

Manuscript prepared for submission to

*Mind, Culture, and Activity*

**Redesigning an 'Urban' Teacher Education Program:  
An Activity Theory Perspective**

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FileName: Expansive learning 1.10 SaveDate: June 20, 2000 PrintDate: 6/20/00 9:58

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# **Redesigning an 'Urban' Teacher Education Program: An Activity Theory Perspective**

## **Abstract**

In this article, we use activity theory to frame the redesign of an urban teacher education program. Some of the contradictions that we had to deal with are endemic to traditional teacher education programs while others were particular to this program that has as its goal to prepare teachers to work in urban (inner city) schools. As a result of our intervention, the implementation of coteaching, the teacher education program became participatory and more democratic. Coteaching makes salient the social, collective, rather than individual, psychological dimensions of learning to teach. As a result of the redesign process, new forms of relations between preservice teachers and cooperative teachers and supervisors emerged that are more participatory and democratic than they had been in the past.

Teacher education is fraught with problems. Despite nearly a century of research since Dewey began to work towards a professionalization of teachers and teaching, there remains a fundamental gap between theory and praxis. In our research beginning and experienced teachers alike tell us time and again that what they learn in their university courses or during summer workshops for teacher enhancement has little to do with teaching praxis (e.g., Roth, 1998a; Roth, Masciotra, & Boyd, 1999; Tobin, Seiler, & Smith, 1999). It is true that teacher education programs include field experiences, which allow ‘future’ teachers to spend some time in a school. Teachers in training also teach some lessons. However, as the following comments show, tremendous difficulties of teaching and learning to teach can be encountered particularly by those teacher trainees who undertake their field experiences in urban schools that serve students from housing projects, poverty, and crime infested neighborhoods.

Today was by far the worst day of my short teaching career. I’m hoping that the weapons check had something to do with it, but I’m not quite so sure about that. My class started on time but nothing was accomplished. I tried to introduce the lab, move the desks, get them into groups, and get them started on the lab. But no one would go with me. I had probably 5 or 6 kids out of the 25 in the class actually interested in doing what I wanted them to do. They were unruly. Totally disrespectful, loud and obnoxious!

How do I get them to want to perform for me? Everyone says rapport, rapport, rapport and I understand it is important. But right now, the rapport that I am establishing is not the rapport between teacher and student BECAUSE I am not their teacher nor do I feel that I am qualified to be. Does anyone else feel this way?  
(Cam, teaching intern, 11/04/98)

In these reflections of a teacher-to-be on a day at school, we recognize a lot of frustrations. In these and other reflections (e.g., Roth & Tobin, 2000), Cam articulates a number of possible causes for these frustrations. These causes include: (a) the differences

between the way these inner city students behave compared to students in the middle class school that he had attended, (b) pedagogies that do not work, (c) university lessons on ‘building rapport’ that do not work in praxis, and (d) a general lack of relevance of university training to the work in schools. We know that these problems are not singular but are experienced by new teachers in other parts of the continent, even when working in less challenging schools (Roth & Boyd, 1999). Some problems described by Cam and his peers clearly have to do with the gap between theory and praxis and are therefore endemic to traditional teacher education programs. Other problems are specific to a teacher education program that intends to prepare teachers for working in urban schools.

Despite the persistence of the problems in teacher education, there is a lack of research that attempts to understand the situation in non-monocausal ways and to enact practices that lead to positive change. Furthermore, the traditional focus on the individual, psychological, rather than the social, collective dimensions of learning to teach tend to blame individual teachers. In this article, we describe and theorize one teacher education program before and after its change, which was to address the contradictions that existed in the way it intended to prepare the next generation of teachers. In our work, we follow the suggestion that only a rethinking of problems and contradictions (here in teaching) in terms of their collective societal rather than individualistic dimensions will make a difference in the way society is re/produced (Lave, 1996; Tolman, 1994).

Because of the complexity of the problem, we sought an analytic tool that allowed us to address two concerns. First, the analytic tool should afford us to track multiple relations between individuals and institutions, and artifacts and rules that mediate relations between them. Second, the tool needed to be commensurable with our epistemology of praxis that appeared to us an essential commitment for overcoming the problems in the theory-praxis relation (e.g., Dreier, 1993; Holzkamp, 1991).

Conscious of a fundamental contradiction in teaching—the chasm between educational theory that is inculcated to prospective teachers in university lectures and educational praxis

that constitutes teachers' day-to-day experience on the job—our recent work has focused on developing an 'understanding-from-praxis' approach (Roth, Masciotra, & Boyd, 1999; Roth, Lawless, & Masciotra, in press; Roth, Lawless, & Tobin, in press; Roth & Tobin, in press). Our work is grounded in (sociological) phenomenology (e.g., Bourdieu, 1997) and critical psychology (e.g., Dreier, 1991), which has encouraged us to take account for the salient elements in our actors' lifeworlds. The latter are characterized both by local contingency and structural hierarchical relations that make up objectively experienced social worlds, which, in the form of specific activity systems, evolve historically and reproduce themselves constantly (e.g., Bourdieu & Passeron, 1979). Because activity theory focuses on the complex, situated and distributed nature of ongoing activity it provides us with a lens that is consistent with our epistemological commitments to praxis (Cole & Engeström, 1993). Two studies in educational contexts, dealing with problems in an inner city school in Finland (Y. Engeström & R. Engeström, 2000) and school-workplace transitions (Williams, Wake, & Boreham, 2000), suggested to us the potential usefulness of activity theory in our situation.

### Activity Theory

Activity theory—'the best kept secret of academia' (Engeström, 1993, p. 64)—has its origin in Russian psychology that intended to integrate the traditional divide between individual and society (e.g., Leont'ev, 1981). Engeström (1987) articulated a diagrammatic representation of activity theory, which we depict in terms of our context of teaching in Figure 1. In the model, the *subject* refers to the individual or sub-group whose agency is chosen as the point of view in the analysis. The *object* refers to the 'raw material' or 'problem space' at which the activity is directed and which is molded and transformed into *outcomes* with the help of physical and symbolic, external and internal mediating

*instruments*, including both tools and signs.<sup>1</sup> The teacher is the subject, his/her primary object in the activity of teaching being current ( $t = t_0$ ) student knowledge that, as a result of the activity, is to be transformed into student knowledge at some future time point ( $t = t_1$ ). In this effort, he/she has available a range of tools. However, this activity is embedded in a range of relations with other entities such as the rules that mediate the relation between two pairs of entities, the community that situates the activity in social ways, and the division of labor concerning the activity. The *community* consists of multiple individuals or sub-groups who share the same general object (e.g., students and teachers in the same small learning community or school). The *division of labor* refers to both the horizontal division of tasks between members (e.g., two teachers coteaching a class, two teachers in a small learning community) and to the vertical division of power and status (e.g., the relation between a teacher and her principal). Finally the *rules* refer to the explicit and implicit regulations, norms and conventions that constrain actions and interactions within the activity system.

Activity systems are not stable but, with their constitutive entities and relations, undergo continuous change; that is, activity systems are inherently historical. A crucial, Marxist insight was that the changes are driven by contradictions within and between activity systems (Il'enkov, 1977). In fact, the study of contradictions allows us to avoid dualism and subjectivism. Contradictions are developmentally significant and exist in the form of resistance to achieving the goals of the intended activity and as emerging dilemmas, disturbances, and discoordinations (Engeström, 1999). Engeström identifies four different types of contradictions. Primary or inner contradictions are located *within* each constituent

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<sup>1</sup> We do not intend to set up a binary opposition between subjects and objects. First, the English 'object' should be read as the German 'Gegenstand' (as in object of inquiry) rather than as 'Objekt' (as in material object) (Leont'ev, 1978). Second, with Bourdieu (1997), Holzkamp (1983), and Ricoeur (1992) we believe that it is because of our material bodies that we also become social bodies. That is, the material nature of human subject is a precondition for their sociality. Third, there are social and material qualities not only to human subjects, but, as social studies of science has shown, also to objects, tools, and artifacts (e.g., Latour, 1993).

component of the central activity (e.g., when intended object, student learning, has been substituted by ‘doing fun [activities]’). Secondary contradictions exist between the constituents of the central activity (e.g., when the language [tool] used to teach is in conflict with the students’ primary language [object]). Tertiary contradictions arise from the differences between the object/ motive of the dominant form of the central activity and the object/ motive of a culturally more advanced form of the central activity (e.g., learning in school science versus scientific laboratory). Quaternary contradictions between a constitutive component of the central activity and a component-producing neighbor activity (e.g., a teacher, as the object of research on teaching feels like a ‘lab rat’ or ‘guinea pig.’).

Activity theory has been used successfully to analyze successes, failures, and contradictions in complex situations without reductionist simplifications (e.g., Engeström, 1997). For example, Engeström and Escalante (1996) described the rise and ultimate fall of a technological and commercial innovation, the electronic kiosk ‘Postal Buddy’. They were able to show that, despite a successful development of the Postal Buddy and successful garnering of global control over its distribution, the innovation failed because Postal Buddy was not inserted in the local activity systems of the post office. In another example, Miettinen (1998) used activity theory to describe and explain the transformation of cellulase research in the biotechnical laboratory of the Technical Research Center of Finland. Activity theory allowed Miettinen to avoid a monocausal model by tracking the constant changes of the research object as a function of the changing industrial and social changes, knowledge of new research results, and the emergence of new technologies and associated material objects.

### Context of Research and Development

The teacher education program at the University of Pennsylvania (Penn) constitutes the context of the work reported here. (All proper names except Penn, Tobin, and Roth are pseudonyms.) In 1997, Tobin was appointed Director of Teacher Education. It was under

his tenure that the context for teacher education, particularly that for science teacher education was changed. We are now in our third year of conducting ethnographic research in accompanying the changes in the teacher education program at Penn and associated public schools. 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 further described below). Our current research method is therefore better classified as 'participatory action research' (e.g., Eldon & Levin, 1991), particularly those forms that pair research and activism (e.g., Cole, 1991; Jasanoff, 1996) and therefore are inherently partial to the lot of the people (e.g., Maiers & Markard, 1987).<sup>2</sup> Tobin, both as a professor in teacher education at Penn and as a coteacher at City High School is a participant who engages in research to participate in transforming the different lifeworlds that he shares with students, teachers, student teachers, and colleagues. A significant goal of his work is to catalyze changes in the extent to which communities such as the school and university support learning and improvement.

Most of our research was conducted at City High School in urban Philadelphia. This high school is attended by more than 2,000 students mainly from African American, poverty-stricken or working class families. 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 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 permitted urban schools to be funded at a level far below that of suburban schools. In a striking contrast the students place the blame for the inadequate curriculum squarely with teachers and administrators who maintained a

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<sup>2</sup> In 1996, *Social Studies of Science* published a special issue, 26(2), in which authors debated the relative merits of neutrality and commitment, politics and policy, and research and activism.

curriculum perceived by many students to be a complete waste of their time. Since January of 1999, Tobin has taught in the school on a regular basis. Roth cotaught with Tobin, resident teachers, and new teachers at CHS as part of a research stay.

As part of our research, we draw on a variety of qualitative research methods appropriate in school contexts, including ethnography, discourse analysis, micro-analytic approaches to studying situated cognition. In addition to the usual observational, methodological, and theoretical fieldnotes we videotape lessons, interview students and (student) teachers, audio-tape interviews conducted by high school student research assistants among their peers, and collect the teaching-related discussions preservice teachers held using an online internet forum. We also videotape ‘cogenerative dialogue sessions’ (described below) in which those who participated in a lesson talk about teaching and learning in order to generate understanding—which we call ‘praxeology’, from talk (Gr. *logos*) about praxis (Roth, Lawless, & Tobin, in press)—by critically examining their praxis.

We make sense of our data by analyzing data independently, followed by subsequent negotiation of meanings, or by analyzing data collectively. We begin our initial analyses in the sessions with teachers and students who shared our experience in the classroom. We use the techniques of peer debriefing (relationship with independent colleagues without interest in the local situation), monitoring progressive subjectivity (emergent collective descriptions), and member checking (validation of situation descriptions by research participants) for ascertaining the credibility of our research findings (Guba & Lincoln, 1989).

Much of our recent research is conducted from the perspective of coteaching (described below), a subject-centered (first-person) research methodology (e.g., Holzkamp, 1983).<sup>3</sup> This methodology does not seek to dwell in immediate understandings of experience.

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<sup>3</sup> There are natural scientists, too, who suggest that radical phenomenological first-person inquiries constitute the ultimate test case for scientific theories (e.g., Hut, 1999; Varela, 1996).

Rather, beginning with such praxis-oriented understanding of contradictions, it seeks to generalize these understandings to a societal level and, in this, to increase the room to maneuver for making necessary structural changes that entail improvements in existing conditions. To achieve such generalizations, we draw on critical hermeneutic phenomenological analysis, an interpretive method based on the dialectic of understanding and explanation (e.g., Ricœur, 1991).

### Contradictions in an Urban Teacher Education Program

In this section, we describe and theorize an example of a traditional teacher education program as it was enacted at Penn. We use two compound vignettes as a representational strategy to highlight relevant issues in a condensed form; compound vignettes are literary form to report ‘central tendencies’ appropriate for ethnography. We articulate the problems in the form of contradictions as they are made salient through the lens of activity theory.

#### Vignette 1: Traditional Student Teaching

Cam is enrolled in a teacher education program. He has been doing well in his education courses, including his science teaching methods course. At present, he is teaching grade 9 science as part of his practicum in the class normally taught by Mr. Spiegel. He has planned out the chemistry unit he wants to teach and plans each of his lessons well ahead of time. Sometimes he comes to see his science methods teacher and supervisor (Tobin) or peers to help him with specific details of a lesson.

When Cam came to City High School his cooperating teacher Mr. Spiegel was quite content to leave him with the grade 9 class Scott was to teach. In fact, as soon as Scott was ready to teach his first class, Mr. Spiegel left the class ‘to give Cam the space to develop his teaching.’ Mr. Spiegel felt that it was best for Scott to learn how to cope on his own, given that only a few months later, he would be teaching full-time. For Cam it was a swim or sink situation.

Tobin, Cam's methods teacher comes to formally observe him teaching. He usually brings his clipboard with the yellow observation check forms attached that contain the evaluation items. As Cam teaches his lesson, Tobin scans the lesson plan, checks, among other items, whether Cam keeps to the time line that he had planned, how he uses language, and appropriateness and currency of the pedagogy. In the course of the lesson, he circles Cam's appropriate level of performance on each criterion listed on the official evaluation form.

When they meet to debrief the lesson, Tobin admonishes Cam for permitting several students to be unengaged, heads down, apparently asleep and certainly not paying attention. Tobin suggests that it would have been better to arouse each of the students and get them to attend to the lesson. He explained that Scott should have gone and firmly touched the shoulder of those concerned and quietly asked them to raise their heads and engage. His rationale for doing this is that because the class consists entirely of African American students Cam should show that he is not intimidated, he should not make a public issue of the incident, and he should try to use the opportunity to build rapport with the student.

Cam was not pleased with Tobin's suggestions. 'Why don't you tap them on the shoulder and deal with the consequences?' he thought. In his journal that night Cam wrote: 'They [professors] present a lot of different theories and they want you to pick and choose and develop your own from that. Which I think is good, but they don't ever go into the nuts and bolts, the everyday stuff that a teacher does. My problem is never seeing that never seeing a teacher as a facilitator.' Cam felt short-changed. He criticized the university methods class for not providing 'ideas and things that work' for him. Cam felt disempowered for the failure of his methods class or his cooperating teacher, or anyone else, to teach him how to teach. Furthermore, he was dismayed by the lack of fit between the science teaching espoused in his university methods course and his experience in the

classroom. Cam, as many other students, describes university methods courses as ‘idealistic,’ and he feels left alone during his practicum.

### Vignette 2: First Year Out

Although Sofia was enrolled in Penn’s urban teacher education program, her first semester field assignment as a student teacher was to a suburban elementary school. Her internship was quite successful there. However, Sofia also wanted to be certified as a high school biology and general science teacher. Thus, after one semester of successful teaching in a suburban elementary school Sofia requested re-assignment to a school in which she could teach both elementary and secondary grade levels. We identified an urban public school with grades 4-12 in which Sofia could meet her goals. It was a ‘magnet’ school for the most talented students in the school district. To remain at the school students needed to maintain a high grade point average and perform in a satisfactory way. Sofia perceived her teaching experiences at the school as highly successful and so too did her supervisor (Tobin) and cooperating teacher. She was able to replace the cooperating teacher by taking over the class almost immediately. As her teaching exhibited the same middle class values that the students brought with them from their home situations, students learned as well as they would have with their regular teacher. At the conclusion of her field experience Sofia was highly recommended and the school principal endeavored to hire her. However, Sofia was assigned by the school system to a position as teacher in an urban middle school.

When Sofia was offered the position she called Tobin to discuss her reservations about the job. She was decidedly anxious about teaching in a school and community that she regarded as unsafe. Sofia had heard stories about the misbehavior of students and the failure of the school to measure up academically. Tobin assured her that she would be successful and promised to provide her with some equipment and supplies that she needed.

After the first day in her new school, Sofia called her former methods teacher and supervisor in tears. She was determined to quit and to go to medical school. Although

Sofia had been among the best student teachers, she now found her class completely out of control and had no ideas about what to do. None of the suggestions that she received appealed as a suitable remedy for what appeared to be a totally dysfunctional learning environment.

Sofia received a variety of forms of assistance and over time gradually learned to teach her grade 7 students. These were very different students than those she had taught during her one-year student teaching experience. Although the teacher education program emphasized equity, poverty, culture and teaching and learning in urban schools, Sofia was not only unsuccessful but had few ideas of what to do. Furthermore, her initial tendencies were to teach in ways that were consistent with the ways in which other teachers in the school taught. Many of these practices were in direct opposition to what we considered appropriate. Yet Sofia's initial efforts were to keep the students busy with seatwork and bribe them through a rewards system that included hefty punishments for breaking rules.

After a year of emotional trauma and continual struggle Sofia learned how to teach her students. She earned their respect and by the end of the year she had their confidence and most had constructed her as their teacher. Ironically, after a stressful year in which she learned to teach in an urban middle school, Sofia accepted a transfer to the magnet high school in which she had done her student teaching.

#### An Activity Theoretical Analysis

Underlying the idea of learning to teach in praxis is the assumption that activity does not only transform the object, but also the subject and its mediated relations (Cole & Engeström, 1993). Contradictions such as low levels of student knowledge (Figure 1, contradiction #1) or an instructional language that is at odds with the language spoken by students in 'urban' schools (contradiction #5) do not exist for all student teacher activity systems. Rather, these problems are contingent on the situations, as shown by the differences between the field experiences of Cam and Sofia in urban and suburban schools.

On the surface, the activity system of the student teacher looks like that of a teacher. In the traditional teacher preparation program student teachers, as illustrated by the cases of Cam and Sofia, take the place of the regular teacher and frequently are left on their own with the students. However, an analysis of the situation reveals many contradictions that in fact interfere with the regular object of teaching to bring about change in students' knowledge (Figure 1). In fact, there exists a quaternary contradiction in that the student teacher is constructed as a subject by an evaluation team including the cooperating teacher, field experience supervisor, and methods teacher. This contradiction is articulated in Figure 1 as a secondary contradiction (#3), the power relations to which student teachers are subject with respect to those who evaluate them.

In Cam's case, there are also contradictions in his relations to students, cooperating teacher, supervisor and methods teacher. First, students know that student teachers are in their classes only for short periods of time. The normal rules of interaction within the class and with the teacher often do not carry over to the student teacher activity system, leading to an 'unruly, disrespectful, loud and obnoxious class' that Cam described in our opening excerpts (contradiction #2). Especially when the cooperating teacher leaves the class (or, as in Sofia's case, with new and inexperienced teachers), students exploit the situation ('They [students] challenged the new guys because they were new guys'). Such resistance to student teaching is not ubiquitous. It has been pointed out that it is likely to occur when there is a considerable distance between students' primary dispositions and the (middle class) dispositions embodied in and to be inculcated by school culture (Bourdieu & Passeron, 1979). This resistance is similar in form to that which reproduces the subversive practices among factory workers who wrest the control of symbolic and real space from the official authority (Willis, 1977).<sup>4</sup>

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<sup>4</sup> Bourdieu uses 'habitus' to signify what Lave (1988) and others refer to as 'structured structuring disposition.'

As a result, students learn less than they would have if the regular teacher had taught the class. In fact, many teachers regard student teachers as substitutes after whom they have to ‘re-teach’ or ‘clean up’ to bring students ‘up to speed again’. There is therefore a tertiary contradiction, here indicated as contradiction #4, between the outcome of the student teacher activity system and that of the more advanced activity system of the regular teacher. As a result, regular teachers consider student teachers a necessary evil, because they have to ‘mop up’ after them and ‘re-teach’ some subject matter after the student teachers have left. Other teachers at CHS have outright refused the principal’s assignment of student teachers to their class.

There are also institutional contradictions between school and university (#6). From a university perspective, student teachers are in the schools to learn by applying their knowledge, and to be evaluated as to their competencies as teachers. From a school perspective, the student teachers often take the place of teachers and therefore are part of activity systems intended to assist students in learning. There is therefore a conflict in the intentions between the two institutions, particularly in terms of the expected outcomes. Frequently, there is also a tacit conflict between school personnel, who know teaching through their daily praxis, and university personnel, who are considered to know teaching mostly through theory (which is often considered inapplicable in praxis).

Given enough time, many teachers—which includes teachers with longtime experience (e.g., Tobin, 2000)—who find themselves in urban schools will transform their activity systems so that the initial contradictions no longer exist. They develop rapport with students, earn their respect, manage to establish rules of interactions that support learning, evolve pedagogies that work, and adapt their instructional language to accommodate the learning of students. Often, however, the changes are of a ‘work around’ nature, where individuals adapt to a troubled system rather than changing structural relations that only arise when individual problems are recognized as contradictions in the system (e.g., Holzkamp, 1983). For example, Mr. Spiegel went to buy materials out of their own pocket

or borrowed chemicals from the nearby university labs. It became known only at the end of the school year that there were \$74,000 unspent in his learning center (about 200 students and 5 teachers). A structural change—in the form of a more equitable and democratic approach to the control of financial resources—is likely to improve teaching and learning in the individual classroom.

However, learning to teach and being successful in suburban schools does not guarantee success in an urban school. The past practices in Penn's teacher education put student teachers into schools with students that are as they had been themselves (i.e., student teachers with a background in suburban or private schools are placed in suburban schools or magnet schools in the city). As Sofia's experience showed, she was very successful. But what she had learned as a teacher was not 'transferable' (traditional teacher training assumes transferability) to an urban neighborhood school, embodying a different culture, rules and norms of interactions, pedagogies, or students' primary discourse. Neither her field experience nor her extensive (and successful) coursework prepared her for her initial teaching assignment, which required the development of a very different activity system. Thus, the practices at Penn embodied a contradiction with the declared intent of the program to prepare urban teachers. An unintended consequence might be that recognizably excellent teachers such as Sofia struggle in their first year of employment as a teacher and when the chance arises they leave the urban schools that need them most for suburban and private institutions. Such an exodus fuels a cycle of reproduction of culture embodied in a system of objects (e.g., Sahlins, 1976), that is, schools that are hierarchically ordered in terms of their desirability.

#### Coteaching: A Model of Participatory and Emancipatory Learning

The existing contradictions in teacher education at Penn (those that we described and others) were identified in an ongoing program of research (e.g., Tobin, Seiler & Smith, 1999) and catalyzed questions about some of the key assumptions of the program.

Coteaching in communities in which learning to teach is highly valued (e.g., Roth, 1998b) emerged as a potential solution to many of the problems we had identified. The fundamental idea underlying coteaching is similar to those that underlie efforts—more prevalent in Europe than North America (Bannon & Bødker, 1991)—to maximize ‘learning at and for work’ through democratization of the workplace (e.g., Engeström, 1994; Onstenk, 1999). Working together, at each other’s elbows, is essential because it enables greater challenges to emerge and be met and thereby opens up opportunities to learn from others not only in explicit but equally and more importantly, as Bourdieu (1992) points out, in tacit ways. Working together and sharing praxis is fundamental to learning in many domains (as pilots, nurses, bank employees, carpenters), not only to the learning of beginners but also that of old-timers (e.g., Roth, 1998b).

We also needed to re-think the school-university relationship and the different activity systems in which student teachers traditionally found themselves. That is, we had to deal with the quaternary contradiction between the construction of the individual as a teacher, on the one hand, and the activity system focusing on student learning, on the other.

From the beginning of our reform, we regarded teacher education and the associated research as a core transformative activity in praxis. We assumed that a fuller integration of teacher education in the praxis of teaching, accompanied by a host of social relations to more or less adept peers would provide more resources and remove the contradictions that interfere with learning to teach. That is, we focused on the improvement of learning of the high school students. This required our student teachers to become more legitimate participants in teaching at school. We wanted to avoid a perception that the assignment of student teachers to the school was in any way an encumbrance that was detrimental to the learning of the high school students. Instead we assigned the student teachers to small learning communities (SLCs), schools within schools, and we negotiated the distribution with SLC coordinators and teachers in such a way that (a) coteaching would occur and (b) that student teaching was to benefit the high school students.

Coteaching fundamentally means to take shared responsibility for teaching a class in order to enhance student learning. This means that teachers collectively plan their unit and lessons, teach (though one person may take the lead while the other serves to support the lead person), construct assignments and evaluations, and engage in regular debriefing sessions that also include students from the class. The newly existing division of labor among teachers in the classroom affords new opportunities in managing activities, assisting individual students, coping with disruptions, alternating in the lead, and so forth. Because the regular teacher is present in the classroom, behavioral problems that often arose when student teachers were left on their own no longer emerge. Not surprisingly, we note that demands on and stress levels of individual teachers decrease and opportunities for learning in the class increase. The high school students whom we interviewed or who participated in our debriefing sessions generally appreciated the increased opportunities to receive teacher assistance, different ways of teaching, and having a choice with whom to interact. We also noted that over time, coteachers develop practices in which they seamlessly interact, often without the need to communicate verbally.

From an activity perspective, coteaching provides an ideal context for learning by providing a 'zone of proximal development' (e.g., Vygotsky, 1978) in which the collective achieves more than any individual alone (e.g., Roth, 1998b). This zone of proximal development arises from the dialectic relation between social and individual development and is defined as the 'distance between the everyday actions of individuals and the historically new form of the societal activity that can be collectively generated' (Engeström, 1987, p. 174). Coteaching therefore affords (new) collective actions that span a zone of proximal development. These collective actions become, as part of ongoing praxis, part of the individual action repertoire and therefore enlarge the action potential of the individual teacher. The individual member makes a contribution to the development of the community, and thus indirectly to her own development and learning process. Learning is therefore an

integral and inseparable aspect—and one of the characteristics—of the praxis of teaching and learning.

To deal with the contradictions arising from the traditional hierarchical location of student teachers, teachers, and university personnel, we extended coteaching to all individuals intending to ‘evaluate’ or ‘research’ teaching. That is, researchers, supervisors, and methods teachers participate in teaching the lesson in the pursuit of the ultimate goal of enhancing the learning of the high school students. Our key principle for coteaching is ‘do not blame others for problems if you have not done anything about them yourself.’

In addition to learning in tacit modes while teaching at one another’s elbows, coteaching provides an ideal ground for teachers to develop their teaching (praxis, lived experience) and explanation (talk about praxis). Having experienced a particular class from a similar point of view (as teacher), and having had to make decisions in the same mode of temporality, they now have opportunities of talking about, and thereby develop explanatory accounts of, these shared events. That is, their shared lived experiences provide them with a common resource for constructing shared formal explanations (re-presentations) of their praxis. Student representatives are an integral part of these sessions. Our research shows that their contributions are valuable and valued and lead to ongoing change in teaching practices of newcomers and old-timers alike (e.g., Tobin, Roth, & Zimmermann, 2000). Our cogenerative dialogue sessions provide the forum in which successes, failures, and (failed) opportunities are raised and analyzed.

Thus, in the classroom and in the debriefing sessions, coteaching partners engage in a development of their praxis as well as their talk about praxis. They participate as teachers, though their respective experience and competencies for teaching in urban schools may differ. We have gathered considerable evidence and testimony that cooperating teachers, supervisors, and methods teachers learned tremendously in the coteaching arrangement (e.g., Tobin, 1999; Tobin, Seiler, & Smith, 1999). Despite their previous hierarchical relationships with student teachers and each other, the participants in coteaching learn and

become models of learning for each other. For example, the following quote shows how a cooperating teacher recognized problems in teaching and learned from coteaching.

When [Tobin] came, we did a physical science unit. I think it was at that time that [Tobin] found out how difficult it really was to actually teach science... When I was coteaching with [Tobin] I got some great ideas. I learned from him how to use different visual aids and about many physical science activities, including that cool paper helicopter investigation. I really liked our sound wave activity, a really great activity where we took the kids out into the street. (Spiegel, 03/15/00)

The playing field between formerly hierarchically situated participants (student teachers, cooperating teachers, supervisors, and methods teachers) is leveled in the coteaching situation, thereby removing several contradictions in the previous teacher education model. First, quaternary contradictions no longer exist between subject (student teacher) and subject construction (by evaluative team). Second, the tertiary contradiction that existed between the outcomes of teachers' and student teachers' activity systems, student learning, has been removed as all participants strive to maximize the outcome of teaching. Third, the hierarchical relations that differentially placed student teachers and cooperating teachers with respect to university personnel were removed.

The changes were experienced in the previously separate university and school community. Teachers at CHS felt that they learned tremendously, in addition to getting a reprieve from their otherwise demanding jobs where they usually take sole responsibility. Student teachers largely experienced coteaching and the subsequent reflection as overcoming the gap that normally exists between theory and praxis.

It was helpful to read [particular text] in order to ascertain the main tenets of cooperative learning, but I did not fully understand his premise until I put it into action myself... This speaks to the bridge between theory and practice. (Andrea, 06/02/00)

Coteaching is not a panacea. It neither removes all contradictions nor does it prevent new contradictions from emerging. A central contradiction that occasionally arises is that between the epistemology implicit in the new teacher education program and that espoused by a student teacher. We documented such a contradiction in the student teacher Mr. J. He had a tremendous subject matter competence and did not believe in coteaching with people whom he considered to be inferior. He approached the high school students in a lower stream as if they were enrolled in college level courses. Despite his problems in maintaining an order in the classroom that would afford learning, he was against coteaching as a context for teaching and his own learning. We had to negotiate a solution in which Mr. J. ended up teaching gifted students in a university lab to remove this contradiction in our new program.

We sometimes face another contradiction that is usually framed by participants as 'personality conflict'. For example, in one situation the student teacher Donna was to coteach with another student teacher and a cooperating teacher. She quickly pointed out that she could not coteach with her peer, for she 'had worked with people like this forever and knew that it could not possibly work out.' However, she also clashed with her cooperating teacher over teaching styles, pedagogy, and beliefs about learning. It was only through further negotiations with other cooperating teachers that most of the contradictions could be abated.

Our research documents tremendous learning in the network of activity systems with which we are concerned. Our work is ongoing, for we feel that we have a moral obligation not only to maintain positive university-school partnership but to continue to foster expansive individual and institutional learning to occur and thereby to continue to actively transform activity systems concerned with teaching and learning to teach.

## Discussion

In this article, we described a teacher education program before and after restructuring top coteaching. Coteaching rests on the assumption that learning to teach—like all learning (e.g., Lave, 1991)—is a situated social practice best accomplished in collaborative work. We assumed that our beginning teachers would develop knowledgeability and construct teacher identities through the legitimate peripheral participation in the social practice of teaching. The differences between the traditional goals of City High School and Penn (which we believe are exemplary of many other situations) gave rise to a contradiction that interfered with a smooth transition from legitimate peripheral to full participation, and thereby the development of knowledgeably skilled identities was hampered. Because of the virtual identity of training and work settings for our beginning teachers, we assumed that they are better prepared and would take their place “as’ is with little additional learning’ (Joyce & Clift, 1984, p. 116) in an urban school once they have left university.

Democracy in the workplace is probably much more achieved in Scandinavian countries than in North America (e.g., Ehn, 1992; Henderson & Kyng, 1991). Making coteaching the central tenet of the teaching arrangements in the school-university partnership has resulted in a more democratic context for teacher education in the sense that all participants are regarded as both teachers and learners. Teaching has become the locus for learning to teach, not only for those individuals in the teacher preparation program but also for those in traditionally higher positions such as the cooperating teacher, university supervisor, and methods instructor. That is, the relationship between primary and adjacent activity systems of learning to teach, evaluation, and teaching have been fundamentally shifted. Although there are still contradictions in the activity systems of some participants in the teacher education program at Penn, coteaching has reduced the number of contradictions that existed in its previous structures. At the same time, it has increased the structural opportunities for mutual learning, both in tacit ways by participating and in explicit ways through reflection on practice.

We do not claim that such transitions go without problems. Rather, we see such transformations in terms of activity systems that undergo constant developmental transformations in order to reduce the number of contradictions that impede with its primary goals (e.g., Engeström, 1999). Coteaching really requires us to rethink the notion of ‘student teacher’, perhaps along the line of legitimate peripheral participation (Lave & Wenger, 1991), which changes as a result of participation in the daily praxis that characterizes the community. Lave (1991) argues for a replacement of the traditional hierarchical teacher/student and expert/novice divisions in favor of a more continuous old-timer/newcomer distinction. As a result of learning on the job, new teachers then construct (and are constructed) an identity of belonging to the community, which effectively moves them into the community so that they become in turn a constituent element in the activity system of other new teachers. (On the movement of constituent elements in activity systems see Engeström, 1996.) As a result of our intervention, this construction of our new teachers’ identities has changed, for they are no longer considered burdens on the school, but insert themselves as valuable resources in the daily work of the school. In addition, the focus has changed from learning-to-teach to teaching-to-learn, a change that Lave (1996) considers to be a crucial step in any removal of the fundamental contradictions of schooling.

Coteaching establishes new relations between the stakeholders from both sides of the school-university partnership, in class and in meetings designed to allow learning through ‘reflection on action.’ It has been noted that the incentives for learning on the job are strong when the work problems encountered are serious, when there is interest in solving them, and when there are opportunities to reflect on them (Engeström, 1994). Coteaching leads to particularly fruitful meetings because all individuals have participated in the events, though they all have their own perspectives on just what happened. Because in our situation, different viewpoints are valued and considered to be starting points for learning, all

participants contribute in their ways to solving the problems of teaching and learning in urban schools.

A key aspect of our intervention was the establishment of a sense of 'being-in-it-together,' that is, a sense of forming a community of practice (Lave & Wenger, 1991). In such communities, members that are differently situated in terms of expertise (pedagogy, subject matter, subject matter pedagogy, or teaching experience) each provide social clues for learning and problem solving. A key aspect in our communities is the easy accessibility of experienced colleagues and supportive supervisors. The regular meetings in which participants can engage in collective problem solving, giving and taking support and feedback, recounting of 'war' stories contribute to the learning of all participants.

#### Acknowledgments

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

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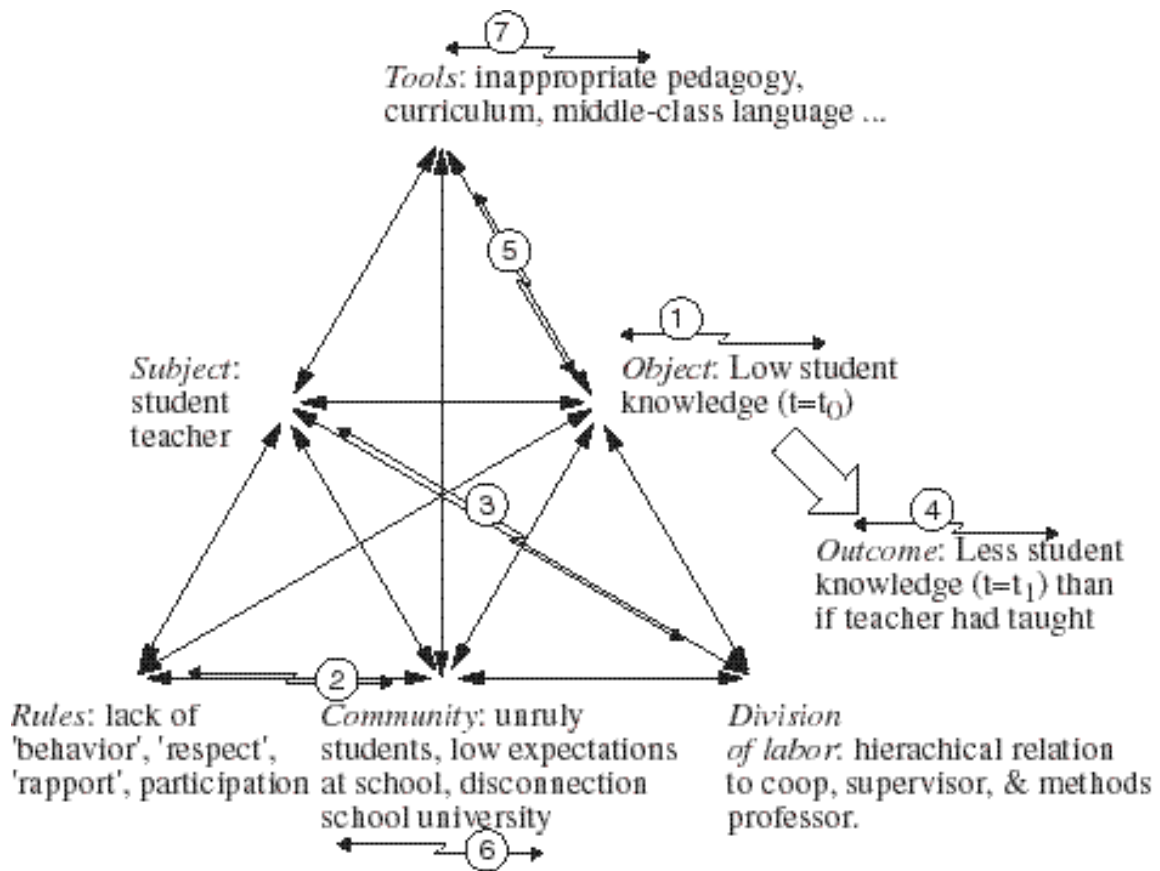
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**Figure 1.** Activity system of a student teacher who is taking the place of a regular classroom teacher. The flashes identify the locations of some contradictions in this activity system.