur, 1991). However, this primary understanding has to be expanded through a second, explanation-seeking (critical) hermeneutic analysis lest we are to remain ideologically stuck. It is only through explanations that we can identify and seek to resolve the structural contradictions that are of a societal nature (Holzkamp, 1991). This movement from primary to theoretical understanding begins during cogenerative dialogue sessions and is often continued during face-to-face meetings or email exchanges among participants.

Coteaching as Epistemology and Method

In the model of coteaching, learning is explicitly made the primary goal of the activity. Two or more teachers teach at one another's elbow in order to facilitate student learning (Roth, 1998). They take collective responsibility by teaching together, at the same time, rather than dividing up tasks to be done independently as frequently occurs when one elementary teacher teaches social studies simultaneously to two classes and her partner, in turn, does the mathematics classes. As the events of the classroom unfold there are more teachers to deal with them in ways that afford the learning of students. Our research conducted in and as part of teaching praxis evidences significant learning of all participants including teachers, evaluators, and researcher-teachers. Interestingly enough, this learning often occurs in unconscious ways and teachers realize only much later what and how much they have learned while working together with one or more colleagues. Also, it is possible that most of what is learned remains beyond consciousness (Bourdieu, 1997; Dewey, 1933; Giddens, 1984; Lakoff & Johnson, 2000).

Coparticipation is the fundamental condition for research, supervision, evaluation, and learning to become a teacher. All individuals—new teacher, (regular, cooperating) teacher, researcher, supervisor, or evaluator—participate in teaching so that they share symmetrical

mediating relations between students and their knowledgeability. That is, as a teacher collective, we do not condone the involvement of individuals who construct themselves as outside observers *looking at* teaching and learning rather than *participating in* it. Praxis has its own constraints; most importantly, praxis unfolds in time and therefore has local coherence whereas evaluation from the outside seeks global coherence, which is nearly always irrelevant for practical action. There is no time out for practitioners, forcing them to enact their knowledgeability rather than standing back, as theorists and outside evaluators are able to do, to consider and elaborate all (theoretically) possible forms of action (e.g., Bourdieu, 1990; Roth, Lawless, & Tobin, in press). These constraints of the temporality of praxis and the praxis-related limitations in an agent's room to maneuver are available only to coparticipants in praxis. As teaching, evaluation becomes our collective responsibility, conducted by those who have an insider view on the events to be evaluated.

Coteaching experiences are coordinated with meetings during which coteachers and students debrief, make sense of the events, evaluate what has happened, critically reflect on their understanding, and construct local theory and new action possibilities. We call this activity cogenerative dialoguing, for all participants have equal opportunities to contribute to the construction of evaluation and theory. In our earlier form of coteaching, the teachers involved met later in the day (after class, during recess, after lunch, at the end of the school day) to debrief the shared experiences. In our recent work, (ideally two) students also participate in these meetings to make sense, understand what has happened, and construct generalizations and expand action possibilities (e.g., Tobin, Roth, & Zimmermann, in press).

Coteaching is based on an equitable approach to teaching, and in articulating differences between teachers in terms of their different life histories and experiences. The meetings are also based on a strongly participatory approach, in which all participants, including students have opportunities to make sense, contribute to the interaction, ask questions, articulate issues, and so forth. In order to guide our meetings, interactions, and types of issues to be addressed, we developed a heuristic (Table 1) that is made available to all participants in

cogenerative dialoguing so that they can orient their own actions in appropriate ways. For example, when we first presented our heuristic, a student who had previously participated in cogenerative dialoguing noted that she had pretty much participated as the heuristic indicated (#4). However, she also noted that she had never "posed critical questions" (Item #4.4) herself. She used her newly acquired awareness to participate in new ways, that is, by asking critical questions herself.

]]]]]]]]]] Insert Table 1 about here [[[[[[[[[[

This approach necessitates new ways in which traditional roles of new teacher, (cooperating, regular) teacher, supervisor, researcher, and evaluator are understood and enacted. Because the approach is symmetrical in the classroom, traditional forms of critique by one individual (e.g., supervisor) of another individual (e.g., new teacher) lose legitimacy. For example, in a traditional situation a supervising university professor might admonish the new ("student") teacher for not having attended to sleeping students or for having wasted time in a transition from one activity to another. In coteaching, if the supervisor/evaluator observes a sleeping student or notices that the transition wastes valuable learning time, he is obliged (an obligation that is shared and therefore socially mediated within the coteaching group) to act. This does not prevent him from raising the issue during a subsequent meeting.

Our description so far has shown that all individuals participate in teaching and learning; in our original research on coteaching, no fly-on-the-wall observers were allowed to participate. This methodology harbors dangers in that existing understandings could be reified and thereby become ideology. That is, when we use only immediate descriptions of the context, we are likely to remain stuck and reproduce ways of perceiving and acting in a particular context. So, while we need our immediate experience in terms of the concepts that correspond to them, we also need to engage in a critical analysis to come to an understanding that makes salient the fundamental structures of the condition that we are finding ourselves in. This critical analysis requires our personal understanding of praxis but

also a “radical doubt” (Bourdieu, 1992) or “suspicion of ideology” (Markard, 1993) to overcome the possibility that we remain ideologically stuck in our current understanding.

Teaching and Evaluation as Praxis

We begin by presenting sample classroom events from our coteaching experience and excerpts from the subsequent cogenerative dialoguing session where we talked about what has happened. We then use a metalogue—which is reflexive of the way we made sense in the research—to elaborate what we can learn from the coteaching and cogenerative dialoguing episodes.

Coteaching

Episode 1

The new teacher Stephanie had planned two activities on scientific method, a core area for the citywide standards and an associated standardized test, for this 90-minute lesson. However, as the first lesson unfolded, Stephanie noted that students, in order to draw maximum benefit for their learning, required more time than she had planned. When the activity was finally completed, Stephanie realized that there was not enough time left in the period for students to complete the second activity. She and her supervising teacher (Bert) decided that they would first review what they had done so far in genetics. As she prepared the overhead projector she realized that she had used up the only available transparency earlier in the day and therefore sent a student to get it cleaned. There is a long moment of inactivity; “nothing” appears to happen. The videotape shows Stephanie walking to the door, as if looking for the student who had left the classroom. Ken (Stephanie’s teaching methods professor), sitting among the students, drums his fingers on the desk and suggests to Stephanie that she might quicken the pace of the transition. He then encourages the participation of Keesha who has her head down on the desk. Soon after a student returns with a clean transparency sheet and Stephanie begins the review of Mendelian genetics.

Episode 2

In this second episode, we are in the middle of the review of Mendelian genetics. Stephanie writes pairs of letters on the transparency and asks students to name (scientifically) various gene combinations that she writes down as ‘BB,’ ‘Bb,’ and ‘bb.’ Stephanie then asks Keesha to demonstrate what characteristics an offspring would have based on a given gene combination of the parents.

Stephanie: Excellent, little ‘b’, little ‘b’, so we got homozygous recessive (makes a note on the acetate). And what is the last condition?

Several students: Heterozygous. Little ‘b’, big ‘B’…

Stephanie: Heterozygous, awesome. Homozygous recessive means that there are two recessive genes. Keesha, come around.

Bert: A good way of remembering this… someone just said phenotype, genotype, and you gave the correct answer. An easy way of remembering this is…. Just think of the first letter. A ‘p’ for physical expression, for physical appearance. A ‘g’ for the genes. So if you ever get confused, genes, genotype, physical expression, phenotype

Stephanie: (Keesha has arrived at the overhead projector.) All right, Keesha is going to put this on the overhead for us.

As Keesha has to walk a considerable distance to get to the front to construct the Punnett Square, there might have been a lengthy transition. Bert anticipates and uses the time taken for Keesha to walk to the front as a “teachable moment” and volunteers information that will assist students to remember how to relate the scientific terms of “phenotype” and “genotype” to their more familiar language. Bert, in effect, builds a bridge between two forms of language, one that students bring to class and another that is appropriate in the context of formal science. At the same time, his intervention effectively uses time that otherwise might have simply been transitional time.

Episode 3

Stephanie completes her review and seems ready to enact a transition to the next part of the lesson. Michael raises his hand as a sign that he wants to contribute to the ongoing

lesson. Stephanie provides the space him to coparticipate and engage students in a conversation about a real-life genetics problem.

Michael: I wonder if anyone can figure out a little bit about my family? So, I have blue eyes and my wife has blue eyes. I was wondering whether you can figure out, what color my son's eyes are?

Natasia: Blue eyes.

Michael: Why would they be blue?

Natasia: You have blue eyes, she has blue eyes…

Stephanie: This is a good question.

Natasia: She has blue eyes and you have blue eyes, you all must have recessive genes.

Stephanie: OK, let's think about that (begins to write). Let's list the possible…

Natasia: Make them have all the different combinations…

Stephanie: Excellent, excellent. A good point. (Turns to Michael) I am glad you brought that up. Natasia has a good point. Let's list all the possible genotypes. OK. He has blue eyes. Question. So phenotype is blue? So what are the possible genotypes he may have?

*

Voice over (Michael): Earlier in the lesson I attempted to help a student in the other half of the class working out a genetics problem. I was not successful for she did not understand me. I thought her failure to understand was partly because she was not used to me and did not construct me as a teacher. But I waited to see what Bert would do and to learn how to teach students like these. He began to talk to her using words such as 'heterozygous dominant' and 'homozygous dominant'. She stopped him saying, 'Why you giving me big talk with words that I don't understand?' So I realized that students might find it difficult to relate to the topic and I wanted to provide a very practical example. This example and the one I provided right after, which introduced a quite different perspective, seemed necessary to make the lesson more concrete and palpable to students. Rather than waiting until I could talk to her about being too abstract and about using more practical examples, I enacted such

an example right then and there, when it was most appropriate. My strategy appeared to payoff because Stephanie later used an example from her own family modeled on my contribution. She appeared to have learned and in the same lesson enacted a relevant practical example from her own family.

*

Episodes 2 and 3 are common to our work in the sense that rather than sitting in the back of the classroom, constructing an evaluation that they subsequently give to Stephanie and then use to evaluate her teaching, coteachers (Bert and Michael) move in and teach. Rather than admonishing Stephanie later for a long transition, Bert sets an example of how periods of transition can be transformed into moments for additional teaching and learning. Rather than admonishing Stephanie for not having made the lesson more concrete, Michael requests a turn and enacts a whole-class conversation around a concrete genetics problem. In contrast, episode 1 is exceptional in the sense that Ken experiences a long transition but does little to use the time more productively. Instead he exhorts Stephanie to quicken her pace of teaching. This is one of those moments that are indicative that we are still in a mode of changing and adjusting to a different way of evaluating and researching teaching.

Cogenerative Dialoguing

Case 1: Transitions

During cogenerative dialoguing, where we make sense of the lesson that we had experienced together, Ken raises the issue of the long transition from the first activity to the moment when Stephanie finally begins the lesson. He asks whether Stephanie had overheard his comment. With Stephanie's response, the topic of transition became the topic of the conversation. Stephanie accepts the responsibility for the delay.

Ken: What did I say?

Stephanie: 'I am falling asleep. Keep going'

Ken: That's right, I said, 'come on, come on, come on, you are driving me nuts. If I were a student in this class, I would be falling asleep.' How can you work your way through periods like that? I know you had plan A, which was to do whatever. And you didn't have time left to do plan A, … and so you had to switch to plan B, but the transition was…

Stephanie: Right, it was long…

Ken: It was really long. And I was next door to someone who was battling... Maybe she is one of those who go to sleep in every period. Who knows? But she was battling to show any interest at all. So what she needed, I would say, is a fire lit under her. How could we have...? I mean, I don't have any answer... but we didn't need a long transition there... you were between activities and had to wash the transparencies...

Stephanie: Well that was the problem. I mean the problem was, I had to decide. Like I had planned that we make mobiles and stuff, with the scientific method. And I realized that there would not be enough time. And I had all that stuff laid out. So I thought we could get into genetics and do a dihybrid cross. And a student had written all over the acetate, as they were supposed to, and we had to wash them all off.

Ken: That's good, but... so? It was down time...

Stephanie: Maybe get a discussion going, like have a question or something like that...

Natasia: Sometimes she lets us... just to sit and relax for a few minutes. But you can't, like sometimes it is too long, and like...

Case 2: Real-life Contexts

In this episode Natasia raises the issue that her interests are not being met in opposition to the claim made by Bert that he focuses on students' interests. However, there appears to be a deeper concern about the relevance of the subject matter to real life situations. In the following excerpt from the cogenerative dialogue Natasia makes an important contribution to the evaluation of the learning environment.

Bert: With the students in the class, I have always had a good relationship in terms of maybe what they like to see taught, or techniques, you know, or what their interests are, so you always have that openness.

Natasia: My interests are not met!

Michael: What is that?

Natasia: The zoo. Right? Because you can actually do DNA research in the zoo.

Stephanie: She is dying to go to the zoo. She is talking about it every day.

Natasia: I do. I really do.

Ken: There is the new primate exhibition.

Natasia: Yeah, and you could like, multi-colored, like the hair color of the monkeys. This is stuff like DNA, right?

Stephanie: Doing crosses and things like that.

Natasia: So I always thought we could make a trip to the zoo. Right?

Natasia makes more than the claim that her needs are not being met. She provides a practical example of the zoo as a site where the current curricular topic genetics could be contextualized. She elaborates this issue after Ken mentions the primate exhibition that was recently established. Natasia suggests that they could investigate monkey hair color, which is a function of inheritance and DNA.

This episode is interesting from the perspective of the relations that are enacted in cogenerative dialogue sessions. Traditionally hierarchical relations, here between a student and her teachers, are flattened in the sense that Natasia can provide constructive criticism without fear of reprisals. Her claim contradicts her teacher's perception that he is in tune with and meets students' interests. Unusual for our common practice (a "negative case" [Guba & Lincoln, 1989] so to speak) is the fact that Stephanie ends up taking the blame for the long transition. Ken raises the issue and tacitly makes Stephanie responsible for the long transition. Michael and Bert are complicit in not mediating the conversation and helping to construct the long transition as a matter of collective responsibility.

Metalogue 1[2]

Michael: Episode 1 is really quite unusual for our research and our commitment to the principle "don't blame others if you don't or can't take care of the situation yourself." But the issue then came up in our cogenerative dialoguing. This episode really stands in contrast to the other two episodes that are characteristic of what we do. If we notice something that can be improved in the lesson, one of us will immediately attempt to make this improvement. Thus, in Episode 2 Bert makes use of a transition to provide students with a mnemonic that can help them to remember the words "phenotype" and "genotype." In Episode 3, I contribute an everyday example in which the somewhat abstract talk about "little and big Bs," "homozygous" and "heterozygous" individuals, and "genotype and phenotype expressions" is brought to a concrete (because familiar) level. Both are examples of situations where we take collective responsibility and, in this, promote the learning of students and coteachers alike.

Ken: I can see where you are going with your argument and I agree that my actions in the classroom and the cogenerative dialogue are probably a throw back to earlier times and roles. I appear to have enacted my role habitually without being conscious of what I was doing. A critical issue in coteaching sessions is to deal with the events as they unfold in real time. These classes are so event full that it is not possible to be everywhere at once and resolve all issues of which you are conscious. We pitch in when and as we can with the goal of improving the learning of students. My habitus of being an evaluator "from the side" seems to have overridden my goal to coteach and assume collective responsibility for what happens. During the cogenerative dialoguing we all should feel comfortable in raising issues of which we are aware. This is not an occasion for self-congratulatory remarks, but an opportunity to learn from our discussions of shared experiences.

---

[2] According to Bateson (1972), metalogues are conversations in which previous texts and dialogues are brought to a new more general level by abstracting themes from previous accomplishments. Metalogues are reflexive of the dialogic manner in which we make sense as researchers and evaluators.

Michael: When the long transition came up, your critique and our reactions did not contribute to make us collectively responsible. Stephanie was in a defensive mode; Bert and I did not contribute and thereby allowed the failure to be attributed to her. Natasia contributed interesting insights of what can be done or that a long transition can give students a needed rest. But these comments did not redistribute the responsibility for the long transition. Really it should have been a critique of our collective teaching rather than just Stephanie, for we were all responsible. In the other episode from our cogenerative dialoguing session, Natasia articulated a need that was not being met in this classroom. She thereby contributed to evaluation of teaching, and thereby enacted her part of a collective responsibility for learning and teaching.

Ken: That is a good point. I cannot say for sure why I raised the issue of transition to begin the cogenerative discussion. But wasting time is a pervasive problem in the school. Most new teachers and experienced teachers have problems in teaching an entire 90-minute period. Typically we start late, finish early and in every transition students exhibit what I describe as the "urban shuffle." Transitions and activities take about three times as long as I believe they should. During these long transitions particular students are bricoleurs and use the time to pursue some of their own goals. Some lose interest and others put their heads down as happened in this class. So, the length of transitions is an issue of which I am conscious and concerned. I would like all teachers and students to work together to extinguish the urban shuffle.

There is also an issue of Stephanie's degree of comfort of coteaching with me. Until today, Stephanie was not happily participating in coteaching. Prior to today Stephanie looked somewhat exasperated when one of us stepped forward to coteach. I had spoken to her about it and she understood the desirability of providing coparticipants the space to get involved. I guess I was sensitive to her previous reticence and opted not to enact another activity while the transparency was being cleaned. I did attend to Keesha who had her head down but did not initiate a short activity as Bert did in the other case.

I think the best way to go into cogenerative dialoguing is with a conviction that any issue can be set on the table without judging or assigning blame. I do believe in your point about collective action and collective responsibility. During the lesson and the cognerative discussion I was not conscious of this aspect of my role. I am only too aware that I have long transitions when I am the lead teacher and the urban shuffle is characteristic of all classes in the building. Bert too experiences this problem. By raising it I put it on the table for discussion and reflection. I expect it to come up again and again. It is not essential that we deal with each issue fully on the same day that it is introduced. It would be most unfortunate if Stephanie were to feel diminished by me raising the issue and suggesting the long transition was her fault alone.

Michael: I think that we can take this case to yet another level and frame the situation in terms of the larger activity system and the relations that mediate the classroom events that we experienced. That is, we can come to understand that event as the result of a structural contradiction that was personalized and attributed to Stephanie. In a traditional evaluation model, she might have been blamed (made responsible) for the long transition period. It is not surprising, then, that Stephanie framed the problem in terms of the transparencies that had been used previously and now needed cleaning. This is a framing in terms of immediate understandings. However, we need to step back and realize that insufficient numbers of transparencies (or lack of an acetate roll...) really is a structural problem, one that arises from inadequate funding for urban schools. That is, we need to expand the notion of collective responsibility to include those individuals, such as principals and superintendents, who can assist in bringing about necessary structural changes. What we need to do at this point is to ratchet up the analysis and look at the problems not in terms of our own deficiencies, but as larger structural problems. Now, what are our options in this situation? How can we transform the structures in order to have access to sufficient resources so that the particular problems are not internalized (e.g., teachers having to buy these resources out of their own pockets, or internalizing the contradiction in terms of stress, etc).

Ken: Your points about institutional and structural constraints are of significance to teacher evaluation. Stephanie (and we) had to contend with a cascade of events that led to a long transition. Social and cultural factors contributed to the lesson unfolding as it did. For example, the nature of participation is a reflection of the students doing what they are able to do and needing scaffolds to do some things that we want them to do. How can we assist students to build a sense of urgency into their participation? I do not see students being impatient because there is insufficient time to get done all that they want to do in 90 minutes. Instead I see even the best of students shuffling through the activities. What is needed to sustain an inquiry-oriented learning environment is probably much the same in suburban and urban schools. However, for the most part the teachers are from the middle class and know how to provide appropriate scaffolds for students from social backgrounds that are similar to their own. I think we all need to focus on how to recognize the social and cultural capital that our students possess, such that we can provide appropriate scaffolds to enable them to approach learning in a more energetic and sustained way. As we discuss elsewhere, Stephanie is much better able now to enact science curricula that take account of the dispositions of our students (Tobin, Roth, & Zimmermann, in press). Even so, there is more to be done and the enacted curriculum supports minimal levels of learning for most students.

Michael: With our changed approach, evaluation really comes to focus on student learning rather than on teacher performance; evaluation also becomes a collective responsibility of the participants rather than of one designated individual. An evaluation will be largely positive when the participants have both the sense and evidence that learning is fostered whereas it would be negative if the needs of students are not met. However, because these cogenerative dialogue sessions are built into coteaching, change and ongoing improvements are built into the activity system by design. We do not need the anxiety-ridden situation where external evaluators come into a classroom but rather have evaluation as part of the process, conducted by the stakeholders themselves. We may now think of

evaluators in terms of their mediational roles for increasing the learning potential of teacher-student collectivities from the inside.

Ken: As we enact cogenerative dialogue there is a tacit agreement to honor each person's voice and endeavor to learn from what is said. There is an acknowledgement that the purpose of the dialogue is to assist us all to learn better how to teach students like these students in this classroom (and those participating in the cogenerative dialogue). The basis for successful cogenerative dialogue is mutual respect and rapport among the coparticipants. The explicit goal is to learn to teach in a particularized way through coparticipation in conversations over shared experiences.

Metalogue 2: Coteaching and Teacher Evaluation

Michael: Some years ago, a chapter in the Review of Research in Education suggested that the "social relationships of education—the relationships between administrators and teachers, teachers and students, students and students, students and their work—replicate the hierarchical divisions of labor."[3] I think that coteaching significantly changes these relations. With the leveling of the relation between (new) teacher and supervisor, coop teacher and evaluator, previously existing hierarchical relationships are undermined and re-enacted in the form of cooperation in the service of a (societal) motive: assisting students in their learning. While teacher-student relationships do not have to be inherently asymmetrical, it still is perceived and enacted in this manner even in our coteaching classroom. However, we are taking steps to overcome this contradiction by including students in cogenerative dialogue to construct local theory (praxeology).

Ken: Eli Anderson[4] speaks about the currency of the streets being respect. In this school it is important to know this. If teachers do not show respect for students and expect respect from them (by earning it through their actions) then it can be very difficult to teach

[3] Pinar & Bowers, 1992, p. 165.

[4] Anderson, 1999.

effectively. So, when you speak of a symmetry in the relations between the teacher and students I see this as primarily involving mutual respect for one another while appreciating that the student and teacher have somewhat different roles that will evolve continuously and recursively in the contexts of schooling. I have been impressed in almost every cogenerative dialogue by the helpful and mature conversations involving students. I can think of only one instance in which a student used the setting to show his contempt for teachers and teaching. My interpretation of this student's actions is that he endeavored to humiliate the teachers and thereby gain the respect of a peer who was involved in the discussion.

Michael: Making supervision and evaluation a central part of an activity system rather than an activity that comes from the outside to objectify and disenfranchise the primary stakeholders seems to me the crucial move that our coteaching model enables. Furthermore, when evaluation is a collective responsibility, participants are empowered to construct the context of their activity to maximize its outcomes.

Ken: So what does this all say to the issue of assessing teacher performance? This is a hot issue now and has been historically. Rightfully society demands well qualified teachers who do their utmost to afford the learning of their students. Coteaching has the potential to blur the traditional boundaries of evaluation and professional development. It seems to me that something that is very analogous to formative evaluation occurs in coteaching when an event arises and one of the coteaching partners participates in that event using what Dewey has referred to as a habit, an unconscious way of enacting teaching. As events occur, and coteachers act, they use their Spielraum to afford student learning. All coteachers experience what happens, some consciously and others unconsciously. The direct experience of the teaching of others can lead to the adaptation of a teacher's teaching habitus such that when a similar event arises in the future the teacher deals with it appropriately and without a conscious awareness of either the event or the associated teaching. On some occasions the actions of a coteacher will not be expected and for that reason they are noticed. These

noticed actions can then be foci for cogenerative discussions and set a context for the building of a new teaching habitus.

Conclusions

The application of activity theory to the evaluation of teaching began with a vignette in which a teacher was assessed by an outside evaluator. He described how the event became staged in that the focus shifted momentarily from promoting the learning of his students to one of ensuring that he demonstrated teaching competence. The contradictions that are made visible from our analytic approach were manifest in this case in terms of the teacher's stress in dealing with them. We have shown through our examples how coteaching can set a context for ongoing evaluation in which the focus is on teaching with the intent of enhancing the learning of the students. The goal becomes one of learning to teach students like these at this time and in this place. Elsewhere we have described how coteaching is an ideal context for learning to teach (Roth & Tobin, in press). Here we have shown that coteaching also affords evaluation of teaching in a collective sense that is analogous to embedded formative assessment (Black & William, 1998). The evaluation associated with coteaching can inform the praxis of all coteachers not just a new teacher. However, there is still a need for summative evaluations of teaching. Can this teacher teach this class in these circumstances? The certification decisions that affected the teacher in the first vignette are going to be necessary to ensure that we get the best teachers to teach our students. So, to what extent does our research on coteaching shape our perspectives on summative evaluation? We hasten to say that we are not advocating a methodology that will meet every emerging contingency. Coteaching is not offered as a master narrative that operates as a panacea for all situations that require an evaluation of teaching. However, we do see applications of coparticipation to summative evaluations. For example, we cannot condone from the side "external" evaluations as legitimate practice. Instead we see advantages in coteaching for a period of time so that first hand experiences are obtained of the teaching of

a teacher for whom a summative evaluation is needed. Then, recognizing that those who are empowered to make such decisions need to make them, we see cogenerative discussions as setting a context in which the voices of all stakeholder groups can discuss events and phenomena deemed salient to the decisions that are necessary. The forum of the cogenerative dialogue sets a context in which there is an awareness of the extent to which teaching was viable for this class at this time.

With the proposed epistemology of teaching and learning, we expect changes in the way teacher evaluations are undertaken. Examples of changes that are possible have been observed in different European countries where labor process evaluation has changed from external evaluations (often conducted by more powerful managers) to self-evaluations that are conducted by each team of workers. The evaluations within the group involve all members in more equitable ways. Middle managers formerly responsible for monitoring and increasing productivity have been eliminated and some of the salary savings are redistributed within the group among those who best scaffold learning and productivity within the group. As a result, the workers themselves have become more productive and have assumed control for the activities in which they are involved. In a similar way, we may expect students and teachers to assume greater responsibility for the quality of the processes in which they are involved. Former roles of evaluators may be abandoned in favor of a variety of different coteachers, whose roles nevertheless remain focused on affording student learning and improving learning environments. We can even envision that a particular coteacher remains with a class for a number of lessons to participate in changes that have been identified as necessary within the group.

*

Michael: When educators think about quality of teaching, they focus perhaps too much on summative evaluation as an index of ability. We have to ask the questions, Who gains from summative evaluation? Is summative evaluation necessary or are there other means of assuring quality of education? Who should be involved in the evaluation process? How

should the process be structured? Do existing forms of evaluation take account of the learning potential of the individual teacher and that of the collective? I am thinking of a learning potential that is enhanced when teachers have opportunities to work alongside a peer for a while. As for teaching, I cannot imagine why there should be summative evaluation for the purpose of making decisions once an individual has been accepted into the profession. So there may be a question of summative evaluation at the end of the formal educational experiences at the university, which would assist potential employers to make a decision about whether or not to hire a teacher. But then, we might ask the question why such decisions about the competence of a teacher are not made by those concerned and in the context for which they want to hire the individual.

Ken: Teacher evaluation is a critical component of the accountability systems being instituted by school districts and local school boards. Schools want the best teachers for their students and have a right to expect teachers to teach in ways that are appropriate for the students in the context of school and district policies. What we have proposed is a somewhat radical set of ideas that move the locus for evaluation decisions away from a tradition of experts operating from the outside to a more inclusive process that involves insiders engaging in coteaching and associated cogenerative dialogues. Our recommendations do not exclude experts or deny the value of summative evaluation. We want all stakeholders to be involved as insiders because many of the extant contradictions are eliminated in what we propose. Having said that I do not expect that our proposal to use coteaching and cogenerative dialogue will be feasible in all situations that might arise. We are not suggesting a method that is good for all situations.

Michael: The potential problems residing in more traditional evaluation processes are embodied in the following case from my own work as a department head. One of my teachers was put on probation by our school administration that had a history of letting teachers go at any time of the year with little notice. I asked for a chance to work with the teacher, to integrate evaluation and professional development, and to make both part of our

collective responsibility for enhancing the learning of students in our school. The teacher and I planned lessons together, participated in each other's teaching, and discussed what had happened during the shared lessons. By the end of the year, the school administration decided that there had been sufficient growth to warrant a continuation of the teacher's contract. We continued to collaborate over the subsequent two years, and he became a highly competent science teacher. If the administration had fired the teacher as intended, the school would have lost an individual who subsequently showed and realized great learning potential.

Ken: This is a good example of evaluation leading to an appropriate and effective form of professional development. I do envision many situations in which schools and school districts have to make choices of which teachers to hire and or retain. In those situations, in which decisions must be made, there is a possibility that coteaching and cogenerative dialogues as we have described them here, can offer a methodology that might provide data to inform those decisions.

Michael: I also believe that in addition to the kinds of change we can envision, a change to coteaching/cogenerative dialoguing will entail benefits (and also new constraints) that we cannot yet foresee. I would expect, though, that some of these benefits are going to bear similarities with the kinds of change in the industrial workplaces to which I alluded earlier.

Acknowledgments

This research was funded in part by Grant 410-99-0021 from the Social Sciences and Humanities Research Council of Canada and by a Spencer Foundation grant.

References

Anderson, E. (1999). *Code of the street: decency, violence, and the moral life of the inner city*. New York, NY: W.W. Norton.

Bateson, G. (1972). *Steps to an ecology of mind*. New York: Ballantine.

Billig, M. (1994). Repopulating the depopulated pages of social psychology. *Theory & Psychology, 4*, 307-335.

Black, P., & William D. (October, 1998). Inside the black box: raising standards through classroom assessment. *Phi Delta Kappan*, 1-14.

Bourdieu, P. (1990). *The logic of practice*. Cambridge, UK: Polity Press.

Bourdieu, P. (1992). The practice of reflexive sociology (The Paris workshop). In P. Bourdieu & L. J. D. Wacquant, *An invitation to reflexive sociology* (pp. 216-260). Chicago, IL: The University of Chicago Press.

Bourdieu, P. (1997). *Méditations pascaliennes* [Pascalian meditations]. Paris: Seuil.

Cole, R. E. (1991). *Participant observer research: An activist role*. In W. F. Whyte (Ed.), Participatory action research (pp. 159-166). Beverly Hills: Sage.

Colomy, P. (1998). Neofunctionalism and neoinstitutionalism: Human agency and interest in institutional change. *Sociological Forum, 13*, 265-300.

Dewey, J. (1933). *How we think.* Boston: Heath.

Dreier, O. (1991). Client interests and possibilities in psychotherapy. In C. W. Tolman & W. Maiers (eds.), *Critical psychology: Contributions to an historical science of the subject* (pp. 196-211). Cambridge: Cambridge University Press.

Dreier, O. (1993). Re-searching psycholtherapeutic practice. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context* (pp. 105-124). Cambridge: Cambridge University Press.

Eldon, M., & Levin, M. (1991). Cogenerative learning: Bringing participation into action research. In W. F. Whyte (Ed.), *Participative action research* (pp. 127-142). Newbury Park, CA: Sage.

Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit.

Engeström, Y. (1994). *Learning for change: New approach to learning and training in companies*. Geneva: ILO.

Giddens, A. (1984). Structuration theory, empirical research and social critique. In A. Giddens, *The constitution of society: Outline of the theory of structuration* (pp. 281-305). Cambridge, England: Polity Press.

Guba, E., & Lincoln, Y. (1989). *Fourth generation evaluation*. Beverly Hills, CA: Sage.

Holzkamp, K. (1983). *Grundlegung der Psychologie* [Foundations of psychology]. Frankfurt: Campus.

Holzkamp, K. (1984). Zum Verhältnis zwischen gesamtgesellschaftlichem Prozeß und individuellem Lebensprozeß [On the relation between whole-society and individual life process]. *Konsequent, 6,* 29-40.

Holzkamp, K. (1991). Experience of self and scientific objectivity. In C. W. Tolman & W. Maiers (eds), *Critical psychology: Contributions to an historical science of the subject* (pp. 65-80). Cambridge: Cambridge University Press.

Holzkamp, K. (1992). Die Fiktion administrativer Planbarkeit schulischer Lernprozesse [Administrative planning of learning processes at school--A fiction]. In K.-H. Braun & K. Wetzel (Eds.), Lernwidersprüche und pädagogisches Handeln. Marburg: Verlag Arbeit und Gesellschaft.

Lakoff, G., & Johnson, M. (1999). *Philosophy in the flesh: The embodied mind and its challenge to western thought*. New York: Basic Books.

Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge: Cambridge University Press.

Lave, J. (1993). The practice of learning. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context* (pp. 3-32). Cambridge: Cambridge University Press.

Lave, J. (1996). Teaching, as learning, in practice. *Mind, Culture, and Activity, 3,* 149-164.

Leont'ev, A. N. (1978). *Activity, consciousness and personality*. Englewood Cliffs, CA: Prentice Hall.

Markard, M. (1993). Kann es in einer Psychologie vom Standpunkt des Subjekts verallgemeinerbare Aussagen geben? [Can there by generalizations in a subject-centered psychology?] *Forum Kritische Psychologie, 31*, 29–51.

McGonigal, J. (1999). How learning to become a teacher-researcher prepared an educator to do science with elementary grade students. *Research in Science Education, 29*, 5-23.

Mehan, H. (1993). Beneath the skin and between the ears: A case study in the politics of representation. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context* (pp. 241-268). Cambridge, England: Cambridge University Press.

Nissen, M. (1997). *Ideologies and developments in practical dealings with addiction.* Paper presented at the Fourth International Kongress of Critical Psychology, Berlin, Germany. [http://lehmann.psl.ku.dk/~mnissen.lab/krips.htm]

Nissen, M. (1998). Theory and Practice: Happy Marriage or Passionate Love Affair? *Nordiske Udkast, 26,* 79-84.

Pinar, W. F., & Bowers, C. A. (1992). Politics of the curriculum: Origins, controversies, and significance of critical perspectices. *Review of Research in Education, 18,* 163-190.

Ricœur, P. (1991). *From text to action: Essays in hermeneutics, II*. Evanston, IL: Northwestern University Press.

Roth, W.-M. (1998). Teaching and learning as everyday activity. In B. J. Fraser & K. G. Tobin (eds.), *International handbook of science education* (pp. 169-181). Dordrecht, Netherlands: Kluwer Academic Publishing.

Roth, W.-M., Lawless, D., & Tobin, K. (in press). Time to teach: Towards a praxeology of teaching. *Canadian Journal of Education*.

Roth, W-M., & Tobin, K. (in press). Learning to teach science as praxis. *Teaching and Teacher Education.*

Roth, W.-M., Tobin, K., & Ritchie, S. (in press). *Re/constructing elementary science*. New York: Peter Lang.

Tobin, K., Roth, W.-M., & Zimmerman, A. (in press). Learning to teach science in urban schools. *Journal of Research in Science Teaching.*

Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. Harvard *Educational Review, 57*, 1-22.

Tobin, K., Seiler, G., & Walls, E. (1999). Reproduction of social class in the teaching and learning of science in urban high schools. *Research in Science Education, 29,* 171-187.

Table 1

Heuristics for productive cogenerative dialogue sessions

1. **Respect** (Between participants)
2. **Rapport** (Between participants)
3. **Inclusion of stakeholders** (Student teachers, students, school personnel, high school students, university personnel)
4. **Ways to participate**
    1. Coordinating discussion
    2. Listening attentively
    3. Initiating dialogue/ideas
    4. Posing critical questions
    5. Providing evidence
    6. Expressing an opinion (agree/disagree)
    7. Speaking freely
    8. Clarifying and elaborating on ideas
    9. Suggesting alternatives for actions
    10. Evaluating ideas and practices
5. **Opportunities to participate**
    1. Contributing to an equitable playing field
    2. Listening attentively
    3. Making space to participate
    4. Showing willingness to participate
    5. Making invitations to participate
    6. Refusing all forms of oppression
6. **Discussion topics**
    1. Learning to teach
    2. Teaching and learning
    3. Curriculum
    4. Teaching kids like us
    5. Coteaching
    6. Transformative potential of activities/curriculum
    7. Links to particulars
    8. Quality of the learning environment