FQS FORUM: QUALITATIVE SOCIAL RESEARCH SOZIALFORSCHUNG

Volume 5, No. 3, Art. 7
September 2004

Cogenerative Dialoguing and Metaloguing: Reflexivity of Processes and Genres

Wolff-Michael Roth & Kenneth Tobin

Key words: cogenerative dialoguing, metaloguing, interviewing, collective remembering, reflexivity, genres

Abstract: In the course of our collaborative research we had evolved cogenerative dialoguing and metaloguing as forms of doing and writing research. In this contribution, we exemplify these ways of being in the world of qualitative research, drawing on these forms as processes to construct our text and, reflexively, as forms of representing the products of these processes. They therefore also constitute a form of collective remembering in which the voices of participants endure on their own rather than disappearing in the voice of a collective author.

Table of Contents

1. Introduction

Michael: Günter MEY invited me to conduct an interview as part of a special issue he is co-editing, the content of which are interviews with qualitative researchers. I felt that the interview format would be rather limiting and inconsistent with the kind of work we have done together, in particular, how we generated information as part of our research in formats other than the interview, and how we used these other formats as genres in the writing of our research. I am thinking of cogenerative dialoguing and metaloguing. I thought it would be interesting here to exemplify these ways of generating data and writing research. To have a context, we attempt to reconstruct our evolving understanding of cogenerative dialoguing and metaloguing, and show how this constitutes forms of collective remembering and collective theorizing. I propose that we begin by reconstructing our mutual thinking and use the two dialogue forms, then, as an instantiation of metaloguing, reflect on what we have learned at the first level, and finally, at a third level, make another reflexive turn to look at the conversation that we have had so far. [1]

2. Cogenerative Dialoguing: Historical Reconstruction of the Praxis and Name

Ken: When I first came to the University of Pennsylvania I inherited a project that Fred ERICKSON had commenced whereby each student teacher was assigned two students from the urban high school classes in which they were teaching to help them to answer the question "how to better teach students like me." Based on the contingent selection advocated by GUBA and LINCOLN (1989) in Fourth Generation Evaluation, I required student teachers to identify a student from whom they felt they could learn most and then to select as the second student one who is as different from the first as possible. At the end of a lesson the students would meet with the student teacher and others who might have experienced the lesson (e.g., the cooperating teacher, university supervisor, school administrator) to discuss what had happened and how to improve the quality of teaching. [2]

Michael: It is interesting how we ground the origins of some praxis in different ways, that is, how we begin our narratives of a beginning in very different ways. I began this project by rifling through old files to see when I had used the term cogenerative for the first time. I know that at some point in time, I read a chapter on participatory action research (ELDON & LEVIN 1991). It was there that I had read the term "cogenerative dialogue" for the first time. However, when I began using the term later, it was somehow linked to the work we were doing in the context of coteaching. After teaching lessons together with elementary school teachers, I sat down with them to debrief. At some point, I began to talk and write about coteaching. Searching for a term describing debriefing (which always occurred in a collegial way) accompanying the practice of coteaching, encompassing the collective and generative nature of theorizing praxis together, the term "cogenerative" must have emerged at some time. I vaguely recall that I had tossed around the term "praxeology" to denote theory about practice generated by practitioners (e.g., ROTH, LAWLESS & TOBIN 2000b). But I did not want these praxeology sessions to be asymmetrical with respect to whose descriptions and explanations were valued. If the practitioner knows praxis best, researchers have to participate in praxis; praxeology then requires the input of all participants otherwise it will fail to account for how they experience praxis. [3]

Ken: In my situation, too, the use of the term emerged in the context of coteaching. Within a year of my arrival at Penn, we decided to enact a coteaching model in which one or more student teachers taught urban classes together, sometimes with a coop teacher, a university supervisor or researcher, or a school administrator. After such lessons the conversations involved the coteachers and the students and there was a tendency to regard the students as the experts and to listen carefully to their advice and act on it. [4]

Michael: I remember that you wrote to me how you created panels of students to whom the new teachers could address questions. The motto was something like, "How do you teach kids like me?" [5]

Ken: After a year the idea of cogenerative dialogue emerged when our research in urban science classes occurred in the same schools as the two in which Penn assigned all of its student teachers. As a researcher you joined the regularly scheduled after class discussion and applied a theoretical lens of activity theory to our practices. In response to my asking Andrea ZIMMERMANN why she had permitted a transition between activities to be so long you retorted: "If it was so long why didn't you shorten it?" It was at that moment that I realized the centrality of collective responsibility for the coteaching and also for the outcomes of discussion in the cogenerative dialogues. From that moment on we have fine tuned the goals and roles of participants in cogenerative dialogues to emphasize the cogeneration of collective agreements on what is happening, contradictions that occur, and ways in which the contradictions can be removed—either by eliminating them or increasing their occurrence. Once this was done we realized many different possible outcomes from cogenerative dialogues and expanded the range of applications of cogenerative dialogue so that they could occur within lessons, immediately after lessons, and could actually include whole classes or small subsets of the participants in a class. [6]

Michael: I remember the incident clearly, because we reflected a lot on the experience in Andrea's classroom and even wrote several articles involving different stakeholders such as Andrea, one of her students, and her cooperating teacher (ROTH, TOBIN, ZIMMERMANN, BRYANT & DAVIS 2002). Although I thought that our use of the term predated our coteaching experience with Andrea, a search through my files didn't substantiate this idea. [7]

Ken: You are right. Following a visit to your research group in Canada we began to write about praxeology and when I returned to Penn we used that term to describe the group discussions over practice. Later, when you were again at Penn you introduced me to the term cogenerative dialogue and for a while we used both terms in our descriptions of coteaching. Over time cogenerative dialogue was preferred and we rarely use praxeology these days. [8]

Michael: The earliest mention dates back to the files related to an article that we published in *FQS* (ROTH, LAWLESS & TOBIN 2000a). That piece actually carried the name for our method in its title. But pertaining to the incident, I made the comment and then felt bad because it could easily be heard (interpreted) as a snide remark. Yet I also felt that if coteaching was to be symmetric, that is, if we had committed to concretely realize a collective responsibility for the learning of the students through our individual actions, we needed to act when we saw that something didn't work and talk about the incident later.[1] Then, of course, once we reified our practice through the denotation of cogenerative dialoguing, there was a need to theorize this practice itself. [9]

Ken: The use of theory to make sense of cogenerative dialogues enabled us to iteratively consider an expanded array of potential outcomes and to explore

1 According to scholars such as BAKHTIN (1993) and RICŒUR (1990), each human act implies a responsibility for its effect on others. With respect to speech, the effect an utterance has on others is denoted by the term "perlocutionary force" (AUSTIN 1962/1975).

relationships between individuals in relation to the collective and the manner in which agency | structure relationships unfolded. Initially the changes were minimal. For example, we had observed that huddles occurred routinely as a part of coteaching, that is, teachers got together during the lesson to have a brief exchange about what to do next. Now we recognized these as a form of cogenerative dialogue that occurred within a science lesson. Initially these had involved coteachers, but now we were able to see the wisdom of convening cogenerative dialogues within lessons and expanding the number and types of participant. At first our extensions were to the idea of huddles and there was an increased incidence of huddles that occurred for short periods of time, usually while students were involved in small group or individualized tasks. Huddles were usually short and typically, though not always, did not involve students. However, a new form of cogenerative dialogue that did involve students occurred within class time and took the place of the regular curriculum. [10]

Michael: In a sense, you pushed the idea of cogenerative dialoguing to make a version of it part of the coteaching praxis itself. The idea then was to no longer wait for talking about what to do next, but to get together when there was a need to make sense of what was going on and what ought to happen next right then and there. In this sense, then, this form of cogenerative dialoguing is a collective version of what educators have come to know as "reflection in practice" (SCHÖN 1987), though it would have been better to denote reflection on practice because all reflection requires a removal from praxis itself (ROTH, LAWLESS & MASCIOTRA 2001). But then in our work, we extended cogenerative dialoguing from involving teachers and a small number of student representatives (usually two or three), to involving the teachers and the entire class. [11]

Ken: Whole class cogenerative dialogues began as an extension of the more traditional form in which two student researchers met with coteachers to identify and resolve contradictions and cogenerate new rules, roles and resolutions. We decided that the two students could bring the cogenerative dialogue to the whole class, using a computer and projector to present video vignettes that showed the contradictions and then to allow whole class discussion that would allow all participants to consider what the small group had considered and decided. The whole class dialogues then became a place for collective decisions to emerge within a context in which respectful interactions could occur, with the understanding that no voice would be privileged and it was safe to make critical statements about others as long as the interactions were respectful and free of malicious intent; the goal being to improve the quality of science education. [12]

Michael: So cogenerative dialoguing really has become a praxis of method in a triple sense. First, it constitutes a concrete situation in which to generate theory as part of research. Second, it constitutes an alternative to interviewing teachers about their experiences; that is, we generated data first by coteaching and then together by discursively evolving understandings of what happened. Third, and perhaps most importantly, it has became a means for all stakeholders in a situation to deal with contradiction and conflict and to design changes themselves rather than waiting for policies and recommendations from researchers. [13]

Ken: Yes, and the results were promising and comments from throughout the schools in which we tried whole class cogenerative dialogues and home suggest that students were creating forms of culture that could subsequently be transferred to other fields. The conscious realization that cogenerative dialogue was a field in the sense of BOURDIEU and WACQUANT (1992) drew our attention to agency. We had evidence that culture being produced in cogenerative dialogues was enacted in other fields that included the science education curriculum, other subject areas, the hallways and lunchroom, and at home. That is, cogenerative dialogues were regarded as sites for cultural production that could then be enacted in a variety of other fields. This realization led us to focus on our earlier decision to populate cogenerative dialogues with participants who were different from one another. Perhaps there were more important reasons for urban schools to employ cogenerative dialogues; for participants to learn how to successfully interact with others across the boundaries of age, gender, ethnicity, and class. For example, the small group cogenerative dialogue was a relatively safe field in which students could learn to interact successfully with other students, adult teachers, and adults from different social classes. The converse was also the case, for example, when a middle class, White female teacher had opportunities to successfully interact and show respect for the practices of poor, Black youth. Having built culture around successful interactions in small group cogenerative dialogues the opportunities were then there for this culture to be enacted in different fields, for example, in the science classroom, throughout the school and in the streets. Hence, we have learned to regard co-generative dialogues as fields in which culture is produced, transformed, and reproduced, thereby increasing the likelihood that practices in other fields can be socially and culturally adaptive. [14]

3. From Cogenerative Dialogues to Metalogues

Michael: Cogenerative dialogues have been an important context for making sense of the events in urban high schools not only for bringing about change but also as a method for generating data and interpretations on which subsequent publications in very different communities of practices were based. Because we wanted to be consistent with our understanding of theory generation as a collective process that did not privilege any one voice, there were consequences to the way in which we wrote research. Metalogues, a term first that was introduced and used, to the best to of my knowledge, by Gregory BATESON (1972), became to us an important genre for many reasons. It preserved the voices of individual authors, high school students and teachers alike; it was a way of "ratcheting up," that is, a way of moving from data presentation and description to theory; and it was a way of introducing reflexivity into our research—its written product took the form of the process. [15]

Ken: As well as moving from experience to theory about experience metalogue allows moves to policy, practice, and research concerns. Hence, based on what was learned in a study, the authors can explore different realms of applicability for them. The power of metalogue is that each author can present his or her own perspectives and there is no obligation for co-authors to sign on and agree. In

this way the unfolding text, as a form of culture can have its coherences and contradictions and readers can anticipate learning from all of what is written. It is important to show multi-authored texts in an authentic way that benefits from the diversity among authors. Unfolding text is a structure, not only for readers, but also for authors, and metalogue and voiceover are ways for authors to be agentic with respect to this dynamic structure. For example, it is an opportunity to interpret interpretations and thereby learn more about oneself and the other authors and it is also a way to look at the practices in other fields, such as teaching and learning science in other schools, formulating policy at local, district, state and national levels, and doing research in the future. [16]

Michael: For me, this reflexive nature of the metalogue was always very important: it is not just a genre for preserving voice and presenting multiple perspectives on some issue that we have experienced in different ways. Rather, at the level of writing research, it reflected the same kinds of processes that we were part of in the field. And then, it became reflexive of learning at the writing stage, when we learned again from our previous learning. [17]

Ken: My use of metalogue stemmed from a long history of co-authoring texts with participants. It always bothered me that co-authored pieces tended to reflect the most powerful voices on the team, usually mine. Although we worked hard to reach consensus usually I persuaded my coauthors to a different point of view. In a study involving Gale SEILER, who was a doctoral student at the time and MacKenzie (Mac) SMITH, who was a student teacher in a master's degree program at my university, we wanted to write a paper that addressed the challenges of teaching science methods courses that prepared teachers for their student teaching assignments in urban high schools and thereafter for careers as high school science teachers (TOBIN, SEILER & SMITH 1999). Mac was critical of the course I was responsible for; so we decided to use metalogue as a way to preserve the voices of the three different researchers and bring into contrast the areas of agreement and disagreement. [18]

Michael: Interestingly enough, for me, too, the metalogues—as the cogenerative dialogues—arose from a concern for the voice of participants. In 1992, I was still a high school teacher when I wanted to do a study on students' epistemology and talk about the nature of science. As I was doing the interviews, one of the students, Todd ALEXANDER, asked me whether he could work with me, collect data, and write. While working on the text, it became clear to me that we had to preserve our respective voices, and so we experimented with personal voices within stretches of collective voice (ROTH & ALEXANDER 1997). Later on, I worked on articles reviewing the literature in the social studies of science, and argued for the use of different genres in science education. Reading books such as Mind and Nature (BATESON 1980), Angels Fear (BATESON & BATESON 1987), or Three Dialogues on Knowledge (FEYERABEND 1991), in each of which dialogue was used as a genre, also inspired me. A key publication for me was an article entirely written in dialogue form entitled "Four dialogues and metalogues about the nature of science" (ROTH, McROBBIE & LUCAS 1998). Initially, there are two levels of conversation: at one level, four high school students talk about

the nature of science; at the other level, a researcher and a journalist talk about the students' conversation, sometimes even talking to the students. When we drew conclusions, we ratcheted up within the conversation to look at what we had learned in the study, which therefore constituted another level. For me, this publication was central for its reflexive nature: it argued that scientific knowledge was discursively constituted and did so in a discursive way. Then, of course, you and I began to work together more closely when you moved to Philadelphia, and when we worked at City High School, where we had similar concerns. [19]

Ken: At the time you and I were in regular e-mail contact and I knew of your concern for voicing and privilege and I was impressed by the potential of conversations among participants—to reflect different perspectives. Several years before I was an external examiner on a doctoral thesis written by Mark WILLIAMS in which he had created a dream sequence in which three philosophers participated with him about his research, social theory and the salience of dreams (WILLIAMS 2000). The effectiveness of these dialogues in juxtaposing contrasting points of view struck me and it was only a matter of time before we began to use metalogue as a regular feature of our research. In a study of urban science teaching, in which I was the teacher, Edward WALLS an African American student researcher and Gale SEILER a participant observer who undertook research in my class, we once again used metalogue to represent our very different positioning as educators and scholars (TOBIN, SEILER & WALLS 1999). [20]

Michael: I think it was also at the time that Jacques DÉSAUTELS began criticizing us for not implementing metalogues in the spirit of its inventor Gregory BATESON. This ultimately led me to use the expression "ratcheting it up," meaning that metalogues are not just dialogues but moments of second- and third-order learning, that is, instances of learning about learning. So we began using metalogues to go back over terrain that we had covered, seeing what we have learned and attempting to learn from our own learning processes. [21]

Ken: In this way, you and I have used metalogue effectively in numerous articles and books (e.g., ROTH & TOBIN 2002). Our approach has been somewhat the same each time we have participated in metalogue, whether we are seated in the same room in Philadelphia or Victoria or interacting on e-mail. Having identified a topic, one of us usually identifies up to three issues considered to be salient and writes up to three paragraphs about each of those issues. The other then joins the conversation, addressing each of the paragraphs by inserting text after them or breaking paragraphs to insert relevant dialogue. Over successive sweeps from one participant to the other, the depth of the interaction can be increased and we ratchet up from descriptive analysis to increasingly theoretical discussions about the emergent constructs that we have addressed. In our case the different perspectives tend to be complementary and reflect our different programs of research. In other cases, such as the edited book with Peter TAYLOR and Penny GILMER the different perspectives may have addressed somewhat different issues, thereby giving the metalogues a broader scope than would otherwise have been the case. For example, as a chemist, GILMER's perspective often

reflected that of a scientist who is now focusing on education, TAYLOR tended to reflect his tradition of research using narrative, and I brought a perspective of a science teacher educator with recent experience in urban schools (TAYLOR, GILMER & TOBIN 2002). [22]

Michael: With the metalogues, we really blurred the boundaries that some people experience between doing research and analyzing data and writing the research studies. Doing (writing) a metalogue is part of the data analyses, it is another pass over the data but now concerning our own learning in the process of doing the study. However, we often engage in this only after having produced some text intended for publication. So in a sense we begin working with the data again not only to write the research but also to engage in further learning. [23]

Ken: I find metalogue to be an ideal methodology for edited volumes, allowing the editors to engage in interactive dialogues that add significantly to the text of a chapter, allowing the editors to add their perspectives and also to connect to other works in the same volume. [24]

4. Collective Remembering

Michael: Cogenerative dialoguing includes a form of collective remembering in the sense that different participants in a teaching/learning situation get together to describe and explain events in which they have participated. In a sense, then, this text reflects the processes that it is about, including the aspect of "collective remembering." I find this concept interesting, because it suggests that memory is best understood as accomplishments that occur in the course of communicative action (e.g., MIDDLETON & EDWARDS 1990). Memory is thereby something that speakers perform in interaction rather than simply possess. As performances, memory is based on cultural understandings of what is to be counted as adequate. From this perspective, remembering is a social act, a way of doing something in the present by invoking the past in an appropriate and skilled manner. [25]

Ken: By articulating remembered events they become schema that can then coexist with practices when collective (i.e., cogenerated) agreements about changes in roles and rules are enacted in the classroom. For me it is salient to reconstruct memories across the boundaries of age, class, ethnicity, and gender so that new socially constructed schema incorporate diverse perspectives and thereby can structure practices in ways that are culturally adaptive. [26]

Michael: What you are saying made me think of the ways of our normal ways of being in the world, which, to a large extent is unreflective (HEIDEGGER 1977)—being in the world would be almost impossible if we had to consciously track everything that is going on. However, engaging in cogenerative dialogue constitutes a form of collective remembering, that is, a way of becoming aware that life not only could have been otherwise but also for the other, whoever it is, was otherwise. [27]

Ken: Cogenerative dialogues also can be thought of as a critical component of Ann BROWN's (1992) design experiment, in which an experimental design is changed, even while it is being executed, for the purpose of providing the best education possible. What is unique about cogenerative dialogue as a curriculum evaluation and improvement tool is that the responsibility for improving a curriculum and enacting it successfully is collectively assumed and when the curriculum is enacted the students "have the back" of the teacher and vice versa. Accordingly, following each cogenerative dialogue agreed upon changes are enacted and the extent to which the curriculum, as enacted, produces successful learning outcomes is reviewed in regular cogenerative dialogues. As I see it, the infusion of cogenerative dialogues into design experiments increases the potential of design experiments to catalyze and sustain curricular improvements. [28]

Michael: Looking back over our conversation, I notice the different ways in which cogenerative dialoguing and metaloguing were grounded in our respective experiences. I, for one, thought before we began working on the present piece that for you both forms were linked to our collaboration. I had not thought about the possibility that cogenerative dialoguing and metaloguing became salient in a different way, grounded in your own experience. [29]

Ken: It is always difficult and perhaps impossible to say for sure what caused what in any social trajectory. I am sure there is no one starting out place. My recollections, as I have laid them out here are just one of many renderings I could give to a narrative about the origins of both cogenerative dialogues and metalogue. In our case we have continuously interacted, often via e-mail, for a long time now, a time that predates our uses of cogenerative dialogues and metalogues. I would be astonished if there were no mentions of both of these in our oral and written exchanges long before I came to the University of Pennsylvania. So, probably your recollections are correct as well. I do not think there is just one starting out point for any social trajectory and it surely is the case that much of social life occurs at a level that is beyond conscious awareness. I am aware that for at least six years we have continuously pushed the envelope on both of these practices and their current forms carry the stamp of serious intellectual work and collaboration of you, me and many of our associates. [30]

Michael: The point of collective remembering, of course, is not just that of remembering together. Rather, what is interesting from the perspective of collective remembering are the kinds of things we make account for and salient for one another and the ways in which we do it. [31]

Ken: I see the power in what you describe as collective remembering as a way to create socially inscribed schema that dialectically coexist with practices to be enacted in social life, including classrooms, where teaching and learning can be structured by those collective remembrances and what participants, based on these socially constructed memories, agreed to do and assume responsibility for. [32]

5. Coda

Michael: As I was looking back at what we have said so far, my first fleeting thought concerned the dialogic nature of our research and writing praxis, that is, cogenerative dialogue and metalogue not only as methods and genres but as forms to live what we are doing. In this way, I do not experience cogenerative dialoguing and metaloguing as implementing something that Gregory BATESON or Mikhail BAKHTIN articulated and described. Rather, cogenerative dialoguing and metaloguing are labels used to index ways of being in the world. The second thought concerned a moment in our joint writing experience in your Philadelphia home. I remembered that we had written a dialectical postscript about the Janus-faced nature of the book's ending and therefore went to look for it. Searching for this ending, I found out that I was wrong about the particular book in which this ending had occurred. While I had the resources to find this out by myself, this contribution shows that there are many instances in life where it is just as important to engage in remembering collectively. In fact, all remembering is collective, even my own private search, because of its inherently social nature in which I account for it and the contradictions I experienced. [33]

Ken: Talking and writing together over shared experiences affords the cogeneration of memories that are in fact transformed and part of a dynamic structure of the field (i.e., cogenerative dialogue or metalogue). As you have stated it is a powerful way to learn by re-viewing what has been learned. What is most powerful to me is that what has been learned is then available as a resource for action, hence agency, in the lifeworlds of the participants. Whereas the roots of what we do are grounded in the intellectual work of BATESON and BAKHTIN, the subsequent trajectories of use are shaped by our goals and values. Now cogenerative dialogue and metalogue are fields that we have appropriated as sites for critical parts of our professional practices as researchers, teacher educators, and curriculum developers. [34]

Michael: Ultimately, I think that the experience of writing this piece has shown to me once again that cogenerative dialoguing and metaloguing are viable alternatives to interviewing, which are of interest because they do not a priori attribute to participants different kinds of roles and the intellectual and historical baggage (opportunities, constraints) that come with them. This article, therefore, is raising an interesting tension and perhaps contradiction with respect to Günter MEY's initial invitation to conduct an interview with a prominent qualitative researcher. [35]

References

Austin, John L. (1962/1975). *How to do things with words* (2nd edition). Cambridge, MA: Harvard University Press.

Bakhtin, Mikhail M. (1993). *Toward a philosophy of the act*. Austin: University of Texas Press.

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

Bateson, Gregory (1980). *Mind and nature: A necessary unity*. Toronto: Bantam Books.

Bateson, Gregory & Bateson, Mary Catherine (1987). *Angels fear: Towards an epistemology of the sacred*. Toronto: Bantam Books.

Bourdieu, Pierre & Wacquant, Loic J. D. (1992). *An invitation to reflexive sociology*. Chicago: University of Chicago Press.

Brown, Ann (1992). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *Journal of the Learning Sciences, 2*, 141-178.

Eldon, Max & Levin, Morten (1991). Co-generative learning: Bringing participation into action research. In William Foote Whyte (Ed.), *Participatory action research* (pp.127-142). Newbury Park, CA: Sage.

Feyerabend, Paul K. (1991). *Three dialogues on knowledge*. Oxford, UK: Basil Blackwell.

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

Heidegger, Martin (1977). *Sein und Zeit*. Tübingen [Germany]: Max Niemeyer.

Middleton, David & Edwards, David (Eds.) (1990). *Collective remembering*. London: Sage.

Ricœur, Paul (1990). *Soi-même comme un autre*. Paris: Seuil.

Roth, Wolff-Michael & Alexander, Todd (1997). The interaction of students' scientific and religious discourses: Two case studies. *International Journal of Science Education, 19*, 125-146.

Roth, Wolff-Michael & Tobin, Kenneth (2002). *At the elbows of another: Learning to teach through coteaching*. New York: Peter Lang.

Roth, Wolff-Michael; Lawless, Daniel & Masciotra, Domenico (2001). Spielraum and teaching. *Curriculum Inquiry, 31,* 183-207.

Roth, Wolff-Michael; Lawless, Daniel & Tobin, Kenneth (2000a, December). {Coteaching | Cogenerative Dialoguing} as Praxis of Dialectic Method [47 paragraphs]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* [On-line Journal], *1*(3), Art. 37. Available at: http://www.qualitative-research.net/fqs-texte/3-00/3-00rothetal-e.htm [Accessed February 1, 2004].

Roth, Wolff-Michael; Lawless, Daniel & Tobin, Kenneth (2000b). Time to teach: Towards a praxeology of teaching. *Canadian Journal of Education, 25*, 1-15.

Roth, Wolff-Michael; McRobbie, Cam & Lucas, Keith B. (1998). Four dialogues and metalogues about the nature of science. *Research in Science Education, 28*, 107-118.

Roth, Wolff-Michael; Tobin, Kenneth; Zimmermann, Andrea; Bryant, Natasia & Davis, Charles (2002). Lessons on/from the dihybrid cross: An activity theoretical study of learning in coteaching. *Journal of Research in Science Teaching, 39*, 253-282.

Schön, Donald A. (1987). *Educating the reflective practitioner*. San Francisco: Jossey-Bass.

Taylor, Peter C.; Gilmer, Penelope & Tobin, Kenneth (Eds.) (2002). *Transforming undergraduate science teaching: Social constructivist perspectives*. New York: Peter Lang.

Tobin, Kenneth; Seiler, Gale & Smith, Mackenzie W. (1999). Educating science teachers for the sociocultural diversity of urban schools. *Research in Science Education, 29*, 68-88.

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

Williams, Mark Campbell (2000). Pictures, dreams, and the reflexive educational reformer. Networks: *An On-line Journal for Teacher Research, 3*(12). Available at: http://www.oise.utoronto.ca/~ctd/networks/journal/Vol%203(1).2000april/Article5.html [Accessed February 1, 2004].

Authors

Wolff-Michael ROTH is Lansdowne Professor of applied cognitive science at the University of Victoria. His interdisciplinary research agenda includes studies in science and mathematics education, general education, applied cognitive science, sociology of science, and linguistics (pragmatics). His recent publications include At the Elbows of Another: Learning to Teach by Coteaching (with K. TOBIN, Peter Lang, 2002), Science Education as/for Sociopolitical Action (ed. with J. DÉSAUTELS, Peter Lang, 2002), Being and Becoming in the Classroom (Ablex Publishing, 2002), and Toward an Anthropology of Graphing (Kluwer, 2003).

Contact:

Wolff-Michael Roth

Lansdowne Professor
MacLaurin Building A548
University of Victoria, BC, V8W 3N4
Canada

Phone: 1-250-721-7785

E-mail: mroth@uvic.ca

Kenneth TOBIN is Professor of Urban Education at The Graduate Center of City University of New York. His research interests focus on the teaching and learning of science in urban schools, which involve mainly African American students living in conditions of poverty. A parallel program of research focuses on coteaching and cogenerative dialogues as ways of learning to teach in urban high schools and increasing the transformative potential of science education. The methodologies he employs include practices that cohere with theories from cultural sociology, the sociology of emotions and activity theory. His approach, which is largely critical ethnography, is augmented with micro-analyses that involve intensive research using videotapes.

Contact:

Kenneth Tobin

Professor, Urban Education
The Graduate Center
The City University of New York, NY
10016-4309
USA

Phone: 1-212-817-8284

E-mail: ktobin@gc.cuny.edu

Citation

Roth, Wolff-Michael & Tobin, Kenneth (2004). Cogenerative Dialoguing and Metaloguing: Reflexivity of Processes and Genres [35 paragraphs]. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *5*(3), Art. 7, http://nbn-resolving.de/urn:nbn:de:0114-fqs040370.