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ABSTRACT

BECOMING A REFORM-ORIENTED TEACHER

By

Lauren Claire Pfeiffer

In this study, I explored some of what it takes for a teacher to support her continued, self-directed professional development; what helps and what hinders her development as a reform-oriented teacher in a period of intense educational change.

The context of this study was my collaboration with Lisa Pasek, a sixth grade teacher in a mid-size, Midwestern school district. One way Lisa chose to pursue her development of a sixth-grade teaching practice was to experiment with how she might use videotapes of her own classroom to learn about her mathematics teaching. She was interested in how the videotapes might inform her efforts to develop a discourse with children in which they explore multiple perspectives on solving particular mathematical problems and look to themselves and to their peers as sources of support for their own learning. Lisa was also curious about how she might use videotapes of her teaching to talk with her faculty colleagues and administrators about her practice.

To explore the question, What and how does a teacher learn from conversations around videotapes of her own teaching?, Lisa and I met regularly during the 1992-93

school year. The activities of our work included videotaping her sixth grade mathematics classes, talking in preparation for her to share the tapes with colleagues, reflecting (in writing and in dialogue) about occassions when she showed videotape to other teachers and talked about her practice, and individual and joint presentations of our work at workshops and conferences. I gathered the following data: (1) videotapes of Lisa's mathematics classes; (2) audiotapes and transcripts of Lisa's conversations around these video records; (3) my fieldnotes and journal; (4) Lisa's journal; and (5) audiotapes and transcripts of conversations and interviews with Lisa.

The analysis focuses on three contexts in which Lisa engaged in conversations around videotapes of her teaching: discussion in a teachers' group, dialogue with me, and a classroom discussion with her sixth grade students. Through my study of these sets of interactions, I learned that Lisa's educative use of videotaped records of her teaching required that she construct and employ new kinds of knowledge about teaching and learning. The kinds of knowledge needed to support Lisa in critical examination and articulation of her understandings, beliefs, and her practices are of a different order than the knowledge of learners, subject matter, pedagogy, for example, identified as part of a knowledge base for teaching. Specifically, Lisa's learning in this study reflects her development and use of *professional participation knowledge*, a domain of knowledge for a teaching practice that supports her capacities to work with colleagues on individual and collective inquiry into teaching and learning.

To my parents
Claire and David Pfeiffer

My first and most cherished teachers

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I was standing with a long time friend and colleague, admiring the work of an artist who combines her watercolor painting and calligraphy with the literary work of well-known authors. My friend turned to me, pointing to Thoreau's words: "...to live intentionally...," and commented that they reminded her of me. I was touched by her words. I was also taken aback by the reflection she offered me. With the writing of this dissertation I am deeply grateful for an opportunity to acknowledge many of those who have taught me the importance of living and learning intentionally, some who have shown me what it looks like, and others who have joined me in the adventure.

I begin with my gratitude and admiration for Lisa Pasek. She made our work together intriguing, absorbing, challenging, and at times, great fun. She shared openly her gift of speaking and writing intellectually from her heart. I earnestly offer my thanks to her for all she has taught me about the challenge of becoming a reform-oriented teacher.

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I acknowledge and thank the members of my doctoral committee. I am grateful to my director, Christopher M. Clark, for his commitment and support throughout my doctoral studies. His vision of reforms in teaching and learning and his passion for real change that supports authentic learning in caring communities continues to be an important source of inspiration for my work. His experience, insight, and capacity for taking a different perspective provided me with valuable tools during the dissertation project and on into new work. I am grateful to Helen Featherstone and Deborah Ball for their committed support in helping me puzzle through complex aspects of my analyses. I am grateful for Helen's careful resolve to help deepen my work, for her enthusiasm in joining me as a learner of the work, and for, still now, her writing lessons. I value Deborah's hard questions, her modeling of "confident uncertainty," and her thoughtful perspective on the work and lives of classroom teachers. I thank Evelyn Oka and Patrick Dickson for their supportive inquiries and responses to the work in progress.

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I was blessed, too, with an opportunity to live and learn in a graduate school community that crossed disciplines and generations of graduate students. In an era of professional learning that presses beyond seminars and coffeehouses, I am grateful to a enormous group of graduate school colleagues, including: Michelle Parker, Lynn Cavazos, Ruth Heaton, Ginny Goatley, Janet Navarro, Paul Vellom, Randi Nevins, Jordy Whitmer, Neli Wolf, Martial Dembele, Tammy Lantz, Lynn Brice, and Dan Schultz. I thank them for their generous and varied contributions to my learning. I extend special gratitude to my colleague and friend, Jenny Denyer, for her wisdom, her care, and her guidance. I cherish the joy we share that comes with our commitment to educative experiences.

As my time at Michigan State University criss-crossed a territory of instructional design, educational technology, professional learning, and educational psychology, a special group of educators contributed to my learning and development. I wish to acknowledge in particular the teaching and mentorship of Joseph L. Byers, Cassandra L. Book, Stephen Yelon, Norman Bell, Sharon Feiman-Nemser, Susan Florio-Ruane, and Magdalene Lampert. These faculty members shared with me their perspectives, their experiences, and their wisdom in ways that have truly guided my professional life. I extend to each of them my deep and sincere gratitude.

My family is a continuing source of strength and joy—my first and most cherished learning community. My parents, Claire and David Pfeiffer, have never wavered in their unquestioning love for me nor their belief in my potential. I am especially grateful to them for knowing how to support me "at a distance," for sharing my delight that "life is what happens while we are making all the plans," and for never really doubting that "I would be

fine." I am grateful for the many ways my family cared for me during the course of this work. My brother and sister-in-law, Craig and Cissy Pfeiffer, provided a haven in the woods for reading and writing and thinking. My brother and sister-in-law, Tim and Susan Pfeiffer, provided a haven in the mountains for rest and renewal. My sister, Julie Pfeiffer, provided a unique haven in our relationship for my head and my heart. Her genius for asking good questions, listening deeply, and nurturing me through the creative process, supported me in ways that only she could as both sister and colleague.

My husband, Gary Childs, crossed my path as I was riding the last stretches of this particular trail. I am grateful for his capacity to listen, watch, and wait, with endearing patience as I closed the book on this important part of my life's journey. I admire his energy and enthusiasm for learning—and his commitment to share what he learns with others. I cherish our choosing to continue our journeys together and to help each other live and learn intentionally.

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Prologue

My principal teacher was experience; I learned to teach through trial and error in the classroom. As a classroom teacher, I lived the self-socialization Daniel Lortie (1975) describes as personal experience, supplemented by collegial assistance that I screened and adapted to my individual practice. For six years I survived, and in some ways thrived, in a culture of individualism and mutual assistance. Then came a time when I started to ask hard questions about my work in schools and about my own development as an educator--as a learner. What are we teaching? What are they learning? What does it really mean to say "I am a teacher?" This time is marked for me by the memory of a conversation with a colleague:

Sitting in her car in my driveway, I listened to Nan speak the same words of frustration, disillusionment, and undirected determination that had been stuck in my own head for some time. The ungraded math papers on my dining room table tugged at my conscience, but my sharp awareness that this was a kind of conversation I had never had before kept me riveted to the seat as the ideas and the words and the questions came pouring forth.

Nan and I were both elementary classroom teachers. We met when we enrolled in a Masters course in elementary language arts at a small university in Indiana. During the last half of the term we traveled together to the nearby campus for a Tuesday night

class that offered lots of ideas and activities related to whole language curriculum, active child participation, and meaningful assessments of student learning. I can't remember much about the course now. What I remember is talking with Nan. I remember the striking sense that I was talking with another teacher in a way that was rare during my first five years of teaching. We sat in my driveway and tried to make sense of the vague "hungry" feeling we had in common. We sat there a long time. My conversation with Nan was the first occasion on which either of us spoke openly and thoughtfully about these big questions and the implications of our lack of answers. We wondered how we would ever stay motivated to teach in our respective settings year after year. In the middle of another school year, our immediate futures were quite predictable and that in itself was unsettling. Aside from the reward of personal relationships with the children, the work and the accomplishments of the teaching year would be similar to last year's and to next year's. It was good, but it wasn't good enough. "I want more," we each confided, "but, I don't really know what 'more' is or how to get it." More than all the talk in the course sessions, this was the conversation that pushed me to think and to wonder and to question my own professional development. Later, I would learn that educational researchers have studied teachers' career paths (Feiman-Nemser and Floden, 1986; Huberman, 1989; Ball and Goodson, 1985) and I would find language and ways of thinking about experiences and questions I could only describe then as a kind of hunger.

I tried to describe for Nan the intellectual high I experienced when I participated in the university class sessions--the conversations, the descriptions of alternative approaches to instruction, the debates that were launched when we spoke of our

experiences in classrooms. I also told her how it seemed that the intellectual high was tied to those Tuesday night sessions and it stayed locked up in the university classroom. It didn't seem connected to the tasks and issues that awaited me the next morning. The intellectual high would tease me. I would hear myself talk in this class and I would want to continue the conversations, but such talking, such thinking wasn't part of my work at the elementary school.

I saw Nan only two or three times after we finished the course. As our separate lives continued to unfold, it became clear to me that this December conversation was the beginning of a transition. For me, it was a critical event in making sense of my experience as a classroom teacher and wondering what my place in the field of education could be. After another year of teaching, I chose full time graduate study as my "something more." I came to graduate school an experienced classroom teacher. By then, I was very hungry.

CHAPTER ONE

Teachers' Professional Development In The Context Of Reform

We are living and teaching in times when the struggle to affect changes in the professional development of teachers is more conscious and more visible than ever. Understanding that current reform agendas (see, for example, NCTM, 1989, 1991) require enormous and complex learning on the part of teachers, some reformers are calling for new forms of professional development (Ball & Cohen, 1996; Lord, 1994). Such innovations call for teachers to situate their continued learning in their ongoing practices, and to talk openly and in detail about their beliefs, decisions, and actions as teachers (Little, 1993). Examples of these innovations include participation in teacher groups, collaborations with university based researchers, the use of videotapes, stories, and conversations about the complexity of teaching and learning in schools. Whether the function of the teachers' group is to engage teachers as writers in and out of the classroom, to support teachers' development of alternative approaches to assessment, or to assist teachers' investigations of the psychology and pedagogy of teaching mathematics for conceptual understanding, the burgeoning reports of teachers meeting and talking together in groups suggest a shared view that conversations about teaching and learning can support teachers' efforts to teach in the context of reform. (see for example, Schram, et al, 1995; Harris, 1995; Florio-Ruane & deTar, 1995; Cavazos, 1993; Nathan, 1991).

Researchers argue that talking together in groups is a powerful medium for learning (Moll, 1990; Tharp and Gallimore, 1988; Bruner, 1986; Vygotsky, 1978; Dewey, 1938; 1902). The theories of learning guiding most of the current reforms propose learning as a social process by which we come to new understanding through our interactions with others. The notions that we learn through our interactions with others, that we take pieces of those interactions into subsequent interactions, that we use these interactions to construct meaning, and that we use our meanings to make sense of our experiences--both past and present--continue to press nationwide efforts to change the way we interact with children in classrooms. This perspective on learning has been part of the last fifteen years of educational reform, raising difficult questions about what it means for children to learn school subjects. This perspective has contributed to the creation of new subject matter standards that call for children to be active participants and responsible owners of their own learning (NCTM, 1989,1991; NCTE, 1996).

These notions of learning are also influencing the field of teacher learning. Researchers and teacher educators are asking difficult questions about the design, development and implementation of professional development activities for teachers. Many are interested in grounding these activities, too, in theoretical frames of learning through social constructivism (Ball & Cohen, 1996; Cohen, et al., 1993; Calderhead, 1993; Leiberman & Miller, 1992). Judith Warren Little (1993) argues that teachers' professional development must shift from a dominant model of teacher training to teacher learning, where teachers' intellectual curiosity is acknowledged and their contributions to

knowledge and practice are credited. She points out:

> Compared with the complexity, subtlety, and uncertainties of classrooms, professional development is often a remarkably low-intensity enterprise. It requires little in the way of intellectual struggle or emotional engagement and takes only superficial account of the teachers' histories or circumstances (p.148).

Reflective of reformers' efforts to address the poverty of intellectual engagement as an integral part of teacher's continued learning is Brian Lord's (1994) concept of *critical colleagueship*. Critical colleagueship is an alternative professional stance held and acted upon by teachers. Through their interactions, teachers reflect this stance of critical colleagueship when they move beyond sharing ideas and supporting one another through the change process "to confronting traditional practice--the teacher's own and that of his or her colleagues--with an eye toward wholesale revision." In prompting educators to shift from a paradigm of teacher training to teacher learning, Lord outlines six elements included in the development of critical colleagueship:

1. Creating and sustaining productive disequilibrium through self-reflection, collegial dialogue, and on-going critique.
2. Embracing fundamental intellectual virtues. Among these are openness to new ideas, willingness to reject weak practices or flimsy reasoning when faced with countervailing evidence and sound arguments, accepting responsibility for acquiring and using relevant information in the construction of technical arguments, willingness to seek out the best ideas or the best knowledge from within the subject-matter communities, greater reliance on organized and deliberate investigations rather than learning by accident, and assuming collective responsibility for creating a professional record of teachers research and experimentation.
3. Increasing the capacity for empathetic understanding (placing oneself in a colleague's shoes). That is, understanding a colleague's dilemma in the terms he or she understands it.

4. Developing and honing the skills and attributes associated with negotiation, improved communication, and the resolution of competing interests.
5. Increasing teachers' comfort with high levels of ambiguity and uncertainty, which will be regular features of teaching for understanding.
6. Achieving collective generativity—"knowing how to go on" (Wittgenstein 1958) as a goal of successful inquiry and practice (p. 193).

While Lord outlined these elements as part of a *holistic* casting of what is involved in critical colleagueship, I see them as a good starter set of ideas salient to the focus of the study reported here. These elements refer to the skills of inquiry and the stance of uncertainty a teacher must acquire in order to engage in an approach to teaching that is quite different from any approach she may have studied as a preservice teacher or as a beginner.

What these elements call for is complex, difficult to model—let alone guide—as teachers engage in changing their practices. There is much practice and study to be conducted if we are to understand Lord's concept in context, and identify the challenges, as well as the achievements, it proposes. By nature of the call itself, I think classroom teachers must play a key role in creating this complex and difficult new work.

Responding To The Call For Critical Colleagueship: A Social Constructivist Perspective

Thinking about classroom teachers as learners in the context of their work means thinking about the creation of opportunities, resources, and strategies that can facilitate their development of new knowledge, new skills, and new stances to be employed across

the variety of contexts that comprise a teacher's practice. The work requires a kind of engagement in which teachers explore what they think they know; for example, how they make sense of why it is difficult to sustain a conversation with fourth graders about negative numbers.

We have all experienced the frustration that occurs when we have difficulty explaining an idea that we thought we understood. Further, we know the excitement that occurs when we find that in explaining our idea to someone else, we actually gain a better understanding for ourselves. Duckworth (1987) describes the power of having learners explain verbally what they think as a means of sense making:

1. Trying to make their thoughts clearer for someone else, learners achieve greater clarity for themselves.
2. Learners determine what they want to understand. The explanation they give also provides them with the questions they want to ask.
3. Learners come to depend on themselves as judges of what they know and believe.
4. Learners experience the power of having their ideas taken seriously.
5. They learn enormous amounts from other learners.
6. Learners come to recognize that they have constructed their own knowledge.

The theories of learning that guide Duckworth and other reformers describe learning as a social process by which we come to new understanding through conversational interactions with others.

Currently, many educational psychologists, particularly those involved in educational reform work, have turned their attention to theories of learning and development that come from the sociohistorical school of psychology. Russian theorist

Lev S. Vygotsky led the study of social origins and cultural bases of individual development (Cole, 1985; Wertsch, 1990; Scribner, 1985). Vygotsky's work is centered on a foundational concept of individual development. The range between what we can do alone and what we can do with the help of others sets the boundaries of our *zone of proximal development:* "What the [learner] is able to do in collaboration today, he will be able to do independently tomorrow" (Vygotsky, 1987, p. 211).

The implications of this view of learning are manifested in significant and visible changes in what "doing school" looks like. In "The Teacher and the Taught," Clark (1990) points out an important shift in the role of the teacher :

> In neo-Vygotskian theory, the aim of good teaching is to give the game away to the learners. Through "scaffolding"--the gradual transfer of responsibility and control to the group of students--the adult teacher moves away from center stage to become a coparticipant or even an outsider in the learning community. The course may be about algebra or art or history or English, but in this framework, schooling is also about collectively initiating, creating, and sustaining an inclusive learning community. In the long run, this community-building feature of inclusive teaching may be of as much social, developmental, and educational value as are the learning and remembering of academic content (p. 263).

Social constructivist views of psychology prompt us to think about both the child and the teacher as learners working together in classrooms. Luis Moll (1990) describes Vygotsky as unusual because he was an educator turned psychologist. He cites the observation of Vygotsky's collaborators: "Vygotsky demanded that psychology become more than a scientific study of education and go beyond abstract theoretical knowledge and intervene in human life and actively help in shaping it"(Leontiev and Luria, 1968, p.

367). Vygotsky's conviction that a psychologist must be not only a thinker, but a practitioner as well, can be reversed: a teacher must not only be a practitioner but a thinker as well. The two roles are inextricably linked and mutually dependent. This relationship is readily recognized as the age old problem of connecting theory and practice in learning to teach; of relating language, thought, and action in making sense of human development.

A radical shift in what counts as learning *changes everything* about understanding learning to teach. If learning is social and much of what is being learned resides in the collective, what does it mean to be prepared and named as a teacher, or to maintain and enhance the generic skills and inert knowledge first encountered in preservice training? Is it even possible to think of school learning as a fundamentally social endeavor and still think of teaching as an individualistic practice? The organization of schooling may still treat teaching as a private practice. But learning to teach and learning from experience by veteran teachers must begin to break with this reductionistic and disempowering pattern, especially when the leading edge reforms of classroom teaching and curriculum are founded in social constructivist learning theory.

Reforms underway incorporate social constructivist understandings of learning into the design and practice of teachers' professional development, though these are few and undersupported (Little, 1993). The aim of these reforms is to support new students of teaching in continual learning to teach in the company of their colleagues. "The newest approach to teacher education is less about certifying finished products and more about

getting something started--a complex of learning, discourse, inquiry and action that will thrive and evolve for thirty years" (C. M. Clark, personal communication, 1994).

Investigating and reframing their wisdom of practice can lead teachers to new ways of thinking about children, subject matter, and self, and can encourage teachers to act in new ways. Through this work they may come to see their teaching--and themselves and others—in a new light.

Teacher Groups

Teacher educators organize and facilitate teacher groups, in part, as alternatives to traditional inservice programming. Teachers join teachers' groups--and in some places, organize them on their own--in pursuit of resources and support for their work in classrooms (Featherstone, 1996; Cochran-Smith and Lytle, 1993; Featherstone, Pfeiffer, & Smith, 1993; 1995a; Schifter & Fosnot, 1993a).

Reformers are calling for new norms of professional work where teachers talk about teaching, observe and critique each other's practices in the classroom, work together to design and prepare curriculum and actively pursue together real instructional improvement (Little, 1990; Lord, 1994; Ball & Cohen,1996; Johnson, 1990; Lieberman & Miller 1992; Little &McLaughlin, 1993) . These "critical practices" (Little, 1982) are features of settings where the intellectual and professional growth of teachers is as much an expected condition of school life as the intellectual development of children. What does

it take for teachers to participate in these new forms of professional work in ways that align with the reforms of school learning and support their efforts to make changes in their practices?

Challenges To The Reform Of Professional Development

Before describing the design of the study, I want to sketch a framework of three aspects of current professional development reforms: (1) the culture of teaching, (2) teachers' conversations, and (3) self as learner and self as teacher. I believe these aspects to be critical influences on the new work I've described above. In what follows, I draw on literature that addresses these aspects as challenges to real change and as constructs for understanding the complexity of teacher learning in the context of reform.

The Culture of Teaching

Teachers entering fully into their local teaching practices meet with long standing patterns of social interaction in schools. These norms of interaction support a culture of sameness where teachers present their similarities and hide their differences as they relate to their perspectives, experiences, and skills in teaching. The culture of teaching is premised largely on a notion that a teacher's practice is private, that what a teacher does in her classroom with her students is largely an individual endeavor shielded by a shared sense that an individual practice also means a private practice. When we, as teachers, talk

about our teaching, from behind a social shield of privacy, we talk about it in ways that serve to protect that privacy. This allows us to tell stories of our practice that reinforce the notion that one teacher's practice is more similar to than different from another's. We tend to reinforce a cultural belief that the ways one teacher thinks about curriculum, thinks about instruction, and acts on assessment, is pretty much, more or less, the same as the next teacher down the hall. Or, we accept differences as personal preferences and take a hands-off, non-interference approach to each other's work. When differences arise in conversations about teaching practices we find ways to work around them. It is more common to hear choruses of agreement around the lunch table than to hear bursts of disagreement, debate, or even wondering about challenges and complexities about good teaching. Little (1982) has described the culture and the relations of teachers within it in this way:

> This conception of collegial relations is consonant with portraits of teachers' work that have altered little over decades (Waller, 1961[1932]; Fuchs, 1969; Lortie, 1975). One cannot examine the boundaries of teachers' professional relations without taking account of [the] pervasive "ordinary reality" of sporadic and informal exchange. A school's staff may be described as "close," offering large doses of camaraderie, sympathy, and moral support, but the texture of collegial relations is woven principally of social and interpersonal interests. Teacher autonomy rests on freedom from scrutiny and the largely unexamined right to exercise personal preference; teachers acknowledge and tolerate the individual preferences or styles of others. Independent trial and error serves as the principal route to competence In all these ways, the modal conception of collegiality is both characteristic and reinforcing of a culture of individualism, presentism, and conservatism (p. 513).

Critical Awareness of the Culture of Teaching

For the most part teachers have lived and worked without active knowledge of or attention to their culture of teaching. Traditionally, the body of knowledge constructed and shared about the culture of teaching has been acquired by researchers: observing from the outside, at times participating in, documenting, and describing the roles and relationships which shape and govern the culture of schools. [1] Researchers have been the ones to develop theoretical frames and vocabulary for talking about the culture of teaching. While numerous former classroom teachers may have insight that is powerful for examining culture, many practicing teachers do not attend actively or critically to the norms and structures that shape their professional lives. Sources of knowledge about the culture of teaching and uses of this knowledge have remained largely outside the culture.

I do not intend to suggest teachers are unaware of their culture, but the extent to which they explicitly refer to it, examine it, and challenge it, has been limited and at times, dismissed as the way things are. Now, in the context of reform, classroom teachers are beginning to attend critically to the culture that surrounds their work. The press to engage in collaborative work with colleagues, to talk about one's teaching and to actively attend to the features of one another's practices is making visible norms of interaction, relationships, and structures that can support or stifle productive dialogue among educators. As I think the study reported here will show, teachers responding to the current reforms in education are engaged in learning about the culture of teaching and are

[1] See Floden and Feiman Nemser, 1986 for a review of the literature on the culture of teaching.

constructing for themselves new knowledge of the ways, norms, and relationships that shape their work with colleagues and in turn, their work with students. For perhaps the first time, teachers are becoming conscious—and vocal—about these features of their work lives.

As this critical awareness emerges, reformers and teacher educators, and teachers as well, face a powerful issue in their efforts to foster and support new collegial relations in the name of professional development: *the norms of interaction—ways of being—called for in reformed professional development activities, those guided by theories of social constructivism are diametrically opposed to the norms of interaction in the traditional culture of teaching.* Several researchers have described and analyzed the problem of fit between the reforms and the cultures of schools (e.g., Little, 1982; Lieberman, 1988; Liston & Zeichner, 1990; Hargreaves, 1992). Many of these analysts take as their starting point the organizational features of schools and teaching culture. In contrast, I think this study takes as a starting point innovative forms of professional interactions among teachers grounded in principles of learning. That is, principles that emphasize the importance of making explicit one's understanding and one's uncertainties about the practice of teaching and drawing on the richness of multiple perspectives as a resource for continued learning (Cohen, Talbert, and McLaughlin, 1993).

Teachers committed to enacting current reforms in the existing culture of teaching experience the problem of non-interference with the personal preferences of colleagues as an unresolvable tension. They struggle to balance a sense of belonging to the local culture

of teaching with a conscious sense of becoming a teacher who raises questions of her own practice, opens her practice to the scrutiny of others, and seeks collegial help in engaging in inquiries and experimentations in teaching. A culture of teaching that reinforces norms of privacy and sameness among its members presents a direct barrier to the teacher who seeks a community of learners where differences can be educative.

Teachers' Conversations

A second challenge to the reform of teachers' professional development is the nature and purpose of teachers' conversations. Anyone closely associated with teachers and teaching has learned that teachers carry with them ready to share stories of life in the classroom. Talk of classroom life, "teacher talk", fills the staffroom, the hallways, and the corners of the school playground. The stories teachers tell are a familiar part of the culture of a school; they describe everyday life in classrooms. A teacher's lengthy description, her use of jargon, and her tone of storytelling pique our own scholastic memories. And perhaps because we all share some experiences of schooling, classrooms, teachers, and lessons, we listen and respond to teachers' stories as a form of entertainment. The connections to our own mischief as young students and clumsy children, or our struggles as little scholars, are vividly recreated in a teacher's story of yesterday's events. In telling a story, a teacher knows she can touch memories, painful and joyful, in ways that remind her that it is good to share these stories.

Yet it is this familiarity between the teacher storyteller and the most available

audience (e.g., friends and family) that seems to disqualify a teacher's stories as subject matter for her own analysis of teaching and learning. Relatedly, the mistaken belief that a teacher's work is bounded by her interactions with children, between 8 a.m. a nd 3 p.m., makes it difficult to appreciate talk of teaching outside of the classroom as a vital part of their *work*. It is "just teacher talk."

Contrastly, in the context of teacher education reform, teachers' talk about life in classrooms is recognized as a critical component of meaningful, sustained learning about practice[2]. As reformers, we ask teachers to engage in collective thinking and problem solving that necessarily draws on stories portraying messy events and real questions from their real classrooms. We ask teachers (along with teacher educators and researchers) to participate in forums that are fundamentally different from individual- and product-oriented "make-it-take-it" workshops. With aspirations of creating new and meaningful forms of professional development, we ask teachers to change long standing patterns of communication with colleagues. Many reformers and teacher educators suggest this change may best be supported through conversation, dialogue, and storytelling.

Through their study of narrative and its connections to teachers' stories, educational researchers have provoked a wave of possibilities for new forms of teacher education. Nationwide, teachers, together with researchers and teacher educators, are beginning to experience a depth of inquiry into teaching and learning afforded by authentic

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[2] See Changing Minds, Spring, 1996: Teachers Helping Teachers, for an examination of five teachers' groups where conversation, problem-solving, and long term support help to create careful, critical communities of learners.

storytelling and conversation; an inquiry that pushes beyond the surface difficulties of learning new techniques. Teachers are learning to take seriously their own stories as ways of exploring and understanding the complexity of teaching and learning in schools and the embeddedness of professional issues in their full, complicated, developing lives as late 20th century women and men.

On the whole, educational researchers have come late to honor storytelling as a powerful form of knowledge representation and a context for learning. Jerome Bruner, noted developmental and cognitive psychologist, has been instrumental in bringing the study of narrative in other disciplines to the work of educational researchers and teachers interested in understanding narratives and how they contribute to learning. He has theorized that we order our experience in one of two separate and distinct ways:

> There are two modes of cognitive functioning, two modes of thought, each providing distinctive ways of ordering experience, of constructing reality. [These are: the narrative mode and the paradigmatic mode.] The two (though complementary) are irreducible to one another.... Each of the ways of knowing, moreover, has operating principles of its own and its own criteria of well formedness. They differ radically in their procedures for verification (Bruner, 1986 p.11).

D. Jean Clandinin and Michael Connelly are noted leaders in the tradition of research on teachers' stories (Carter, 1993). Their program of research on teachers' personal practical knowledge (Clandinin and Connelly, 1988; Clandinin , Davies, Hogan, & Kennard, 1993; Clandinin, 1986; Connelly & Clandinin, 1985; 1988) provides a deeper understanding of the ways teachers know teaching experientially. They argue that learning

to teach and sustaining oneself in the work involves striving for narrative unity. For an individual teacher, theory and practice cohere with the "images, rituals, habits, cycles, routines, and rhythms" (1985, p. 195) they come to know through lived experiences.

Reform-oriented teacher groups support teachers as learners and encourage storytelling as a way to situate their learning in daily practice. When telling stories in authentic conversations about their practice and their lives as teachers, the storyteller and the listener together create occasions for learning. Together, they enter what Harre (1984) describes as the Vygotsky space. In this space, storyteller and listener create a social interaction in which language mediates their sharing of experience and understanding. Once shared publicly, the interaction becomes part of the private cognition each participant carries into subsequent public and private iterations of thought, language, action, and reflection. Movement through the public/private spaces of interaction is a central concept of social constructivist theories of learning (Vygotsky, 1978; 1981; Wertsch, 1990).

As a form of teachers' professional development we are only beginning to explore what happens through and because of teachers' talking together about practice (Clandinin, 1986; McConaghy, 1991; Cavazos, 1994; Goatley, 1994; Florio-Ruane and deTar, 1995; Swidler, 1995; Pfeiffer and Featherstone, 1996). But keep in mind, telling stories is not *new* to teachers; it has long been a part of the culture of teaching. What is new is valuing of teacher narrative and efforts to prompt and support teachers' use of stories in ways that are educative. Telling stories to learn to teach is a new kind of work. Harold Rosen

(1989) commented that, "the educational world doesn't [yet] accept that telling tales of teaching as richly and honestly as we know how is a totally valid means of teaching each other" (p.164).

The personal stakes are high when a teacher offers an honest account of the messiness and uncertainty in many of the tasks for which she is held accountable. In a self study of her learning to teach mathematics differently, Ruth Heaton (1994) wrote about the frustration she felt when she made visible to other teachers her understanding of the complexity of her changing practice. Instead of joining her to grapple with hard questions and issues of pedagogy, Heaton met with unsolicited advice and innuendoes about her ability to teach:

> I tried to initiate a conversation about changing practice around what I thought were several difficult and complex mathematical and pedagogical issues that I saw as key to teaching mathematics for understanding. Much to my surprise, no one wanted to talk about the problems I encountered. Everyone wanted to offer me solutions. One by one, those who had listened to me unveil my problems offered me suggestions for what I should have done differently. My problems were viewed as simple, the solutions were seen as obvious.
>
> My fellow educators wanted to be supportive but we viewed my teaching differently...What I was concerned about could not be fixed by suggesting that I try this or do that. No one but me seemed to see the teaching or the mathematics I was trying to help students learn as inherently difficult. At the time, I could not understand what was happening. I fought back feelings of inadequacy and frustration. Part of me felt badly for not knowing, thinking that I should have known, while another part of me had spent a year learning to appreciate the value of not knowing, of never being certain, in a practice that was improvised. Why couldn't these people see the complexity I could? I feared I appeared to others as incompetent for having questions about practice, the same questions that I have been praised for recognizing and others had pondered with me...(p. 368).

Heaton's experience and her stance as a learner were dismissed by colleagues who favored instead a shared commitment to readily naming and fixing problems of practice. Heaton's efforts to engage in intellectual examination of the complexities of her teaching were thwarted by the strength of other teachers' advice giving about want she *should do* to *act* like a teacher.

Engaging in teacher conversations as an active and focused form of professional development work, honoring uncertainty and questions of pedagogy as opportunities rather than incompetencies, and taking steps to challenge the traditional assumptions about what makes teaching difficult, require that teachers stand in new relationship to each other. As I believe this study will highlight, these new and different relationships must serve two purposes concurrently: 1) they must be relationships in which teachers can learn to engage in new forms of dialogue about their work, learning that requires new skills, a strong sense of confidence and courage in the face of long standing norms of non-invasive collegiality; and 2) these relationships must becoming self-sustaining in order to support the continual change and reflection called for in the reform of continued professional development. Burbules (1993) has noted the reflexive character of the dialogical relation:

> To the extent that [dialogue] helps draw participants into such relations, and the communicative interactions they support, it can promote actual development of these relations, to the point where they do become self-sustaining...we develop our capacities for creating and maintaining such a relation only by being in it, and so must work with, and within, at least some of the relations we have available to us. Waiting for ideal conditions in which to pursue or express these values means that we will be waiting a terribly long time. This bootstrapped process is the essential problematic

> of learning in and through dialogue. We teach our partners, they teach us, and we each teach ourselves in the context of sustaining and developing the dialogical relations we actually have. We improve by imitating, practicing and experimenting in the midst of real-time activities (p.49).

Reform-oriented teachers need knowledge of the kind of conversations that currently dominate their interactions, images of the kind of conversations that are possible when teachers work in dialogic relation with each other, and skills to engage a kind of conversation that offers opportunities to examine their work and learn from their own experience and the experience of their colleagues.

Self as Learner and Self as Teacher

A third challenge to teachers' professional development is the relationship of a teachers' personal/professional identity to her continual learning and development as an educators. Slowly, with false starts and little to no support, teachers engaged in projects of education reform are beginning to develop new identities as teachers that stand in stark contrast to the commonly held image of the classroom teacher. Teachers who envision, for their students and for themselves, communities of learners guided by social constructivist views of teaching and learning also envision substantial changes in the culture of their profession and their identities as educators.

Learning to teach means, in part, exploring the question, what does it mean to say 'I am a teacher?' Responding to this question means developing a self image—a

conscious sense of self—as a teacher in the classroom. It also involves developing a self-image as a member of the profession, figuring out where one belongs in relation to a range of colleagues and associates. As I think this study shows, coming to know oneself in practice can only take place in relation to others, through the creating and sustaining of critically collegial relationships. Such relational work in teaching can contribute to sustaining one's professional development in ways that are meaningfully situated in local contexts and personal experiences.

Learning to teach also means learning to reason through, articulate, and act on one's view of teaching. This work is a process of figuring out where one stands on issues of practice (e.g., What is the place of effort grades in assessing a child's learning? How should curriculum be created and for whom?). It is also a process of figuring out one's multiple roles both in and out of the classroom, interacting with children and adults in the school community. In the many forms it may take, this is a kind of intellectual work in teaching that contributes to one's on-going development of a stance toward teaching and a conscious engagement with one's practice.

These conjectures about learning to teach: developing a sense of self as a teacher and learning to reason, articulate, and act on one's view of teaching, mark for me a changed in perspective on professional development. As a classroom teacher I believed that professional development was getting smarter about subject matter. Certainly it was about learning new instructional strategies, about learning to design, develop, and enact curricula, and about learning to measure student progress. I believed that if I was

acquiring knowledge and skills in these areas, then I was developing as a teacher. I still believe that these are important elements of professional development. But I have learned from my work in this study that fundamental to this knowledge and skill development is the psychological and social development of a teacher's identity—one's view or stance toward teaching and one's relationship with other teachers.

A third conjecture about learning to teach in the context of reform involves developing strategies for managing the tension that can arise between the intellectual work of reform-oriented teaching and the relational work of belonging to a culture of teaching. In addition to learning more and different subject matter and fundamentally different approaches to pedagogy, teachers must also learn to recognize moves, muster resources, and develop social and psychological tools for managing the predicaments that arise from engaging in the critical examination of practice while participating in the current culture of teaching. This kind of learning includes helping teachers to identify themselves as intellectuals and to view their continued learning and development as an explicit part of their work as teachers. It also includes helping teachers sustain an awareness that an identity as a teacher intellectual is a dramatic shift in the prevailing images of teachers in most schools. Moreover, they will need to work to establish the descriptor as a legitimate view of teachers and teaching. A decade ago, Giroux (1988) argued that a way to reconceive the nature of teacher work is to view teachers as transformative intellectuals. He wrote:

> The category of intellectual is helpful in a number of ways. First, it provides a theoretical basis for examining teacher work as a form of intellectual labor, as opposed to defining it is purely instrumental or technical terms. Second, it clarifies the kinds of ideological and practical conditions necessary for teachers to function as intellectuals. Third, it helps to make clear the role teachers play in producing and legitimating various political, economic and social interests through the pedagogies they endorse and utilize (p.125).

The concept of teacher intellectual has a powerful link to the vision held and described in the reform documents. Teachers, living and working as intellectuals, are teachers who fully embrace a stance and a commitment to the calls, the questions, and the hard work of educational change; they are reform-oriented teachers.

Becoming A Reform-Oriented Teacher

There is a growing awareness among researchers, teacher educators, and classroom teachers themselves that it is no longer acceptable to believe that professional growth is gained from the disjointed, isolated activities, and packets of prescribed information that are *given* to teachers to *tell* them what teaching is and how it should be performed. Teachers know a lot about what they do. They know a lot about creating environments and activities that help students learn. They also know that there is more to be learned about teaching. Critical to their work as teachers is their direct involvement in creating their own continuing education, individually and collectively, about what it means

to teach and to learn in classrooms. The challenge is to find ways to help teachers develop the knowledge and skill needed to be more active participants in the on-going and integrated design of their own professional development in the practice of teaching. The challenge is to find ways to help teachers become reform-oriented professionals engaged in the complex work of educational change.

Teacher Reflection and Learning from Practice

Researchers suggests that the work of classroom teachers is strongly influenced by *what* they think; *how* they think; and *when* they think about their practice. Their work is based on "thoughtful and systematic (though often implicit) notions about students, subject matter, teaching environments, and the teaching process itself" (Yinger 1986). Many reformers believe that the power of professional development in teaching is in helping teachers to make these implicit beliefs explicit and to see the relationship between their own beliefs about teaching and learning and the impact of those beliefs on their interactions with students in the classroom (Calderhead, 1993; Lampert & Ball, 1990; Fullan & Hargreaves, 1992; Louden, 1991; Schon, 1991; Witherell & Noddings, 1991).

Becoming a reform-oriented teacher, as I have described here to include knowledge of the culture of teaching, of teacher interactions, and of self as teacher, necessarily calls on a teachers' capacity to reflect on the particulars of all aspects of her practice. The term *reflection* is often used in describing how teachers might interact with

their cognitions about teaching and learning. Donald Schon (1987) has examined reflective capacities in the performance of professionals (e.g. architects, lawyers, and artists) and he claims the perception that professionals conduct their work based on a concept of technical rationality is not accurate. He explains:

> Technical rationality holds that practitioners are instrumental problem solvers who select technical means best suited to particular purposes. Rigorous professional practitioners solve well-formed instrumental problems by applying theory and technique derived from systematic, preferably scientific knowledge (p. 3).

Schon argues that real-world situations do not present themselves in such systematic ways. Rather, they appear as "messy, indeterminate situations" (Schon, 1987, p. 3) that require the practitioner to draw on various sources of knowledge and to creatively use that knowledge to construct new understanding about a given situation. This is an accurate description of the complex interactions that occur in every school classroom. Teachers are constantly engaged in interpreting, analyzing and evaluating multiple phenomena, while at the same time, they are carrying out a variety of tasks.

Often, when asked about their work, teachers cannot explain to someone else how and why they perform as they do. Schon refers to this inability to verbally explain what is revealed in intelligent action as "knowing-in-action." The knowing is embedded in the action and when the action is broken down for verbal description it is no longer an accurate account. However, Schon explains that it is sometimes possible for practitioners to reveal the tacit knowledge underlying their actions through observation and reflection on those actions. Their accounts will vary depending on the purpose for their reflecting

and the language they have for verbalizing the description (Schon, 1987).

Another distinction, important to developing new lenses for professional learning and development for teachers, is that between *reflection-in-action* and *reflection-on-action.* Reflection-on-action involves thinking back on what has already occurred to make sense of the influences that guided the action. This thinking occurs when a practitioner's knowing-in-action fails; when some interruption has kept the practitioner from performing in the automatic manner that was anticipated. At other times, it is possible to reflect on one's knowing-in-action and to make adjustments to the action without interrupting the task performance. Schon refers to this as reflection-in-action and describes the process as a *reflective conversation* that practitioners have with the situation, deriving new meanings and determining new steps (Schon, 1987).

Schon points out that, "Clearly, it is one thing to be able to reflect-in-action and quite another to be able to reflect *on* our reflection-in-action so as to produce a good verbal description of it; and it is still another thing to be able to reflect on the resulting description."

These concepts of reflection seem to map onto a teachers' classroom practice in straight-forward and helpful ways. It is helpful to think about a teacher talking through her reasoning for changing instructions to the whole group or adapting an explanation for a particular student. In reflective conversation with the situation in the classroom, a teacher draws on her knowledge of the subject matter, the particular learner or learners and the goals she has for the activity at hand to guide her --to know-in-action-- how she

wants the interactions to proceed. Layers of reflection: reflecting *on* our reflection-in-action and reflecting on the resulting description can all help a teacher to construct and reconstruct the sources of knowledge the teacher draws on in those messy, indeterminate situations. What does the mapping look like for teachers' practices *outside* of the classroom? More specifically, what does reflection look like when a teacher is learning to engage colleagues in critical conversations or raising difficult questions about teaching and learning, questions that rock the culture of sameness or threaten the safety of peer relations?

When teachers ask questions about their work, investigate why they teach as they do, and study the relationship of their interactions with students to their beliefs about teaching and learning, they engage in a kind of professional development work that has stronger potential to surround and support their actions in the classroom than many traditional in-service interventions. In part this is because—in creating this interaction between their own teaching and their own learning about teaching—teachers engage in efforts to raise their own awareness of how they make sense of the multiple influences that shape and bound their work.

Again, at the heart of this work are teachers' conversations and storytelling. Teacher storytelling groups, collaborative research projects, and teacher study groups are promising examples of professional development forums where teachers gather, sometimes in company with university-based teacher educators and researchers, to learn from articulating and interrogating their experience. In these forums, teacher talk is taken

seriously; it is given space and time and respect as intellectual work. 'Learning from experience' in this context is fundamentally different from the trial and error education in many teachers' histories. It puts at the center of teachers' learning the kind of intellectual work I was beginning to sense in my early masters study experience, (See the *Prologue*), with a crucial difference: teacher groups support learning in ways that are deeply connected to life in teachers' particular classrooms. Through teacher group work, teachers are supported in making stronger links between the intellectual work they do in and out of the classroom. And they find good company with likeminded colleagues who share their aim of becoming reform-oriented teachers (Featherstone, Pfeiffer & Smith, 1993).

A Teacher and A Researcher Explore What's Possible

For the past seven years, I have had the opportunity and privilege of working with Lisa Pasek, a teacher committed to the unending challenge of learning to teach. In Lisa's good company, I have explored some of what it takes for a teacher to support her continued self-directed professional development; what helps and what hinders her development as a practicing teacher in a period of intense educational reform. Additionally, I have explored how my own learning as a researcher can both contribute to and be served by a collaborating partnership.

In the spring, 1992, Lisa Pasek, a sixth grade teacher in a mid-size, Midwestern

school district invited me, a researcher with the National Center for Research on Teacher Learning at Michigan State University, to help her document her mathematics teaching with videotape during the coming year. Lisa and I met through the Investigating Mathematics Teaching (IMT) group--a group of teachers from mid-Michigan and university-based researchers who meet regularly to talk about the teachers' efforts to change the way they teach elementary and middle school mathematics. Lisa hoped the tapes might inform her efforts to develop a discourse with her students in which they explored multiple perspectives on mathematical problem-solving and looked to themselves and to their peers as sources of support for their own learning. Lisa also hoped to use videotapes of her teaching to talk with her faculty and administrators about her practice.

Lisa's interests and concerns created an authentic context for me to explore some of what it takes for a teacher to support her continued self-directed professional development; what helps and what hinders her development as a practicing teacher in a period of intense educational reform. Drawing on sociocultural theory (Vygotsky, 1978; Moll, 1990; Wertsch, 1985) and ethnographic methods (Erickson, 1986; Hammersley, M. and Atkinson, P. 1983; Erickson and Shultz, 1981) I pursued an investigation rooted in the ongoing practice of a classroom teacher. The following question guided this research project: *What does a teacher learn from conversations around videotapes of her teaching?*

Additionally, I was interested in these questions: (2) What is the nature of the discourse as a group of teachers and researchers respond to a teacher's narrative around a

videotape of her teaching? (3) What does a teacher learn about herself as a teacher by reviewing videotapes of her practice in conversation with other educators? and (4) What is the nature of our collaborative relationship in trying to support this work?

Overview of this document

My aim in this opening chapter has been to situate my work, my research interests in general and this study in particular, in the current context of reform in education. I have sketched a framework of three aspects of reform work in teacher professional development, each of which is influenced by social constuctivist theories of learning. In subsequent chapters, I will continue to explore this set of challenges to reform, drawing specifically on the study of my work with Lisa Pasek, to articulate my own learning about the challenge of becoming a reform-oriented teacher.

In Chapter Two, I introduce Lisa and our collaborative approach to this study. I describe the ethnographic methods and sociolinguistic techniques that guided my documentation and analysis of our work.

In three chapters that follow, I look closely at aspects of our work together. In Chapter Three, Lisa shares her videotape with the IMT group and I examine the rights and duties that surround her conversation with the group. In an analysis of Lisa's reflections on this experience, I learn about a shift of these rights and duties that supports the emergence of a culture of critical colleagueship. In Chapter Four, Lisa and I spend time in

her classroom after school, re-viewing the videotape she shared with the IMT group and segments of video from other mathematics classes. Our conversations, notes, and journals document Lisa's efforts to develop the conversational skills that will advance her sharing videotape with other colleagues and her continual understanding of her mathematics teaching with her students. In Chapter Five, I present a weaving of events that took place in the spring our year together, a time during which Lisa explored a new inquiry situated in her practice. This small investigation became a site for Lisa to make connections between her experiences as a learner, a beginner teacher, and her envisioned identity as a reform-oriented teacher. Together we learned about the impact of the reforms of school instruction on a teacher's personal/professional identity.

In Chapter Six, I draw on our experiences, our reflections and analyses, and the theoretical constructs that have guided my study to discuss some of the learning that Lisa was engaged in during this year of professional development work with the IMT group and with me. I describe the kinds of knowledge Lisa was constructing and using. I speculate about what this study suggests might be needed for teachers to actively participate in substantive and sustained work in the current context of reform.

CHAPTER TWO

Lisa

I met Lisa in October, 1991, when she joined a teachers' group at the National Center for Research on Teacher Learning (NCRTL) at Michigan State University. Lisa and seven other elementary and middle school teachers agreed to participate in a project organized as a masters level independent study called Investigating Mathematics Teaching (IMT). From a research perspective, the aim of the project was to explore how practicing teachers might use a set of materials that were being developed for mathematics teacher education.

What began as a course for credit and a pilot research study evolved into a voluntary teachers' group that, seven years later, continues to meet regularly on the MSU campus during the school year. In the IMT group, the teachers seek and provide social and intellectual support for their efforts to change their mathematics teaching. While they came to the group with different amounts of teaching experience (1 to 21 years), different grade level responsibilities (first through seventh grades), and different opportunities and constraints in their districts and communities, these teachers all share an interest in developing a practice of mathematics teaching radically different from their own experiences as schoolchildren. They are looking for, giving, and getting help in making their way.

I came to the first Thursday night meeting as a research assistant, interested in experienced teachers' learning in the context of educational reform, and curious about how new technologies (e.g., hypermedia, videotape) might support teachers' learning to teach in new ways. For me, the project was a site for bringing together questions about professional development that grew from my own intellectual hunger as a teacher, my interest in the relationship between constructivist theories of learning and new technologies, and my conviction about the importance of working with teachers in ways integral to their lives in classrooms.

Lisa came that first evening at her academic advisor's suggestion that the IMT project might be an interesting and helpful extension of her summer project: a study group that read and discussed the NCTM *Standards* (1989; 1991). She was interested in finding ways to stay connected to people and opportunities that would help her sustain a vision of teaching she had only begun to grasp as she left her preservice program and entered the field as a teacher.

In this first meeting and at most subsequent meetings of the fall term, 1991, we spent part of our time together watching and discussing videotapes of Deborah Ball's third grade mathematics classroom[3]. As the year progressed, the teachers in the group shifted

[3] These videotapes were part of a collection of materials generated by Mathematics and Teaching Through Hypermedia (M.A.T.H.). In the summer of 1989 The National Science Foundation funded the M.A.T.H. project permitting Deborah Ball, Magdalene Lampert, and colleagues to document the teaching and learning in their classrooms. Over the course of the next academic year they videotaped many mathematics lessons, as well as interviews with students, mathematicians, and mathematics educators. They saved and reproduced all student work including the math journals in which students wrote everything, homework and tests. A team of graduate students kept fieldnotes on the mathematical and pedagogical issues raised in each lesson, and reproduced the teaching journals. During the following two

their focus away from Deborah Ball, her students, and their problems of practice represented on the tapes. They began to talk more about *their own practices, their own students,* and *their own questions*. One of the ways my research colleagues and I supported this shift was to spend time in the teachers' classrooms. For several teachers this support included videotaping their math class and giving them the cassette to use as they wished.

Getting to know Lisa in those early meetings, I was impressed by her confident sense of self as a learner. Still conscious of the feeling that my own professional learning seemed to lie dormant and virtually untapped while I was a classroom teacher, I was struck by this third year teacher's active pursuit of colleagues who could help her. As she introduced herself to the IMT group in the fall of 1991, Lisa tried to articulate her struggle to develop a discourse-based classroom and how her perspective on teaching and learning conflicted with that of her public school colleagues:

> My name is Lisa Pasek and I was also in the teacher education program here at MSU. My first year of teaching I was at a Montesorri school which enabled me to really focus on math for understanding. It was really nice to jump right in and get my feet wet and try everything I had come away with from my undergraduate work. The next year I got a job teaching sixth grade in a public school. And the veteran teachers there are saying, that you need to give the right answer, period. I'm thinking, "Oh, no, this is horrible." So, even though I live an hour and fifteen minutes away, I come back here for support because even though there are teachers in Lake Port that are changing, the process is slow and people don't understand that you're not trying to [merely] change the activities, you're really trying to change the whole way you're teaching and they don't understand that. They think that it's just do an activity and then teach everything else. So,

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years Ball and Lampert worked with teams of graduate students to create videodiscs that would permit prospective teachers outside of the college to explore some of these materials.

> I've been working on developing discourse in my room and trying to get the kids talking to each other about their mathematical ideas and not to me. I've been slapping myself in the face when I want to jump in all the time (transcript 10-3-91).

Lisa's humor and animated descriptions, (e.g., "slapping myself in the face") became an expected feature of her talk in the group. The group learned to ready themselves to listen to Lisa with an ear for her use of images and metaphors. Her narratives would serve many functions, including lightening the burdens of struggle. Lisa would frequently mix her comments about serious concerns with quips and comic relief. Her introduction foreshadows this mix as she first conveys the urgency of her need for collegial support and then lightens the description of her struggle to develop discourse among her sixth graders.

As we took turns introducing ourselves that first Thursday night, each of the teachers described her teaching position and something of her relationship to mathematics as a subject matter. Several of the other teachers talked about fearing math or hating math; Lisa talked about dealing with--ideally, connecting with--her faculty colleagues. She was still struggling to learn to teach math differently than she had experienced it as a young student. She was still struggling to learn to create a mathematical discourse with her sixth graders. But, from the start, Lisa made known to the IMT group her primary need for support to "teach against the grain" (Cochran-Smith, 1991); that is, support as she tried to teach math in a way quite different from and somewhat threatening to other teachers at her elementary school.

Lisa's Story

A week after the first IMT meeting, I visited Lisa's three sixth grade mathematics classes and interviewed her after school. On February 4, 1992, I videotaped her math class for the first time. At the end of the school year, June 10, 1992, Lisa and I met on the MSU campus for another long conversation about her teaching. Through these initial one-on-one conversations, classroom visits, and the numerous Thursday IMT meetings, I learned about Lisa's experience as a learner and as a beginning teacher. In what follows, I have composed Lisa's Story, drawing on transcripts from our first year conversations combined with her draft of a learning autobiography written for a masters class she attended in Fall 1992. I merged parts of these texts and then gave the new text to Lisa for further revision and editing. This account introduces the reader to Lisa as a learner, a classroom teacher, and a member of the IMT group.

Learning about Oneself:

If I'm going to figure out where I'm heading,
I need to figure out where I'm coming from....

Lisa Pasek

While heading into teaching, and now, in the still early years of my career, a driving motivation of mine has been a passionate determination to avoid "falling into a RUT." The scariest part of this vague goal is that ruts are never well-marked so that you might easily avoid them, and actually, they seem to feel quite comfortable and secure while you're in them. In fact, people often remark that they never even knew they were <u>in</u>

a rut until they got out of it. "Whew!" they sigh. It also seems impossible to predict who might be next. Sometimes I hear teachers who I think to be the most energetic and creative teachers I know complain of feeling in a rut! That makes me wonder if one person's rut is another person's wonderful, refreshing revelation? And if that's true, then maybe we need to admit that a rut comes from inside. And so, this is my driving passion—or apprehension. But where does it come from and why does it haunt me so?

Usually when I think about the influences on my teaching, I think primarily of my university experiences at Michigan State. These experiences have been unique, out of the ordinary experiences. I have been blessed to have worked with some incredible people and innovative programs. In the past few weeks, however, I've been thinking that if these university experiences stick out in my mind as such ***critical turning points****, I must have been turning away from something...or towards a new alternative? So, a look at who I was before these critical events:*

Mom's Little Angel

An only child for seven wonderful years, and then the older sister of three brothers, I was a "second mom" by the age of twelve. During that year, I received a special badge from my girl scout leader, a friend of my mother's. This sensitive scout leader had recognized that my lack of badge earning was an effect of filling in, as best I could, for a mom who had recently gone back to work. This badge was an appreciated award for a dutiful daughter.

Schooled in a traditional Catholic school for eight years, my favorite class was English; sentence after sentence, in my best handwriting, underlining the subject once, predicate twice. High school was equally cut and dry as I carefully did my best to organize and memorize. The most positive benefit from my school experiences was a sense of belonging and of being supported; by my family, by my classmates of eight years, and by the diversity of friends I enjoyed in high school.

The College Of Business Welcomes You!

I enrolled at MSU with every intention of pursuing a degree in Personnel Management. I wanted to go into the training and placement of employees. I was taking business classes, but there was nothing that I was taking, as far as I could see, that would get me to that goal. Unfortunately, my business requirements of Statistics and Calculus

lacked **people**. *I was getting really frustrated and began playing around with the idea of going into teaching. By winter term I was hearing the echoes of a high school government teacher who had encouraged us, as seniors, to reconsider the teaching field as a rewarding option. I thought that placing people--interviewing and placing people in roles that are good for them--is a lot like teaching, so I decided to switch to education and it was like a tremendous weight had been lifted off me. I felt like I had truly found my niche; I felt like I belonged there.*

I began as a language arts major and that is my first love. I got about halfway through and I had taken a couple of math methods courses. Through high school, I had always struggled a little bit, but worked hard enough to get As and Bs. I depended on the teachers who would give you a second chance at the test and I worked really hard to memorize and get through each test. When I got to State, the math classes there were with foreign teaching assistants. I was failing math. I got my first zero point in Math 108 and it was just devastating. But I did have these math courses that would apply to teaching and I wanted to go for language arts.

The Allure Of Whole Language

The oldest of my younger brothers was diagnosed with a learning disability. I saw the tears and heartache caused by his having trouble with reading. In my sophomore year, I did an honors project on whole language as a result of following up on a reference to this alternative philosophy mentioned by one of my English professors. At the same time, I was working in a first grade classroom with a mentor teacher, as part of my teacher preparation program. My mentor was experimenting with components of whole language. We talked enthusiastically and openly about how her own teaching had evolved as a result of working with researchers from MSU who had asked her only to talk to them as she reflected on her teaching without any sort of evaluation or direct intervention from them in her classroom. It was here that I became very interested in teacher decision making. How do teachers make decisions about what they do? Upon what do they base their decisions? How can talking about your own thinking, in turn, **change** *it so radically?*

During my senior year, I engaged in an independent study with an MSU professor and a local second grade teacher. It was here that I first **felt** *the power of whole language. I experienced the empowerment of 7-year-olds. The teacher had offered some*

questions that I might ask the students about the books that ***they*** *were choosing to read for 45 minutes. Imagine my wonder when I asked a second grader why she chose a particular book to read and the young miss responded, "Oh, it's by one of my favorite authors! Here, let me read this part to you...." The valuing of learners and of their opinions and ideas made this classroom much more alive and rewarding that anything* ***I*** *had ever experienced.*

"And why do you think that?"

A Rethinking of Math, A Rethinking of Thinking

As part of my teacher preparation program, I was involved in a research project which required me to take a series of extra math courses, including one for which I had already met the requirements. Needless to say, I was ***furious****. Math was my least favorite subject, and it was unfair, I thought, to introduce new requirements now that I was already in the program. This series of classes was part of a study intervening in teaching teachers to teach mathematics. Not to be melodramatic, but it changed the course of my life. If they hadn't told me we were retaking the same course I'd had the year before, I never would have recognized it as the same course. The first time I had taken math methods, we "did" patterns. We did activities, but it was always, "Do this activity or exercise long enough so that you can memorize the pattern." Then on the test, you had to have the pattern memorized so you could extend it. When we took these classes over, I didn't even recognize the class until I went back through some of my old notes. This new coursework, to a large extent, completely retaught mathematics to me. Now, I could begin to see mathematics as sense-making. Operations had meaning and reasons behind them, and I could discover these reasons for myself! The format of the class valued reasoning, communicating your own ideas, valuing different ideas and strategies, making decisions based on mathematical sense, and building confidence in your own thinking.*

Perhaps just as crucial as this experience of my rethinking math was the opportunity to rethink my thinking. I was selected to be part of the "intensive study" embedded in this program. A small number of us, six or eight, were interviewed in depth each term. The researchers would interview us at the beginning and at the end of each term. We would fill out a survey, the exact same survey each time. They were watching how our answers changed over time. They asked us to talk about our responses to

questions and to talk about our teaching as that came into play. The question, "And why do you think that?" to this day guides me in reflecting on my own thinking. Those experiences really helped me to reflect on what I was getting out of those courses and made me realize how I was changing. I remember when they first interviewed me, one of the first questions was, "What are the parts of mathematics?" The most I could tell her was, "Well, there is adding, subtracting." I had no idea what she was talking about. I said, "Algebra and Geometry; there is Trig and Calc and that's all I can tell you."

It wasn't until quite a few interviews later that I was starting to see how geometry is related to numbers and I was starting to get a picture in my head about what mathematics is about. Before, I just could see textbook covers and had no mental picture. Being part of the research project helped me to get the most out of the course. This opportunity taught me about reflecting and about personally valuing my own perspective; my way of looking at things. This was incredibly empowering for me as a learner. I had thought about how to empower kids, but feeling this empowerment for myself was different. These experiences enabled me to begin to pull together my ideas about, "This is what I want, for myself and for my students."

After that, with all these extra math credits, plus the ones I had gotten from business, I ended up being closer to a math [minor] than I was a language arts [minor]. I felt that I was a living example that anyone can learn to think mathematically. So, I thought that's what I should choose.

Meshing with Montessori

My first year of full time teaching, fresh out of college, was in a Montessori school directed by a professor in my teacher preparation program at MSU. This was a wonderful year in which I was encouraged and supported in my attempts to try out my new ideas. The class size was about ten students to one teacher. It was a very workable situation. Because that school did not give out grades per se, it was the perfect opportunity to be able to talk with parents about what their children knew about mathematics and what they didn't know, rather than having to narrow it into a single letter grade. I was given third and fourth grade. I taught multiplication and fractions, all sorts of stuff that I really wanted to do. I had free rein there; I didn't have to worry about someone saying, "What page are you on in the textbook?" There was no textbook. It was all teacher-created materials.

It was also my first opportunity to come up against people who would question or challenge my ideas. This setting required me to continue to think hard about my rationales in teaching. Having one of my professors there at the school, as support, made it a natural transition from the university to "real life." During this time I was introduced to Junior Great Books. This training provided me with a vision of where thoughtful readers end up. This seemed to be a more sophisticated version of whole language than exists at the primary levels, where students make decisions based on evidence from the text and are empowered to feel that their opinions are valuable. This literacy discourse would later help me think about similar sorts of conversations in my mathematics classes.

The New Kid Gets Introduced to the "Real World"

In the fall of 1990, I began a "real job," meaning job security, health benefits, and a more generous wage. It also meant coming face to face with "the system" and "the way we've always done it." Here, the innovative ideas I thrived on in math and language arts were viewed skeptically; as merely another swing in the proverbial pendulum. Theoretically, I was encouraged to use my professional judgement, but realistically, I felt a great tension to conform and to "get those kids ready" for the standardized tests. Being told, "the kids need two dittos every night for practice," seemed laughable, but it was a sincere expectation. Even as I attempted to stand my ground and argue that I disagreed, the uncertainty often tugged at me, "Maybe I really don't know what I'm doing."

I got married three weeks into the school year. This made my first year teaching sixth grade language arts to my homeroom students and mathematics to all three sixth grade classes, to a large extent, a game of survival. But, as the year progressed, I felt confident that I was beginning to infuse my beliefs into my curriculum to move it toward what I envisioned to be "my way of teaching." I felt like I did quite a good job my first year, considering everything, and I felt that my teaching was truly reflecting goals I had begun to form in college, while still pacifying other stakeholders such as the other two sixth grade teachers, my principal, and the personnel director who observed my class twice.

Rebirth

During the summer after my first year in sixth grade, I returned to MSU to pursue a Master's degree in Curriculum and Teaching with an emphasis in mathematics. I enrolled in a class that focused on the idea that learning is socially constructed. I was also participating in a six-person study group looking carefully at the Professional Teaching Standards and at the Professional Curriculum Standards, published by the National Council for Teachers of Mathematics. This combination brought me to one of ***the ah-ha*** *experiences that changes your life forever. Sitting and talking with other math* ***teachers*** *about their classrooms, I was listening to one teacher explain how he "showed"* ***his*** *students why this works and he "showed" his students why that works and I sat there* ***feeling*** *very uncomfortable with what he was saying. Slowly, a pit began to form in my* ***stomach*** *as I thought about my "Innovative! Hands-on! Conceptual! Math class" and* ***how*** *I was manipulating every encounter with students' thinking about math! I realized I* ***was*** *missing this huge piece, this huge component! I thought "I've been making it too* ***easy*** *for them." Rather than give them a problem and have them work on it, I was saying* ***to*** *my students, "Here is the problem; do A, B, and C, and then tell me what you find* ***out.*** *" So, if they did A, B, and C, they'd all find out the same thing. I was* ***showing*** *them* ***how*** *it worked, not engaging them in discovery of it. I was* ***explaining*** *why patterns and* ***formulas*** *worked, not trusting them and valuing their ideas enough to let go and let them* ***try*** *to figure it out; to construct for themselves as we construct meaning together. I had* ***been*** *hanging on to my traditional ideas about control and direction, and stuffing them* ***into*** *new wrappings.* ***And nobody could have told me that.... I had to hit it head on for myself for it to mean anything to me.***

Learning in Good Company

As an offshoot of that intimate group of six teachers, struggling heart and soul to ***make*** *sense of their ideas about what's important, I became part of a math study group; a* ***group*** *of experienced teachers originally brought together as a research project that* ***would*** *look at how teachers can use hypermedia to learn about their own practice. The* ***LMT*** *Group has evolved into a support group in which to vent, to brainstorm, to provide* ***encouragement.*** *It has increased my sense of professionalism and has verified for me* ***that*** *any teacher willing to work hard at it can become incredibly insightful and smart* ***about*** *what they do. The research project has evolved right along with the group. The*

report title, "Learning in Good Company" reflects our dual agendas of learning and mutual support. The group provides honest, heartfelt compassion and inspiration, while pushing us to ask hard, sometimes uncomfortable questions.

My questions seem to center around my role in the classroom, and how my use of discourse and inquiry helps students to gain power and direction in their own learning. I have anecdotal records on my students in both language arts and math, and dialogue journals I keep with my class. There are numerous other "pieces" of my classroom that I think can serve as windows to students' thinking.

Even the forms of assessment and opportunities for student feedback and reflection provide valuable information as to how students are making sense and to what extent they are "owning" their own learning. For example, last year I was looking at what kids wrote about what was helpful, what was not helpful. Several times I sat down and went through their writing just making notes. Then I'd sit down a couple weeks later and do it again to see if any other things come out. The time that I did this most recently it hit me that a lot of things that they said are very helpful. They wrote about things that they really liked--things that were different--not what we do routinely every day. A lot of them wrote about the day we put together a three dimensional star. Reading this, I felt frustrated. All this work I'm putting into changing my teaching, I really believe in it, but this is not a "make and take" math class!

*I tried to think about well, if this is bothering me what are some things that I could do? I thought, remember when **you** were in sixth grade; what was fun and important to you? I kept thinking, what are some ways that I can make a memory for these kids because I was feeling frustrated that I wasn't doing the fun stuff that other teachers are doing. Thinking back to my own grade school days, I didn't remember sitting in science class, I remembered the field trips and the fun things. I kept asking myself, What am I going to do? I don't want to be cutesy either! I don't want to be cutesy because then you spend all your time on that and don't get to the meat of things.*

*The second time through their writing it hit me that they **did** realize that what we **had** been doing every day was different, very different from what math was like for them **before**. When I went through their writing again, I saw that they listed these activities, **but** then they also listed things like agreeing and disagreeing and discussing it and **explaining** to other people. Even kids who were not the ones who were explaining at the **board**, wrote "I like the technique, "t-e-k-n-i-k-s!" The lower ability kids mentioned they*

liked the stars and they liked to explore calculators, but they also mentioned the technique. And so, the first time I went through these comments I was surprised about all of these cutesy things that I didn't give two thoughts to. The second time I went through, though they really couldn't pinpoint the activity, I saw that they knew the format was different. I thought, ***that's*** *what they're going to remember from sixth grade math. That star is going to get crunched and it will probably never get home in one piece, but what they'll remember is that* ***this class is different*** *and maybe it will affect them in the future.*

The Roots of Desire

This desire I have for my students to be empowered and to have self-worth and confidence, to feel like they contribute to the whole, seems to come from both what I experienced (belonging) and from what I didn't experience (feeling valued as a thoughtful learner). I suppose my ideal classroom is one where the kids have a chance to think mathematically and have ownership of their ideas and feel empowered and in control over deciding what makes sense and what doesn't. Even at the end of the school year, I still had several kids who said, "You never told us if we were right or wrong." And there were a few students who were really bothered. For them, what makes something valid should still be decided by the teacher because they think "we're not smart enough to know." But most kids didn't feel that way. I guess the ideal class would be where everybody felt confident and trusted themselves to be able to make sense.

For myself, right now, I think I'm a really good math student because I think math will make sense. That might be a blind faith, but I believe it ***should*** *make sense and I have the confidence that if it doesn't make sense I should be able to figure it out if I can just backtrack and think about what I know. That doesn't always happen, though. I have a folder full of problems that I haven't been able to connect with yet.*

It would be nice to have kids come forward, not so frozen in fear that the answer they write down is going to be the wrong one. Helping them shift their attitude toward seeing problem solving as a process of successive approximations, checking, and proof, would help realize that ideal.

"I know now that I can't do this alone."

There are many teachers who would sit here and think, "Why are you doing this?" I am always running out the door at school saying, "Bye, I can't talk today! I've got my

class." Other teachers will say, "You're ***still*** *taking that class? That is a long class!" And I'll explain "It's a kind of study group, you know, we get together and talk about our teaching." They just say, "Oh."*

Sometimes, my husband says, "Aren't you done with that group yet?" I say, "No, it is important for me to do this." One of the things I have learned is the simple but critical lesson: "I can't do this alone."

A Teacher, A Researcher, And A Method Of Inquiry

In what follows I describe the methodological perspective and techniques that guided this study. This description provides an overview of what Lisa and I wanted to learn, why we wanted to pursue this inquiry and how we planned our work.

A Web of Questions

Throughout my graduate studies, as I criss-crossed a territory of instructional design, educational technology, consultation, and educational psychology, my web of questions, born of my own experience in schools, has evolved. In what ways do teachers learn from their experience in the classroom? What do they learn? How is this knowledge held and used in their work? How might they (and I) continue to grow as learning and developing educators in the context of their own classrooms? How can technology help with this work?

When I began to plan for my doctoral dissertation, two goals were clear to me. First, I wanted to pursue an inquiry rooted in the ongoing work of a classroom teacher. While I hold a particular set of research questions about teacher learning and the use of multimedia technology in support of professional development, I wanted the study to emerge from a teacher's queries about her practice. It was important to me that we find a question that would further both the teacher's own learning about her practice and my learning about how teachers learn from their experiences. In this sense, I knew that this research project could be--should be--a kind of intervention study, that engaging in the study would have a constructive impact on the teacher's practice, as well as offer insight to the field of educational research. Achieving this goal meant that I would probably need to already know this teacher so that together we could frame an interesting research question in the context of her practice.

I also wanted to design a study that involved the kind of work I plan to continue doing as an educational researcher and a teacher educator. Specifically, I knew I wanted to use the dissertation project as an opportunity to learn how to do a kind of educational research, a kind of collaborative work that is called for in the literature that is neither easy or obvious how to begin and sustain. I was aware that creating new roles for teachers and researchers would be exciting and problematic. The study had to focus not just on the substantive topics of teacher learning; it had to also focus on learning more about the kind of interactional dynamics involved in working closely and mutually with teachers--a topic I didn't want to take as fully understood.

My story, my hunger, and my questions eventually led me to the work that serves as the basis for this dissertation about a teacher's efforts to engage in a new kind of professional development strikingly different from more familiar forms of inservice training.

Mustering Resources

At the end of our final IMT meeting of our first year, I did not recognize in the moment that Lisa's parting comments began the grounded inquiry for my research work. As she was leaving the meeting, Lisa stopped to tell me that she had started thinking about next school year and she was concerned by the warnings from other teachers in her school: next year's sixth graders are a "wild bunch." Lisa said she was thinking that videotaping her class and watching the tape would help her figure out how to deal with this notorious group.

At the time of this brief conversation, I was pleased that Lisa wanted to pursue the option of video documentation. In my mindset as a research assistant, her comments suggested a commitment to the IMT research project and interesting possibilities for our work at the NCRTL in the fall. I was excited about the opportunity to observe her class, and I was curious about how videotaping might be helpful to her.

A month later, I came to recognize Lisa's comments and request for help with videotapes as an opportunity for my learning as a researcher. During June, 1992, with the help of lengthy conversations with my colleagues, I explored the multiple contexts and

issues embedded in the work of the IMT group. I was looking for connections and questions in the service of my learning goals: to work with a classroom teacher in the context of her ongoing practice and to learn about collaborative inquiry. In describing some early interests, I remembered my parting conversation with Lisa and began to see her prospective use of videotape as an authentic context for exploring the use of technologies in support of professional development of experienced teachers.

Creating a Partnership

Over the summer, Lisa and I had a series of conversations in which we explored the idea of working together during the school year. She was struggling with a question about students who weren't key players in the mathematical discourse in class. In a class where a premium is placed on talk—on the ability to express your ideas and the confidence needed to offer ideas to peers—Lisa kept wondering, What do the *silent ones* take from all this? How do the discussions influence their self-image as mathematicians? The stage was set for a collaborative inquiry with mutual interests at its center.

Looking back, I understand that getting to know Lisa meant becoming a part of the interconnected contexts that influence her sensemaking about teaching. It was important for me to know her students, to have my own relationship with them in order to hear Lisa's descriptions and be able to respond from my own knowledge of the child or group of children. I thought about my relationship with the students as being somewhere between the in-depth personal connection Lisa has with them every school day and the

distant, polite manner of interaction many children have with adult professionals that move in and out of their classroom. I wanted to be able to hear the children in ways helpful to understanding Lisa's stories of events that would transpire when I wasn't there.

As I struggled to define and attend to my naturally fitting place on the "participant-observer continuum" (Bogdan & Bilken, 1982) in Lisa's classroom, I realized the same was true in relation to her principal and faculty colleagues. When I listened to Lisa tell stories in the IMT group I had a more connected way of listening because I had met her principal and Melanie, the fifth grade teacher. I could create stronger images because I was developing a relationship of my own, different from Lisa's, with these students, that principal, those colleagues. As well, I was developing a feeling for Lisa's sense of her relationships in this school community.

A Week of Videotaping

Following my initial experiences with the children[4], Lisa and I planned for our initial focused conversation, a week of videotaping in her homeroom mathematics class, and my part in helping her interview a small group of her students for Lisa's university class project.

I videotaped the math class four days during the week of November 30th. I kept my focus on recording the discourse among the students as they explored ways to

[4] In November, 1992, I visited with the children in Lisa's sixth-grade class. Together, Lisa and I described our research project to them. Also, I accompanied the class on an all day field trip to the local nature center.

represent and explain decimals. In talking with Lisa the week before there were at least two concerns she was trying to keep in mind as she planned. She was ready to move on from the topic of decimals, but was feeling uncertain about the students' understanding. We spent a good deal of time after the Wednesday field trip trying to figure out what to do next. Lisa was puzzled. She was thinking she wanted to move on from decimals; that they had now worked with several models; that she felt that they had spent sufficient time on it and many kids in the class seemd to have a handle on it. And yet, she still felt unsettled. She was concerned about those who didn't seem confident in what they were doing or did not have clear ways of explaining what they were doing. Lisa was hesitant. It wasn't clear to her that she should move on. At the same time, it wasn't clear to her what she should do next. We generated a couple of options:

1) to continue with their discussion about number sentences equal to 1.019 (e.g., .500 + .519 = 1.019) or
2) to do a comparison problem that gets at the concept that decimals are between 0 and 1 (e.g., 0.515 <, >, or = 0).

Lisa decided she wanted an assessment of what her students understood about decimals. In addition to a mathematics assessment, she also wanted to pursue her broader inquiry: Is this kind of teaching good *for all students*? What is the impact of this kind of classroom culture on the quiet ones?

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In planning the coming week, Lisa integrated these broader questions into the students' continued work on decimals. She planned to have her students describe a math class or a math routine from a year in the past—either the 5th, 4th, or 3rd grade. She wanted them to recall and reflect on one of those years because they were then beginning to do what she called "higher thinking" in mathematics. She planned a set of instructions and questions to guide their autobiographical writing. They were to choose a math class day from an earlier year and describe what the teacher did and what the students did. If they couldn't remember a particular day, they were to describe the typical math learning routines in as much detail as possible. Also, each would describe himself or herself as a math student back then: How would a classmate describe you? How would your teacher describe you? Her intent was to ask a similar set of questions later in the week--a parallel set of questions about this year's math class. When we talked about this on Wednesday, Lisa explained that she wanted to have six target students whom she had identified for her own project write about themselves as learners, but she was puzzling about how to do this without pulling the six students out of the larger group and drawing unwanted attention to them. I suggested that she have *all* the students do the writing as part of the school day. She would get the writing from the six target students, but we would also get reflective writing from everyone else to permit looking for comparisons or patterns. Additionally, everyone would feel part of the project with no singling out of the target students. Then we hit on the idea of designing an interview with the target kids to get a deeper, richer

picture of their self images as math learners. We agreed that it would be helpful for me to have these interview conversations with the six students. The students were coming to know me and to see my presence as part of their year and they might be able to have safer and perhaps more candid conversations with me than with their teacher directly. Together, Lisa and I drafted a set of questions and scheduled these conversations to follow my taping of their math class (see Figure 1).

November/December 1992						
		Initial interview 24 with Lisa	Field trip to 25 nature center	Thanksgiving Holiday Weekend		
	Videotaping in Lisa's Math 30 Class	Videotaping in Lisa's Math 1 Class	Videotaping in Lisa's Math 2 Class	Videotaping in Lisa's Math 3 Class	4	
	7	8	Viewing session with Lisa after 9 school	10	11	
	Viewing session with Lisa after 14 school	15	16	IMT Meeting Lisa share her 17 videotape	18	

Figure 1. Calendar of Early Events in the Project

Notes on the Week

I present here a set of brief field notes and an edited excerpt from my journal entry for December 2, 1992. My aim is twofold: 1) to provide an overview of the activities and mathematical foci of the class during the week we gathered video records for Lisa to use, and 2) to provide a sense of the kind of mathematical community Lisa was working to

foster, one that emphasizes student participation in shaping and constructing the curriculum.

Monday, November 30, 1992
Lisa opened the math class with a conversation in which she and I together talked with the sixth graders about our "video project" one more time. We explained that I would be attending their math class all week and gave the students an opportunity to ask questions of both of us. They had some interesting questions about whether or not I was there to grade Mrs. Pasek and when would they get to see the tapes. Lisa then moved the discussion into the reflective writing activity we had discussed the week before. She invited the students to "take a walk down memory lane" and to write about a memory they have from one of their past math classes. Next, Lisa directed the class back to the problem they began discussing last week, before the Thanksgiving break: *Make number sentences that equal 1.019*, but then she quickly changed direction. In introducing the class to Misty, a new student who had arrived that morning, Lisa abandoned the math problem and continued her inquiry into the children's perceptions of their math class. She decided to use Misty's[5] arrival as a natural opportunity for the students to reflect collectively, for themselves and for her, on what their math class is like and how they understand their participation in it.

Tuesday, December 1, 1992
Picking up with yesterday's reflective writing activity, Lisa spent some time listening to stories about math classes of the past which the students had finished for homework. Reading aloud was voluntary. We heard from an even mix of boys and girls but, well into the sharing time, it was clear that the stories we were hearing were all positive tales of experience. I noted in my journal:

I wonder how hearing several students read success stories where they viewed themselves as good math students and thought others (including the teacher) viewed them as good in math might keep someone whose story was not so successful from ever sharing their uncertainty and struggle in math class? Did anyone write such a story?

After the stories, Lisa directed the class's attention to a claim that their classmate, Mike, had posed to her before class. Playing around with his

[5] All children's names used are pseudonyms.

calculator, he tried to solve the problem 2.99 + ? = 3.000, without putting a number in the thousandths place. "You can't do it!" announced Mike with pride. What he kept failing to include in his announcement was that you can't do it without using the thousandths place. Lisa made time and space for Mike to share his exploration because she was excited about Mike's independent investigation and she thought his thinking would provoke discussion among his peers. Indeed, the students engaged in a lengthy discussion about whether or not there could be *one* right answer to this problem.

In the last part of the hour, Lisa asked the class if they had done all that was interesting with the task of making number sentences equal to 1.019? Two boys went to the board and generated a problem where both addends were less than one, or as they explained, "no wholes". Most of their classmates seemed to know what they meant and agreed that no one had yet generated such a problem. This led to a discussion about what happens when you carry and you end up with a whole number. They thought it was a different and important idea.

Wednesday, December 2, 1992

Lisa and I had a brief conversation before the class started. She seemed very excited about what she had seen in the videotape of Monday's discussion.[6] She was surprised by what she heard the students saying when she revisited it. Specifically, she talked about Pedro's comments--crossing out the 9s and making them 10s--it was now a bigger number--299-->21010; it has more digits. At the time she thought that he was kidding; how could he really think that? When she looked at the tape, it triggered a response she wished she had made in conversation with him. She named another example that suggested the same thing, that by going back and looking again, she could hear differently or see more in what they were saying which suggested other things she might have said back to them.

She was excited about watching the videotape. I asked her if she took notes while she watched. My asking felt like a request and she squirmed and said "Oh, well, no." I heard myself say, "Well that's O.K.; I know we are going to talk about it." But actually, I *do* want her to take notes. Thinking about it now, I need to specifically request that she keep notes as she watches the tapes. In fact, I may e-mail her to suggest just that. I do think it is important that she take notes on this--that she record this, not

[6] Lisa had watched the videotape of Monday's mathematics class at home on her own.

only because of the "data collection" frenzy that I'm in but also because the writing is a tool in her thinking and she can talk from that when we get together. At the same time, I am constantly sensitive to how much I am asking her to do. I need to trust a little more that it is going to require some investment on her part and I need to push that and see how it goes. She seems willing--motivated. I need to trust the interest she has expressed in doing this work.

The students started to settle into the classroom and Lisa continued to talk and describe what she was planning to do in class. She was going to let go of the 1.019 problems and I acknowledged that from her e-mail message last night. I added that I liked the idea of the problem space she was going to provide—where they could write additional problems and that I sensed she was really ready to move on. She said yes, she wanted to do the 0 is <, >, = .515—a problem she had given another class last week. This problem had come up a couple of times as an option or next step and one I thought would be really interesting. She had been interested in the conversation with the first group she observed tackling this problem and so she was curious about how this group might work. I readily told Lisa that I thought is would be a good move. We had talked about such problem forms earlier, agreeing that they might provide for a lot of rich discussion that gets at their understanding of the relationship of decimals to 0 and 1.

Lisa started class by explaining how to use the large sheet of paper that was hanging at the front of the room, that it was a place to write the additional equations they had come up with = 1.019. She explained that she wanted to get into something else but knew that there was always good stuff that came later as kids continued to work with the math ideas and she didn't want to loose any of that and they could use this as a place to record their ideas and have classmates discuss them as they went along. It was a nice way of acknowledging the work that they are doing and not calling a premature stop to their thinking, but also pushing them forward and redirecting where she wants the class to go. The kids seemed quite fine with this and I even had the sense that they may have done this before or something like it; they seemed familiar with it. One student raised her hand and confirmed that they were to sign their name next to their equation and Lisa said, "Yes, that is very important so that you know whose problem it is and then you know who to go and talk to about the problem."

With that established, she announced that she wanted to give them a new problem and she set the context by explaining that a problem had come up in a quiz from a class last year. She said that she was so interested in the

way last year's class had worked on the problem—the controversy that it raised and the discussions that they had—and she was curious about what *this* class might think about the problem and whether they too would have a debate. So she wrote on the board <,>,= and explained that it was this section of the test that had the problem:

0 _____ .515

She said they needed to decide which symbol, <, >, or =, to put in the blank space. At that point she asked them to first write in their own math journal what they thought, what their argument would be for the answer and then they would come together as a whole class and discuss it. After about 5 minutes of very quiet writing time, the students began to talk to each other. Mike and Susan, two bright and talkative leaders in the class, were figuring it out for themselves, using a number line. Once they quickly got a handle on it—and I would be interested in looking at the shorthand they were working with (their language)—they then turned to explain it to Shari who was just a half step behind them. She was working on her own number line in her own notebook but needed more time and some repeating. They also turned to Doug, the fourth person at the table, who was pretty disconnected and didn't have anything on his paper; he was looking all around the room at what else was going on. Mike was very good about drawing him in and saying, "O.K., now draw a number line." He was telling him exactly what to put on his paper. It struck me that Doug was having a very difficult time attending to the discussion that Mike was trying to have with him.

It wasn't too long after that when Lisa asked for volunteers to start the discussion at the board and others to present some of their ideas. Someone explained that .515 is *something* so it has to be greater that 0 which is *nothing*. The student said it in a confused way and Lisa asked for someone else to explain what he meant. A boy repeated it and tried to clarify it and then Lisa asks for a model: "Is there anyone who used a model to show what they are talking about?" At that point, Susan and Mike went to the board and began to draw their number line which I had watched them draw in the small group. Susan dramatically and emphatically explained to the class what Mike is drawing....

I include this excerpt from my journal entry for December 2, 1992, in part because the activity of this class became the focus Lisa's conversation when she first shared a videotape of her classroom in a subsequent IMT group meeting. It is important to note that the journal reflects a different kind of teacher-student and student-student interaction than is typical in most elementary math lessons in American public schools. Still, there were dramatic individual differences among the children in how apparently engaged they were in the discourse opportunities that they pursued or let pass, and in the roles they occupied--from math tutor, to graphic artist, to "explainer" to the class, to silent partner.

In the next section, I describe how Lisa and I explored questions about her use of the videotapes to study the discourse in her mathematics class, her role with the students, and her understanding of her own pedagogy. I connect our exploration to the ethnographic theories and methods that guided our work.

A Method Of Inquiry: Investigating Experience As We Live It

I borrow directly from Max Van Manen (1990) the phrases: *Investigating Experience as We Live It, Gathering the Material of Lived Experience, and Reflecting on the Materials of Lived Experience* as a frame for talking about data collection and analysis in this study. Van Manen's writing has helped me to think deeply about the way the language we use to describe research methods is rooted in an experimental tradition--with the lives of both subjects and research analysts separated from the focus of the question. Vygotsky's (1986) teaching about the powerful relationship between thought

and language urges me to pursue new language for the way I think about my work. Lakoff and Johnson (1980) teach me about the power of metaphor in shaping our conceptual understanding. Was I "collecting" bits of information from Lisa or even with Lisa? Struggling with this language is not just interesting; it seems necessary to continue learning a practice that is fundamentally different from traditional research on teaching. The language I use is not just important for representing my ideas to others, it is fundamental to the development of my own understanding.

It seems more fitting to describe what I did in conducting this study as gathering materials of our lived experience. We generated and gathered together representations of our conversations, our individual reflections, our interactions with each other and related groups. And while still gathering, we reflected on these materials to make sense of our experience and to connect it to our understandings of ideas as well as others' understanding and representations.

Jean Clandinin and Michael Connelly have also contributed to my thinking about aquiring another discourse for describing this work. For example, in their chapter in the Handbook on Qualitative Research (Lincoln & Denzin, 1994), Personal Experience Methods, they describe data as "field texts":

> They are texts created by participants and researchers to represent aspects of field experience. Some documents that eventually became field text may have been created prior to the inquiry, or even during the inquiry but for a different purpose. Such documents became field texts when they became relevant to the inquiry...How we get from field to field texts is a critical matter in personal experience methods. Central to the creation of field texts is the relationship of researcher to participant.

Gathering the Materials of Lived Experience

Grounded in the stance that researching experience means at once living and studying the questions of an inquiry, the primary materials of this study are the conversations I had with Lisa. This work included conversations about first-hand experiences (e.g., conversations about issues in our respective practices of teaching and research; conversations stimulated by videotape representations of Lisa's classroom). Other conversations were more reflective in nature (e.g., looking back at the experience of watching tape or sharing it with others; revisiting conversations we each had with other colleagues). In addition to conversation, our inquiry took the form of various written materials: journals, notes, conceptual memos, and course and conference papers. A third category of materials is videotapes: eleven videotapes of Lisa's classroom, three tapes of our reflective conversations, and one tape of our talking about our work in a preservice education seminar.

It does not seem feasible or productive to attempt a listing of the conversations I have had with Lisa over the course of this project. The number is large but, more importantly, it would reduce the strong sense in which our work can be characterized as an ongoing conversation in the context of living the inquiry. Instead, I think it is important to organize and reflect on the various settings in which Lisa and I talked together and the kinds of conversations in which we were engaged across the year. Our conversations took place in three general contexts: planned meetings, telephone

conversations, electronic mail conversations. The purposes of these conversations can be distinguished as preparatory or investigative and reflective, although almost every conversation involved each.

In addition to numerous conversations, Lisa and I had many opportunities to observe each other in a range of professional settings. How we presented ourselves to others in the presence of one another was a source of information about our relationship, not only for the work of the relationship, but also our sensemaking about our collaborative work. Hammersley and Atkinson (1983) caution ethnographers about the influence of the researcher's presence on participant's unsolicited accounts and importance of considering the audience to which statements are offered. The reciprocity of this influence is important as well. I found it helpful to attend to the various ways Lisa described her practice and our work to others when I was with her. The occasions, for example, when she explained to an MSU undergraduate in a class session we visited or to a mother volunteering in her classroom, that we were working together to learn about the discourse in her mathematics class, reassured me that we shared, at some level, the qualitative research goal: to understand (Bogdan & Bilken, 1982). I was always wary that the goal of judgement, a commonly held perception of research and a traditional purpose for classroom observation, was influencing my interactions with Lisa. Therefore, I would listen particularly closely to her descriptions and be as explicit with her as seemed authentic about my worries. I often used the image of us each as learners: one a learner of mathematics teaching, the other of qualitative research, to counter any concerns about my

judging or assessing her competence as a teacher. And this is where the reciprocity I mentioned above is important.

I believe Lisa continued to learn about my understanding of our experience when I spoke about it in more "public" settings. I had several opportunities to present our work in progress at national and international conferences.[7] For each presentation, Lisa and I met to review and discuss the ideas and the data I would be sharing. In these preparatory meetings, I would share my academic and personal thinking about the importance of the ideas and the purposes of our collaborative work. During such a meeting, in preparation for my presentation at the urban ethnography forum at the University of Pennsylvania, in particular, Lisa commented that she was gaining a deeper understanding of the links between my own history as a classroom teacher and the questions we were pursuing in the study.

I observed, early on, that Lisa and I both avoided detailed conversations about our collaborations in the context of the IMT meetings. Our perception, which we only discovered we shared upon reflection, was that it may have violated the unspoken norms within the group for sharing of the resources of the group. Over time, I gained an understanding of Lisa's characterization of our relationship to other educators *outside* the IMT group. On separate occasions, Lisa introduced me to her principal and a district administrator, to fellow teachers at her school, and to colleagues in her masters program.

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[7] My earliest presentation was in a data analysis session at the annual meeting of the Urban Ethnography Forum at the University of Pennsylvania, 1993. I also presented our early work at the meeting of the International Study Association on Teacher Thinking in Goteberg, Sweden, 1993. Lisa and I presented our work together at the annual meeting of the American Educational Research Association, Atlanta, 1994.

Only in the instance of meeting her administrators did she introduce me as a researcher. In all other occasions, I was "a friend from MSU." As an aside in a conversation the summer following our year together, Lisa explained that she consciously avoids telling people that I am a researcher or that what we are doing is a research study, because such vocabulary carries "baggage" that I am "studying her" and distorts the purposes of our work as we understand them.

It is clear to me that my work with Lisa in this study is a beginning example of the kind of collaboration called for in the reforms of educational research and the work I to which I aspire as a researcher. We both took seriously the complexity of a participant/observer role—herein lies our collaboration—enabling us both to engage, for distinct purposes, in researching lived experience (Van Manen, 1990).

Reflecting on the Materials of Lived Experience

The most difficult aspect of this work for me, both personally and professionally, has been the messiness of it all. No matter how many accounts by other human science researchers I read, from descriptions of their own studies to methodological guidelines, the work has felt uncomfortable and uncertain to live it. Early in the study, I read numerous narrative accounts of experience (e.g. Freedman, 1984; Rose, 1990; Grant, 1989; Paley, 1992; McConaghy, 1990). In addition to the core references that introduced me to the theory and method of qualitative work, I sought out researchers conducting and

reflecting on qualitative techniques (Lincoln and Denzin, 1994; Krieger, 1991; Clandinin & Connelly, 1988 ; Polkinghorne, 1988; Van Manen, 1990).

A key device in my effort to study, understand, and represent my work has been the book outline. My numerous attempts at outlining a book, or narrative account of my year with Lisa, was the primary structure by which I framed my working assertions and also revised them continually throughout the study. The movement from the outline to the text to the materials and back to the outline again is a continual process, reflective of the iterative nature of analysis in qualitative work (Bogdan & Biklen, 1982; Hammersley and Atkinson, 1983). There comes a sense of change and maturity of the work through this recursive process. It is interesting and perhaps helpful to think about this movement as similar to the way we lived our experience: deeply immersed in the activity and then stepping back or to the side, sometimes just briefly, sometimes for days, to assess and make sense of "what the parts have in common" (Bateson, 1990, p.15).

My iterative working from materials to outline to text and back again focused largely on the use of audiotapes, transcripts, and journals to support or disconfirm and "triangulate" (Gordon, 1980) the inferences generated in my study of the experience. Reflecting on this process made visible a triangulation of materials, as well as a use of "methodological triangulation" (Erlandson, et al. 1993). As an example of triangulation of materials, in Chapter Three to follow, I draw heavily on the audiotape/transcript of Lisa's sharing of tape in an IMT meeting, the audiotape of our telephone conversation

following the meeting, my field texts, and Lisa's journal to pursue multiple reflections on the experience and inform my research question. As an instance of methodological triangulation, I point to the analysis presented in Chapter Five. This work shows my continued study of audiotape documentation of IMT meetings in which Lisa examined her practice, together with her own documentation of her understanding in her journal, and my participation in her classroom, triangulated with conversations with another IMT member and follow up interviews with Lisa about my working assertions.

Additionally, Chapter Five presents analysis that approaches "theoretical triangulation" (Erlandson et al., 1993). Because the data materials surrounding the IMT meeting in which Lisa shared a videotape of her teaching are central to this study, they have been reviewed multiple times, through distinctly different theoretical lenses. In an early stage of my study, I examined the materials of the December 17th IMT meeting in terms of the relational issues influencing the interactions between and among Lisa and the IMT members. The thematic framework that emerged from this analysis was informed by feminist theory and conceptual work on the aspects of safety, trust, and care in teachers' collegial relations (Belenky, Clinchy, Goldberger, & Tarule, 1993; Rogers, 1992; Noddings, 1984; Coles, 1989; Clandinin et al, 1993; Giddens, 1990).

This same set of materials was studied from a sociolinguistic perspective, guided by the question, what is happening in the conversation on December 17th? Drawing on the work of (Goffman, 1959; 1967; Gumperz, 1982; Coultard, 1992; Tannen, 1989) I analyzed the conversational rights and duties that directed the group's interactions around

Lisa's videotape of practice. These analyses, triangulated with my analysis of Lisa's reflections, a study of the materials as a reflection-on-reflection-in-action (Schon, 1987; 1991) constitutes a convergence of ideas resulting in this thesis.

Interpretation as Conversation

I want to underscore the influence of several authentic occasions for reflection and sensemaking on my learning of qualitiative research work. I will describe my experience with and valuing of conversations about my inquiry with a range of conversational partners. Just as Lisa and the IMT teachers have tried to articulate the "intellectual work" in talking about their practices with colleagues, much of the interpretive work I did in this study took place in conversation. About collaborative analysis, Van Manen writes:

> Whether formal or informal, what one seeks in a conversational relation with others is a common orientation to the notion or the phenomenon that one is studying. Gadamer (1975) describes the method of a conversational relation as "the art of testing" (p.330). And the art of testing consists in the art of questioning—meaning "to lay open, to place in the open" the subject matter of the conversation. And so the collaborative activity of discussing and testing a research text should not be a situation wherein the discussants of the text try to outwit the author or the other partners of the discussion group by polemical debate or argumentative confrontation. ...the structure of the conversational relation much more resembles the dialogic relation of what Socrates called the situation of "talking together like friends." Friends do not try to make the other weak; in contrast, friends aim to bring out strength. Similarly, the participants of a human science dialogue try to strengthen what is weak in a human science text. They do this by trying to formulate the underlying themes or meanings that inhere in the text or that still inhere in the phenomenon, thus allowing the author to see the limits of his or her present vision and to transcend those limits (cf. McHugh, et al., 1974) (Van Manen, 1990).

For the purposes of illuminating my methodological approach to this study, I think about a parallel to the way in which Lisa and I created a "conversational workspace"[8] for making sense of her experience in the classroom and in collegial settings where she was learning to talk about her practice. Similarly, working with Dr. Christopher Clark as my advisor created for me an additional "conversational workspace" in which to make sense of my collaborations with Lisa, moving between the IMT group and our inquiry.

Chris and I met nearly every week during the work of this dissertation project. Our collegial work, his guiding my learning of a new practice, created several important learning experiences for me. First, it gave me another set of experiences in which I could connect my ideas about Lisa's learning with my own. Van Manen (1990) writes that "we gather other people's experiences because they allow us to become more experienced ourselves...." (p. 62). Second, I learned a particularly valuable lesson in my development as a collaborating researcher. I learned first hand that the analysis—the sense making of one's independent study—cannot be done in isolation. I recognized in my own experience that I was still carrying a image of "doing analysis work" that aligns more with experimental traditions where the researcher singlehandedly applies a set of prescribed strategies, deals with the data, and comes back to report the findings. I did spend many hours alone with the materials of our work. But it was in my conversations with several committee members and colleagues that I did a significant amount of the interpretive work of this study. In conversation I raised questions, I tried out language, I found/fit

[8] See Denyer and Pfeiffer (1996) for their development of this sociolinguist concept.

connections among ideas; I forced some connections that later—broke. In my explaining and re-explaining, I made sense—and continue to make sense—of my collaborative work with Lisa.

What Have I Learned? How Might I Show Others?

Throughout this project, I have grappled with a set of questions traditionally connected to the completion of a research study. What are the results? Have you finished your analysis? Are you writing yet? When will you be finished? The language and thus, the standpoint of these questions is rooted in research that poses clean questions and produces definitive answers. How do I answer these questions when my project was and continues to be an evolving colleagueship?

If I return to my perspective on learning—always my strongest starting point—then I need to alter the way I conceive of and articulate the closure aspects of my research work. Much as we aim for teachers to *hold open* their questions of practice (e.g., What does it take to facilitate the discourse in my classroom?), the aim of human science research is, in part, to hold open our study of experience and phenomena. My research is my learning—can it ever be finished? So how do I talk about where I am and who I am in my work *thus far*? How do I share what I have learned in this one project that it may contribute to others' research? The first answer is I must continue learning to write about my work.

As Van Manen notes:

> Writing fixes thought on paper. It externalizes what in some sense is internal; it distances us from our immediate lived involvements with the things of our world. As we stare at the paper, and stare at what we have written, our objectified thinking now stares back at us. Thus, writing creates the reflective cognitive stand that generally characterizes the theoretic attitude in the social sciences. The object of human science research is essentially a linguistic project: to make some aspect of our lived world, of our lived experience, reflectively understandable and intelligible (Van Manen, 1990, p.126).

Many scholars have shown by example and by word that "research is the work of writing—writing is its very essence" (Barthes, 1986, p.316). For all the messiness and uncertainty of learning from my inquiry and my struggle to articulate the methodology of this research project, I have developed a deeper understanding that writing is the method. It is in the writing that I think. It is in the writing that I come to understand. (Heilbrun, 1990; Bruner, 1963, 1986; Brande, 1934; Dillard, 1989).

But this text is not the only product of my work. The text is a representation of the work. And the work *is embodied* by those who have lived the experience, reflected on it and crafted a way of sharing it with others. The text then, is one representation of the writer. In producing a text, writes Van Manen (1990):

> ...the writer produces himself or herself. As Sartre might say: the writer is the product of his own product. Writing is a kind of self-making or forming. To write is to measure the depth of things, as well as to come to a sense of one's own depth (p. 126).

I am curious about the ways in which relatively new and tentative moves in educational inquiry toward a relational pedagogy (Kreiger, 1991)—where the researcher is

a product of the research—will shape and reshape the way we think about written texts as the best representation of who we are becoming through our work.

Relatedly, I want to close this chapter with a brief exploratory note about my long term study of this project and, perhaps more importantly, my work as an educator since this project. I believe that time and subsequent new work have informed my analyses and revisions and have shaped my understanding in ways that could not have been anticipated at the time I was designing the study as a doctoral dissertation project.

In the year following my completion of the draft of this thesis I took a full-time teaching position in a sixth grade classroom in an elementary school about 85 miles from the university. The decision to pursue this position was in many ways agonizingly difficult, a time of my greatest professional and personal uncertainty. Nearing completion of the dissertation work and entering the period of transition that moves a doctoral student from intensive study to new work and new status, usually as an assistant professor, I found myself considering very seriously a return to "new work" with former status as an elementary classroom teacher[9]. My decision was influenced by the work of my dissertation project and more so, by my long term involvement with the IMT group. I was not aware, early on, of the ways this decision would influence the revision work I chose to engage concerning the analysis and interpretation of my dissertation project.

When I returned to revising the thesis, six months after beginning my "new" elementary practice, I was struck by two changes that I think are important and

[9] I am grateful to Janet Navarro for sharing with me the phrase, "returning to a place I've never been before" as a way to describe the experience of transforming a teaching practice.

unanticipated methodological outcomes of this work. First, there was a change in my writing voice. I believe that I still write as a researcher, but now with a particular sense of confidence, or more specifically, a sense of connection to practice that secured my confidence in interpreting the study materials. Second, my understanding of my analyses and interpretations has been strengthened by my actual return to a classroom position and moreover, to the culture of teaching. I grapple, whole heartedly, with the questions: Is it necessary to return in order to understand, the longstanding participant/observer dilemma that pushes researchers? Must I *be one* to understand one? I still stand in agreement with the anthropological notion that we can achieve deep understanding of another's experience (Clifford, 1988; Geertz, 1988) without enacting the same experience. Indeed, we know we cannot have the same experience. Still, I am intrigued and excited by the ways my recent experiences have enhanced my understanding of the work I did with Lisa and my serve potentially to shape my subsequent research work as a direct participant/observer in the culture of teaching. And so, my understanding of my work with Lisa continues to grow.

CHAPTER THREE

Learning New Norms For Making Practice Public

"So to use videotape in a way, in a trusting, sharing inquiry, is very different."
Lisa, 1-6-93

For many classroom teachers, responding to curricular and organizational reforms is largely a decision about whether or how to comply with a new mandate handed down from a distant part of the larger system— "the district" or "the state." Sometimes, responding means deciding whether or how to adhere to a new set of guidelines, new instructional materials, new inservice programs, or new committee work. For Lisa Pasek, responding to the reforms is personal.

In Chapter 2, Lisa shared with us highlights and pivotal events that have shaped her view of learning and her view of her teaching. Lisa is in good company with a growing "community" of teachers nationwide who view the call for change as a challenge to craft for themselves professional identities and career paths that are labor intensive to forge and exhausting to sustain. Once introduced to a vision of reform, the greatest challenge may be for teachers to figure out ways to get from here to there, from the familiar world of teaching as they observed it as students, imagined it as teacher candidates in college, and were socialized into it as eager, energentic novices.

Kenneth Bruffee (1993) writes about his own experience with crafting a new sense of identity as an assistant professor, struggling to understand the transition process

students in his freshman English class must make in order to participate successfully in the academic culture to which they arrive from a range of communities. He describes how their difficulties acquiring the language, values, and ways of being "academic" can be understood if framed as a process of acculturation.

Bruffee describes his own participation in a group of fellow faculty members who met to explore strategies for working with their students to show how the collaborative conversation and joint work the group provided a *transitive support community* in which they were able to change their perspectives and practices. Moreover, the group provided a model of the kind of conversations they needed to foster among their students in order to provide the transitional support needed for them to become active, learning members of the academic community. It is in the "*boundary conversations*", Bruffee suggests, that students move from one knowledge community to another, acquiring the necessary understanding and skill to authentically participate in the definitive ways of the new community. Part of the power, I think, in Bruffee's contribution to this study is the idea that the transitional process is not just a matter of shifting one's participation to a new place and a new group. Rather, it is a transformative process that involves learning and it is the work of a transitional community to work at the knowledge boundaries of the both/all communities that converge in the process. In Bruffee's words:

> What we have to do, it appears, is to organize or join a temporary transition or support group on the way to our goal, as we undergo the trials of changing allegiance from one community to another. The agenda of this transition group is to provide an arena for conversation and to sustain us while we learn the language, mores, and values of the community we are trying to join (1993, p.20.)

> This transitional process of translation, this willingness to learn the elements of new languages and gain new expertise, is the most important skill in the craft of interdependence. It is a willingness to become members of communities we have not belonged to before, by engaging in constructive conversation with others whose background and needs are similar to our own but also different. Reacculturative conversation...combines the power of mutual self-aid help groups with the power of successfully collaborative intellectual work. It integrates the will and the way. ...To be able to engage in constructive reacculturative conversation, however, requires willingness to grant authority to peers, courage to accept the authority granted to one by peers, and skill in the craft of interdependence (1993, p.24).

Using a different set of constructs, linguist James Gee has also addresses the notion of movement between communities and the enculturation process required for participation. Gee (1989) draws a distinction between *primary and secondary discourses*, where the first refers to the "oral mode" (p.5) of enculturation that takes place generally within a family structure and the second refers to "other discourses which crucially involve social institutions beyond the family" (p.5). Gee further differentiates primary and secondary discourses such that the first is acquired "by exposure to models and a process of trial and error, without a process of formal teaching." The second is acquired "by having access to and practice with secondary institutions such as schools, workplaces, stores, government offices, etc." Gee uses these concepts to construct a framework for understanding literacy development in children; he describes children's acquisition of their primary discourse in the home and their learning of a secondary discourse when they enter school. He also likens the acquired discourse to an "*identity kit*" which "comes complete

with the appropriate costume and instructions on how to act and talk so as to take on a particular role that others will recognize" (1989, p1).

Of particular relevance to my analysis of Lisa's work in the IMT group is Gee's argument that learning a secondary discourse enriches and expands a person's social competence. Moreover, he points out, a secondary discourse enables one to reflect upon and critique a discourse previously acquired. Denyer and Florio-Ruane (1995) draw on Gee's ideas to articulate the opportunities teacher education programs might create for teacher candidates "to learn about alternative discourses for teaching or different ways of realizing the teacher's role and her work" (p. 540). These authors worry the problem of balancing a candidate's formal learning of teaching methods with acquisition and internalization through models and guided practice. Similarly, educators concerned with the professional development of reform-oriented teachers—that is, teachers oriented to the alternative discourse of education reform—face the challenge of creating contexts in which practicing teachers can critique their early acquisition of a teaching discourse while acquiring and practicing a new one.

Together, the constructs offered by Bruffee and Gee with the application of some by Denyer and Florio-Ruane create a helpful frame for situating Lisa's efforts to learn to use videotapes of her teaching in representing and examining her work. This chapter centers on Lisa sharing her videotape with her colleagues in the IMT group. By looking closely at her preparation for this event, the activities of the event, and Lisa's reflection on her experience, we have an opportunity to consider what was needed for one teacher to

participate in a transitive support community committed to learning new ways of thinking about, talking about, and doing the work of elementary mathematics teaching.

Lisa's sensemaking of her sharing of videotape, the key event in our research project illuminates ways she was reassured in her efforts to craft a practice responsive to the reforms. My analysis of Lisa's analysis suggests ways of understanding why teachers in pursuit of a new kind of practice and a new kind of intellectual engagement with colleagues around their practices will need to create for themselves new norms of interactions, interactions that hold potential for altering the culture of teaching that currently shapes their work. Lisa's experience in making her practice public through videotape illuminates how creating these norms requires teachers to develop and use a conscious knowledge of the existing culture. They must also develop and use images or beginning experiences with an envision culture. They must stand both in and out of the familiar culture of teaching, drawing on knowledge and skills acquired through their initial socialization into the profession, in order to create and sustain new ways of being in company with other teachers.

Lisa was interested in figuring out how to create and use a learning community of colleagues to support her efforts in learning to teach mathematics, one that included close examination of the activities in her work with students and careful, critical talk about the reasoning behind that work. She was interested in learning how to use videotapes of her own classroom teaching as a tool in conversations with other teachers so that she might get smarter about how to create a mathematical discourse with children that was

meaningful and educative.

The account to follow describes Lisa's efforts to alter her experience of storytelling by adding video images and to explore how conversations with her colleagues might help her improve her teaching. I begin with a description of the portion of the IMT meeting in which Lisa shared her videotape, interrupted by a description of her preparation for that discussion, and followed by an account of her reflections on the experience in the weeks following the meeting.

The remainder of the chapter includes a descriptive analysis of Lisa's reflections on her experience and a sociolinguistic examination of the rights and duties at work in the IMT discussion. Stepping back from the analysis of talk, I discuss the relational context of trust that is needed for Lisa and other reform-oriented teachers to begin altering the rights and duties of teacher interactions in ways that approximate the critical dialogue described in reform literature.

Sharing Her Own Videotape Of Teaching

When Lisa arrived at the conference room inside the College of Education, the regular meeting place for the IMT group, several teachers were engaged in a conversation about their students' ideas about place value. It was December 17, 1992, and the last meeting of the IMT group before the holiday break. Lisa unpacked her grocery bag full of snack foods and added them to the buffet of holiday specialties in the center of the table. Other group members moved in and out of side conversations about current happenings in their classrooms. Then, almost abruptly, the group settled into a conversation with Sheryl, a fourth grade teacher. She was asking several members at one end of the table, "So, [in my class,] we've been doing lots of problems like that, two digit problems. My problem is, where do I go after this? ...If I think they understand [the concept of multiplication] where do I go now? How do I transfer over to the algorithm? *Do* I do that?"

About fifteen minutes into the group's exploration of the difficulty in helping students connect what they know about place value from working with manipulatives (e.g. what the tens mean; what the ones mean) to the algorithm for two-digit multiplication, Lisa entered the conversation. She responded to Sheryl's frustrations with a strong tone of encouragement saying, "Well, I would say, keep with it."

Sheryl asked, "Keep with it?"

Lisa continued, "Keep trying to connect it. I think—keep trying to connect [the

concrete to the algorithm]. Because, well, I brought tape today and my sixth graders had this discussion and nobody could explain—they were showing a multiplication problem—nobody could explain why you have to have a place holder in a two-digit multiplication problem. We can look at it later, but sixth graders who are top notch students are saying, 'Well, you just need a place holder.' I ask, 'Why?' and they say, 'You just do. Or you're going to get the wrong answers.' They really—we never get to it."

I watched closely as Lisa stepped into the discussion and set the stage for sharing a videotape of her own teaching. In this brief exchange, she put on the table the idea that she wanted to show a videotape of her classroom. She did so carefully, not taking the floor from Sheryl nor changing the topic of discussion nor putting herself in a position to show the videotape right then. Rather, she let it be known that she had a videotape of her teaching with her and she suggested that watching it together might be helpful to the group's discussion.

Lisa had told me earlier that she wanted to "ease in" to sharing the tape. She didn't want it to be "Lisa Night." She had explained that she didn't want to show tape first thing because she knew that people would come to the table with concerns and questions and she didn't want to take that time away from them.

Earlier Preparation for Sharing

Lisa and I met in her classroom after school a couple of days before this meeting. There we talked about her expectations for what she might gain from showing her videotape to the IMT group. Lisa likened her image of sharing her videotape with the IMT group to jamming with a group of excellent jazz musicians. Rather than merely telling about her practice, she was looking to share, seeking affirmation, observations, and questions she was sure would push her thinking. She said:

> It's maybe like a sax player or an instrumentalist that practices and practices a certain piece that they really want to excel at or they really want to be able to perform well. So they work really hard on that piece and they perform it and they still want to work to keep it up. But then, they also probably like to get together with a group of other musicians and jam.... So, part of it is, I want to kind of show—and jam. ...[T]he stories are fun to tell and they are fun to listen to and I think the video would provide a way to do that. I'm just really interested in what other people will notice.

We talked about how she was thinking about her selection of a fifteen minute segment of videotape to show to the group. Lisa worked back and forth in her thinking about how much to structure her sharing of tape around a question and how much to explore a piece that seems to have "lots of rich stuff in it." She thought aloud, "Maybe I use the same criteria I use when I think of a mathematical task...I would want to have a question, but one that is open ended enough that it would engage people on different levels."

Lisa considered further why, rather than posing a question, she was interested in what others might notice. In Lisa's words, "there is the value of having people look at

something you think you have a handle on and then a different perspective can kind of blow it wide open for you, too." Lisa continued this line of thinking, explaining that getting different perspectives is "more of what I'm expecting from the group; their questions may peel more layers. I don't know if that would happen the first time; if people will be timid; I kinda don't think they will be."

This same afternoon, Lisa and I watched some videotape together, segments from the third of the four math classes we had recorded a couple of weeks earlier. Lisa had selected these segments by watching the tape on her own at home. As we watched, I prompted Lisa to articulate her reasons for showing these clips to the group:

> Maybe another [reason] I want to share this is because (pause) I can tell stories at the group of what my math class is like and I can listen to other people's stories, but we could all be lying and just telling our perceptions of what happened. AND there are no other models around that I can compare to or get feedback about. There is no one around [here] that would come to me and say, 'that was an interesting question.' Just because of the set up of our system and just not having that kind of support. So part of it is just wanting somebody to say, 'that was a good question.' Or, 'I'm interested in why you did that', because there's no feedback like that [here]. With the stories, they respond to the stories. It's not really—they can't ask me about things that I don't tell them about.

She continued thinking aloud:

> Part of it is—I want—a kind of coming out party. Where you say, 'This is what it really is. Whatever I told you, whatever my perceptions are of it, you know, better than or worse than or more confused than', everything else has been my perceptions of what happens and I want to get (pause) I want to have a feel for someone's input about whether there is a lot of student exchange or there is more teacher exchange than I thought. I want to know where I fit in. I don't know if that's the right way to say it. (pause) It is interesting because when we were watching a tape of Deborah's (Ball) and she cut off a conversation that was going on between

> some students, Kathy said, 'Why did she cut it off? I would have let it go.' And Jane said, sitting right next to her, 'I would have cut it off a lot earlier.'
>
> It was a beauty of a moment because there were two teachers that are professing the same beliefs and the same ideas about how kids' learn and they took very different stands on how that discourse should have been manipulated. And so I'd like to—I suppose it would be the same thing with my example of discourse. There might be people who would say, 'Oh you're—like in their heads they might say, 'Oh you're talking way too much' and somebody else would say, 'you're not directing the kids enough.' Just depending on what they are used to. It's not really finding out if I'm right or wrong, but just kind of getting a feel for who did I agree with more.

As our conversation continued, Lisa and I talked about this notion of assessing where she fit in--who she agreed with--and she explained that knowing how the IMT group works, that even if she showed them a tape that looked like very traditional teaching (e.g., "doing 20 problems out of the back of the book"), she expected the group members would ask her questions about her purposes for doing so, trying to understanding her thinking about her teaching. This understanding of the IMT group assured Lisa that sharing her tape was, as she said, "not threatening...I predict that whatever happens it will be helpful."

Lisa's sense that it would be helpful seems connected to her descriptions of her experience in the group during it's first year together. In interviews during her first year of participation in the IMT group, Lisa used analogies to describe the support she found in the group.

> [T]he intensity of the IMT group and the sense of purpose and renewal I felt made me liken my participation to the spiritual experience of attending church. On Thursday, I make the drive to the university to talk and listen,

> to push and be pushed, and to gain strength in the power of the group. It is this planned and predictable source of affirmation that enabled me to return to my own school and continue pushing [myself] to teach mathematics in new ways. Had I not had this source of support, I worry that I would have become a "lost sheep" (April, 1992).
>
> I was involved in a year long math in-service training sponsored by my school district. This training was conducted concurrently with my participation in the IMT group. This district in-service was an introductory kind of investigation into different ways to teach math. Perhaps, like a recreational raquetball league, these people were satisfied to get together and just hit the ball around for awhile. During IMT meetings, however, I could tell I was in a different league. These people were serious players, fascinated with the foundations of the game they were playing. The members of the IMT group seemed committed to looking beneath the surface and working hard to analyze alternative ways of teaching and learning mathematics (August, 1992).

In Lisa's words, she saw the IMT group as "a predictable source of affirmation,...a source of support" for sustaining herself in the challenge of teaching in new ways. Lisa looked to these "committed" and "serious players" in the game of reform for the analytical help she needed to understand the reform of mathematics teaching and to use her understandings to transform her practice. She trusted these colleagues to help her find her way.

As our planning meeting was winding down, I asked Lisa how she was thinking about setting up the clip for the IMT group, "so that you get something out of it?"

> Well, I know I'm going to get something out of it. That's not even an issue, I don't think. At this point, there are—kind of—different levels. Part of the reason I want to share is to jam—part of it is to share what I'm doing. And part of me wants them to say, 'Yeah, you're OK.' That would reaffirm for me that this *is* part of what other people are thinking of as—

the vision.

> Then there's the level that this was something neat that happened in my classroom and here's the story about it. And then there's the possibility—almost guaranteed—that they will ask me questions and make me think about it in a different way. So already, there are four things, four levels, that don't even include having me have a particular question answered.

Showing and Talking about Practice

Lisa's predictions and thoughts in planning to show her videotape are critical to the analysis that follows. Of particular interest is her thinking about how people will engage and her four levels of purpose for making her practice public. But first, I continue my description of what happened during the IMT meeting on December 17, 1992.

Noting Lisa's move to "ease in", I returned my attention to the discussion at the IMT table. Connecting to Lisa's point that her sixth graders didn't seem to understand the convention for two digit multiplication, Carole, a third grade teacher, was describing her students' struggle to understand the meaning of zero in a multi-digit addition problem. She said:

"See with my *third* graders--I had Jacob saying to me the other day, 'Let's just get rid of this zero. The zero is worth nothing, so when you are adding 245 + 755, you can just drop the 0 and put down the 1.'"

Carole continued to explain that this was the same little boy who, a few weeks earlier, had grappled with the meaning of zero in 6 X 0 = 0. According to Carole, he was

the first in the class to see that zero means nothing in 6 X 0 = 0. The connection Carole was making now, with the help of other IMT members, was that Jacob was trying to use his understanding that zero means nothing in a new mathematical context. Carole was puzzling about how to help him sort out what may seem like conflicting ideas: in one case zero means nothing (6 X 0), but in the addition problem it does mean something (245 + 755 = 1000, not 991).

The group's conversation was interrupted briefly when Kathy, a second grade teacher, arrived and took a seat at the end of the table. Helen redirected the conversation back to Sheryl's algorithm problem, asking her, "So how are you thinking about next steps? The discussion grew more lively as the members continued to investigate the way we teach kids the multiplication algorithm and how little "real sense" it makes to do what we do in multiplying two-digit numbers. Carole commented that the way Sheryl was arguing (see Figure 2) to present it to the kids, to break it apart, actually made more sense than the convention:

A.

$$\begin{array}{r} {}^{3}24 \\ \underline{\times 8} \\ 192 \end{array}$$

The conventional algorithm for multiplying a two-digit number

B.

$$\begin{array}{r} 24 \\ \underline{\times 8} \\ 32\ (8\times4) \\ +\underline{160}\ (8\times20) \\ 192 \end{array}$$

Sheryl's proposed alternative algorithm for multiplying a two-digit number

Figure 2. Two approaches to multiplying two-digit numbers discussed in IMT meeting

Helen was helping Sheryl to see how what she was trying to teach them conflicts with the prior knowledge they already bring about carrying--even though they don't know why they carry. Sustaining the investigation, Helen turned to Lisa and asked, "how do they [your students] do it, Lisa?"

Lisa laughed, "That wouldn't help!"

"What?"

"They have a tool", added Lisa.

In the moment I did not catch what Lisa was doing. Slowly, I began to see that she was taking Helen's question as an opening. Adding her own humor and drama, she was creating another entry into the conversation that was connected to her videotape.

Lisa smirked and said, "They use stars. It's on the videotape. This multiplication thing actually came up when we were working on adding and subtracting decimals."

Having captured the group's attention, Lisa introduced the videotape. She described how her students had been generating number sentences equal to 1.019 (e.g., .744 + .275 = 1.019). Then, she started the videotape. Suddenly she became confused, almost panicked. She thought she had the wrong videotape. She stopped the video player. She looked to me for clarification. I didn't react because it looked to me like she had the tape she had decided on at the end of our prep meeting. But something did feel confused.

The problem was Lisa had described for the group the math class that preceeded the class she was about to show them and she had gotten momentarily flustered. I was of

no help other than to react so slowly that she figured it out, regrouped, and explained the correct context for the segment:

> The context instead—that (number sentences = 1.019) was the previous day. I was getting a feeling that there were kids that were thinking that decimals were less than zero. No one had said that they were less than zero, but I was wondering if they thought that. So the next day I told them that last year's students took a quiz. And on this quiz there was a problem that asked them to compare zero (0) and 515 thousandths (.515) and to show which is greater than or less than and to have an argument for it. I told them I wanted to know what they thought about this problem. So, *that's* where this started. And the star issue is in here.

The group waited quietly as Lisa worked through her mix up. As the videotape began to play again, Carole commented, "Oh, nice!" as she watched one sixth grade student say to her classmates, "while he is drawing this, I will explain." The IMT group settled into quiet viewing.

There was some difficulty with the audio on the tape and I was keenly aware that having been there and having reviewed this segment several times I was able to fill in where sound was weak. Both Helen and Kathy were good about asking for clarification on what they were missing.

Helen asks, "Wait a minute, I don't get it."

"I don't either", said Kathy.

Lisa stopped the video player and explained, "He was saying that zero is a whole number and so think about the place value of zero as the place value of one whole. But a decimal has a place value of tenths, hundredths, thousandths, and smaller. What he was

saying is, 'if the decimals are here—(0.) zero point whatever number—then zero is still larger than all decimals.'"

Helen repeated the student's idea, "So zero is bigger (than .515) because it's a whole number."

Lisa nodded 'yes' and started the video player again. There was a long stretch of silent viewing as the sixth graders' discussion moved away from the comparison of 0 and .515 to one student talking with Lisa about how they were taught in fifth grade to use stars as place holders in computing two digit multiplications problems. Lisa probed the students for their use of this "placeholder" and why they needed one to work on the problem. In the midst of Lisa's probing, Tammy, a sixth grade girl, made a comment that linked the discussion of place holders to the problem of comparing 0 and .515:

Pasek: So why are you concerned about not being in the ones place, or --?

Student: 'cause you could take 200--what--280-- or 218...you add on another zero.

Pasek: I am just wondering what that placeholder is for. Tammy?

Tammy: **Um, Another way that you can show if 0 is greater than .515 is um, put 0 and put .515 and then you can add 0s as place holders and then you say, there's 0 here and 5 there, so this must be greater, 'cause there's already 5 there. That's 0 and that's 1, that's 5 and that's 0.**

Pasek: Did you do div--subtraction, or?

Student: No.

Student: No.--just compare

Student: comp-

Student: compare 'em.

Student: Like if the 5 is bigger than the 0, then that's larger and if the 1 is bigger than the 0, that's larger and if the 5 is bigger than the 0--then, then the whole problem is bigger than the other problem.

Student: I agree.

Lisa stopped the videotape and went to the write board to show the IMT group what Tammy had written on the board:

0 0 0
.5 1 5

She explained how Tammy compared the numbers in each column to show that 5 and 1 and 5 are each more than 0 so, .515 must be more.

Marian, a seventh grade teacher, asked, 'What if it's .505?" Lisa responded that she had asked that question of Tammy next. It wasn't clear what Tammy's response had been. Instead, Lisa emphasized to the IMT members that everyone in the class seemed to understand what Tammy was talking about, but this like other ideas offered by Tammy frequently seemed to come out of nowhere.

Without further investigation, the group returned to watching the tape which included two more students making interesting moves in the discussion. One sixth grade girl went to the board and drew a representation (see Figure 3.) of the base ten block, a

wooden block that the students frequently use in working out solutions, and she used her drawing, shading in the squares to show what .515 looks like and to argue that it is greater than 0.

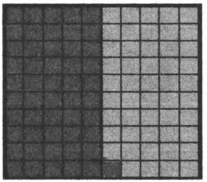

Figure 3. Base ten block shaded to show .515

Kathy, a second grade teacher, asked, "Do they understand that [drawing] Lisa.? That seems so strange to me."

Without stopping the tape, Lisa replied, "Oh, I use it a lot."

"Oh, do you?"

This exchange of question and answer between Kathy and Lisa struck me as odd, unnatural somehow. I was reminded by their talk that we were engaged in a novel kind of dialogue and everyone seemed to be moving carefully into this new territory. It was as if Kathy and Lisa, who had a year long history of talking together about their teaching, were now conscious and careful in their remarks, as if they were new conversational partners.

The tape continued to play through the last episode Lisa wanted the group to see. In an effort to convince his classmates that .515. was more than 0, one sixth grade boy wrote on the board:

$$1 - .515 = .485$$
$$1 - 0 = 1$$

"So", the student argued, "zero is one whole from being equal to 1 and .515. is only .485 away."

Lisa stopped the tape and IMT members began to comment on this last episode. One IMT teacher wondering about how what she saw on the tape was connected the kind of instruction the students have had in previous years. In response, Lisa told how she thought the students understand that fractions are part of a whole. But, when working with decimals the way we write them creates conceptual confusion. Lisa said, "It's like a count down 5, 4, 3 ,2, 1, 0 and coming down the number line you get to 0.2.

Another IMT member wondered aloud about one student's comment, very near the end of the class discussion. Lisa explained that "it's two minutes past lunchtime at this point. I don't know if he really understood that...the timing was bad for having a lot of time to go through it."

And so for the next forty minutes the IMT members continued to ask Lisa questions about the students, about the activities in this unit on decimals, and about a particular strategy that might be helpful. They asked a lot of questions. Indeed, the question/response rhythm of talk around Lisa's videotape drew my attention to the patterns of conversational involvement in how Lisa was using the videotape and how it was helpful.

At one point, there was a lull in the group's discussion and Kathy made a comment that shifted the pattern of talk. She said to Lisa, "Well, I really liked watching your tape, Lisa. I feel much better."

Helen said, "Well, it made me feel both better *and* worse because it was really neat to watch. But I realize how hard the ideas are".

Kathy added, "I feel like I could come into your classroom and learn math."

Lisa thanked Kathy and returned quickly to talking about the complexity of understanding her students' ideas, telling another story of a time when her students made visible their understanding of place value. The students' explanations reflected algorithm-based teaching rather than conceptual understanding. Lisa made clear once more the connection she had seen between Sheryl's original questions about the multiplication algorithm and her own teaching. She said:

> Thank you, [Kathy]. Even though it's frustrating, it is exciting to have--even when you see how much they're confused about.... One day we were having a discussion...we're talking whole number subtraction (3000 - 2000 = ?) and I kept saying, 'Why are you getting those 9s? (3000 - 2000 changed to 299910 - 2000 = ?) Where are the 9s coming from?' They said, 'We are stealing them.' They explained that the same teacher who taught them to use stars told them they are stealing, not borrowing in subtraction, because you don't give it back. I said, 'What are you stealing from the 3?' They said, 'a 1.' I asked, '1 what?' They said, 'a 1 and you have 2 left.' Then someone circled 299 and said, 'All you really need to worry about is the 299.' 'But is that 299?', I asked. 'Yes. 299 and a 10.' He is a sixth grader.... That is why I would suggest [with your fourth graders] keep going with connecting the algorithm with the concrete because if you go from the concrete to the algorithm they'll never...they won't connect it back and if you don't teach them the algorithm they're going to learn it somewhere and they might never know why.

Lisa's comments seemed to bring the group full circle and shortly thereafter the discussion shifted to a new topic, marking the close of Lisa's sharing and the group's focus on her practice.

Lisa's Four Conjectures about Showing Videotape

Before showing her tape to the IMT group, Lisa had outlined four ways that showing her videotape would be helpful to her: 1) jamming; 2) reaffirming her vision of this kind of mathematics teaching; 3) the fun of showing and telling about happenings in her classroom; 4) questions from the group that would push her thinking. I want to note at this point that in her preparation for showing her video Lisa refers to *her* having a question to answer. In one instance she talks about having a question "open-ended enough that it would engage people on different levels." Another time, she summarizes her four levels of potential benefit by saying, "...four levels that don't even include me having a particular question answered." This note is important to the analysis that follows. Lisa's "four levels" held for her the potential to create a "kind of coming out party." I will use these four levels now to look closely at Lisa's sensemaking of this experience.

Making Practice Public
"A Kind Of Coming Out Party"

Describing her sharing of tape as a debut, Lisa was talking about making a move that she knew was unfamiliar, perhaps viewed as radical in the traditions of teachers' interactions (Little, 1990). She wanted to make her actual practice public; she wanted to show the others her teaching in a way that her stories could not. Lisa's phrase, 'a kind of coming out party' reflects the drama embedded in revealing to her peers a vivid, multi-dimensional representation of her classroom. Lisa had imagined sharing videotape in the group as a way of saying, "This is what it really is—whatever I told you—whatever my perceptions are of it...I want to know where I fit in." In part, she had described a desire and an expectation that the IMT group would affirm that she was enacting the vision of teaching they shared as the Investigating Mathematics Teaching group. She wanted to know if what she was doing daily aligned with the other teachers' efforts to create a discourse among children through which they represent their thinking to one another, explore conjectures, and argue evidence for their solutions to problems. She was using the videotape to say to the group, "This is who I am as a teacher in my classroom, in action."

While she approached this debut with enthusiasm, Lisa wanted to avoid having her debut jeopardize her good standing as a member of this group. Her concern was grounded in her perception that they were a "likeminded" group of teachers (Little, 1990). What if this debut exposed her as too different from the others? Lisa understood the risk

of critique, judgement, and advice-giving that might come with showing her practice on videotape ("There might be people who would say... 'Oh, you're talking way too much' and somebody else would say, 'You're not directing the kids enough.'). She understood that in showing a videotape she might have less control over what others attended to than when she told them a story of her teaching ("With the stories, they respond to the stories...they can't ask me about things that I don't tell them about."). She understood there might be differing perspectives among group members. Lisa used her understanding of the group to shape and guide her approach to talking about her videotape.

Lisa seemed, too, to have a strong grasp of the way these risks were also opportunities. She seemed to have weighed the risks in making her practice public against her desire for affirmation and decided that public disclosure was likely to be worthwhile ("I predict that whatever happens it will be helpful."). She knew that *how* she shared her videotape with the IMT group mattered for the kind of conversation it might stimulate and the message her sharing could convey to these colleagues. She planned and acted with a protective stance toward the group members' relationships and the ways of interacting already in place. Lisa did not want to appear to her colleagues to be taking more than her due of the resources they shared in the time, attention, and support of the group. This cautious, almost timid, approach to attending to an individual teaching practice coupled with her female propensity to know and learn through connections with others (Gilligan, 1982; Belenky et al., 1986) gives reason to Lisa's "easing in" to her sharing of videotape and to her framing the situation loosely such that she would see what they might see. Her

valuing of the group's history, her concern for sustaining it's work, and her aim in preserving it as a resource for everyone seemed to shape Lisa's expectation that whatever happened, she would gain from the experience. She was seeking affirmation and that in itself was worth this pursuit.

Lisa considered that her pursuit of affirmation via a public example of her work might provoke an unusual kind of exchange among teachers ("two teachers that are professing the same beliefs...and they took very different stands...") and such possibility was exciting to Lisa. Beyond jamming, showing, and seeking affirmation, Lisa expected to be asked questions that would "push her thinking." She had experienced this *pushing* in previous IMT meetings, particularly in the fall of 1992 (Pfeiffer and Featherstone, 1996), and it seemed predictable that the group members would ask her to describe further what they saw on her videotape.

Lisa expected to gain all this, "even without a question to be answered." Her expectations were met—with high marks. She had set the session as a jamming session, not telling the group exactly 'how to play' the conversation. She had been affirmed that she did "fit in" among teachers who are working actively to make significant changes in their mathematics teaching. In addition, she came away from sharing her videotape with a sense of success: "I felt good", she reported. Feeling affirmed that she was on her way to creating a different kind of math class, she found the experience enjoyable and rewarding. She spoke, for instance, of her fascination with the different perspectives members held in interpreting Tammy's move in the discussion of 0 and .515. She now saw Tammy's

move as significant for the way it pulled together the students' talk about the relationship of 0 and 1, and 0 as a placeholder.

I first learned about Lisa's satisfaction with the experience in an extended telephone conversation. My understanding of her experience developed through our numerous conversations in the months that followed. Lisa's journal writing also provided me with insights about her sensemaking, her analysis of what this form of public inquiry involves.

Reflections on Sharing Videotape

I telephoned Lisa in the evening on January 6, 1993. The holidays and the semester break had interrupted our routine of meeting and talking about this work. We talked briefly about our holiday travels and the fact that she was now back in school.

I had telephoned Lisa the night before to arrange this conversation, asking then if she had written about her sharing videotape in the meeting. When she said she had only sketched a few notes, I urged her to write in her journal in preparation for our extended conversation. The following evening, when I asked Lisa to begin describing what it was like to share her video with the group, she talked from her journal entry about her response to Kathy's comment:

"I'm so glad you shared that. It makes me feel so much better." Kathy's very first comment caught me off guard--my first (paranoid?) reaction was--"what? this is so awful, you don't have to feel so bad about what you do?" But

considering the source and the context, I immediately knew that this was why I had shown the tape. In fact, what Kathy expressed is actually what I had hoped would happen, and actually did happen for me--being reassured of a shared vision--of acknowledgement that my struggles are good, worthwhile struggles, not futile, time-wasting pointless discussions.

(Lisa's journal, January, 5, 1993, underlining in original)

As Lisa spoke about her realization that Kathy had provided her the affirmation she was seeking, she realized, too, that by showing her videotape, she had provide the same for Kathy. She said:

> What she was really saying was—what I had wanted to get out of it myself was having other people see it to see if—am I sharing their vision? That's what I wanted to get out of it. So, she actually got the same thing out of it. Seeing somebody else's teaching, 'Oh, wow, I *am* on track.' So it was kind of—I don't know—we shared that.

> And also, the acknowledgement that spending this much time struggling with this question, affirmed that this is a good worthwhile struggle and you're not wasting your time with pointless discussion.

Lisa said that since returning after the holidays she felt a strong tension in her school. It seemed to her that teachers were "doing double takes" when they stopped by her room, looking at the board and asking questions about what was going on in her classroom. She said she was keenly aware of justifying, at least to herself, what she is doing in her teaching. It reminded her "of the contrast between sharing with people you trust in an IMT group and justifying to others--being on the defensive--or others being defensive themselves."

When I asked Lisa to talk more about her experience in the IMT meeting, what seemed like the best part about sharing her videotape, she focused on her interest in *what*

others attended to in the segment. She commented:

> There was no way to predict what others would pull out. Tammy, for example; the conversation about Tammy's comparison of 0 and .515. I have a heading in my journal now called, *Tammy: Diplomat rather than Daydreamer.* It is pushing me to listen harder to her in class.

I asked Lisa if the experience of sharing tape in the IMT group "cost" her anything. She was quick to respond, "No, it did not." She said that it "was not a fabricated situation—to collect research data—it felt like a natural progression" from where the IMT group had been. She likened it to playing baseball, saying, "OK, I'll go to bat first and I guess I got to base." She explained that she knew this because she felt good about it: "It felt safe."

Lisa was telling me that three of her four expectations had been met in this "trial" use of her videotapes. She had already described her sense of affirmation, the fun of sharing the tape, and her fascination with seeing what others see. She was also telling me that she had a sense of having moved the group into new territory in a way that felt like a natural next step—and it felt safe. As we continued, Lisa began to talk about the limitations of the group's conversation. She grappled with language to describe her desire to return to the group with more videotape so that she might be pushed or "dig deeper." Her analysis of what went well and what was missing is important to this study in at least two ways. First, Lisa's marking off her first sharing experience from possible future work helped us explore what more beyond safe, affirmative sharing is needed for her to use her own videotapes in learning to teach mathematics. Through our conversations, she

identified two changes that would help shape the conversations around her videotape to be deeper, more investigative. Second, understanding why Lisa's reflections made sense in light of the current culture of teaching, offers other teachers, researchers, and teacher educators insights into how we might begin to alter familiar ways of interacting that actually block the transformational work envisioned by reformers.

I turn now to my analysis of Lisa's analysis of her experience. I will describe more specifically the two changes Lisa identified as important for her continued use of videotapes in discussions of her practice.

A Question of My Own

Lisa continued to reflect on her experience of sharing videotape in the IMT group and she commented that it would be interesting to go back to the same videotape and have a question of her own:

> I was thinking that this first time was, and I think we had talked about this the last time we talked, that this time felt kind of like a trial—I want to see how this goes. And so there was a lot of value I think, it was just kind of at the base level, the general, 'What do you think? Is this what you think too?' And so, I think it served definitely that purpose. It felt on level with what people were talking about. And probably—I was thinking about—it would be interesting to go back to the same tape and have a question. Get at the same thing. Look at the same thing and dig deeper, or um, kind of open up to be pushed a little bit about, well, 'Why did you ask that?' Or some of those questions that kind of take a little bit of easing into.

It had been Lisa's expectation that the group would have questions that would push her thinking. But that hadn't really happened. Together, we concluded that without

a question, a wondering of her own, the conversation seemed to stay at a certain level. She wanted to "dig deeper, or kind of open up to be pushed a little bit ... some of those questions that kind of take a little bit of easing into." We began to explore, struggling for language, why she must pose a question and moreover, why *she* must be the one to raise the question in order to engage the kind of conversation she wants. We said:

Lisa: I liked having a piece with a lot of potential. Um, and I think a lot about you know, I don't know exactly what questions I would have, but I think it would, I think I would need to have some sort of wondering to ask them about it, to bring up myself in order to get um, maybe at a, I don't know whether to term it deeper or higher,....

Lauren: I know what you mean though.

Lisa: Going past and going up to pushing, or working down to pushing ideas.

Lauren: I think it could happen even in that same clip. I think one of the things I learned is that *does* have to come from you then. I don't think we did that. I think there was a lot of thinking and responding, but I do think it sort of stayed at a different level.

Lisa: For that clip, I don't know what the question would be. I don't know if it was another tape, if we'd have to see it again, if we'd have to see a piece of new tape, one to get a general feel and hash out the surface, and then see it again and get at a question or ....

In this part of our conversation, we see Lisa's thinking shift from sharing videotape in exploratory ways to more purposeful investigations. Relatedly, and critical to our understanding of this new work, I think, we see Lisa taking responsibility for this shift. She assigned herself a more active stance toward shaping the conversation to fit her needs.

Shared Experience with Sharing Videotape

In addition to needing to have her own questions, Lisa identified another way to improve the conversation around her videotape. As we talked, these two criteria became woven together as a complex response to what makes using her own videotapes of teaching a potentially educative experience. We said:

Lisa: And I think, I think having other people share too, would help.

Lauren: Yeah, I think so too.

Lisa: Because then it wouldn't be um, you know, it wouldn't be so one sided. They would all have a stake in wanting to push and you know, the first time it's nice and reaffirming to come away from it, "Oh, that was nice, I'm glad they did that." And the next time, I would think everyone would want more.

Lauren: Yes.

Lisa: The first time is kind of like a show-and-tell.

Lauren: Yes.

Lisa: You know, like, see, that's what I did, this is what I brought. And people wonder all about it and ask questions. Oh, that was really nice. But then, you know, it's different if you keep coming back and you want to dig at it.

Lauren: So you think presenting it would look at little differently the next time you did it?

Lisa: Yeah, I think so. It's almost like, I want to go back, you know, if I could go back into that meeting again, okay now, what do you *really* think? It's like, I mean, and I wish I had a question to ask of, you know, what do you really think about this? Um,

or, but it's hard with that tape because I can't think of a particular question that fits there.

It seems clear in this part of our conversation that Lisa held in mind a distinction between a first time sharing and a next time opportunity. She seemed to value the first opportunity to show and tell as an occasion to be affirmed in her vision of reformed mathematics teaching. But it seemed, too, that affirmation would not be enough the next time. She believed that everyone would want to move beyond a nice, warm and fuzzy visit to her classroom. In order to create more, the others members of the group would need to have more of a stake in the conversation, more of a stake in wanting to push the conversation. What Lisa seemed to mean by this becomes clearer in her next comments. She reiterated her need to have a question of her own, adding that it may need to be a video segment that she doesn't like. And she interlocked this questioning, this problematizing of her practice, with a call for others to share videotapes of their teaching.

Lauren: Right, and I think that's where I was thinking earlier, there has to be a genuine question. And you'll find them, you may not find them in all clips.

Lisa: And it may also be a part of a clip that I don't particularly like. That's what I'm thinking, is where it would come in.

Lauren: A part of a tape--

Lisa: That I don't like. That I feel is awkward or not handled well. I mean, in order, there has to be a real dilemma or a real you know, genuine wondering.

Lauren: A real problem of practice.

Lisa: I can't just go and poke my finger in my cheek and say, 'I really did like this part, what do you think?' And if it flows well and it seems like the kids are really thinking, it seems like it was okay. And it's not going to be a very meaty analysis. I mean, it would be a springboard, but as far as digging in deep, and that's why I think it would be important for other people to share, because I think after people would share it, they'd feel more at ease to know just from their own perceptions of what they would be comfortable with. How much they could--and then it would be like--I don't know--I just think there would be more of a reciprocal kind of feeling. I'll push you, but next time you push me. I *think* that's what people would want.

Making Practice Public *and* Problematic *and* Shared

Lisa worked hard to articulate what it means to use her practice publicly, in a way that would be meaningful and helpful to her. She figured out that in order to have the digging, pushing kind of conversation that makes her think hard about her teaching, she needs to identify a question around which the group will look at the videotape with her. It was good and worthwhile to see what the others might see. At the same time, this approach to the conversation constrained how the teachers talked together. The group did not delve into a more complex level of talk.

In order to engage the group around a genuine question, Lisa realized she would need to be willing to show her practice as problematic, "something that is awkward or not handled well." This need to make her practice public *and* problematic is linked tightly to Lisa's second criterion: others need to share in the experience of being vulnerable to other teachers' observations of their practices.

Lisa's concerns reflect her socialization into teaching that taught her a teacher's competence is measured largely by her performances of smooth, clear, "successful" lessons. To disclose to other teachers the rough, messy, uncertain events in her practice can be uncomfortable. This difficult public "scruntiny" (Little, 1990) of the messiness of her teaching is necessary to "open up" to the pushing and digging and investigating that she seeks. She believed it would make a difference if others had a shared sense from first hand experience what it feels, sounds, and looks like to present their practices in this public way. Then they would know "from their own perceptions of what they would be comfortable with...." This would ready the group to up the ante and to push everyone's thinking. There would be a "reciprocal kind of feeling" about pushing each other.

As the first sharing of tape went, it was helpful to Lisa, but she wanted to gain the benefit of pushing further into an investigation of teaching and learning. Lisa trusted the IMT teachers, but she was seeing that, as a group, they would need to learn to stand on that trust, to use their shared resource of predictable support and good will, to "dig in" to their practices.

Lisa's experience and her understanding of the group convinced her that to benefit from using videotapes to stimulate conversations with her colleagues two changes needed to occur in the group's conversations around the videotapes: 1) the teacher showing the tape needs to have a question/problem around which she wants the group to focus a collective investigation and, 2) the other teachers/viewers need to experience making their teaching practices public with a videotape of their work. These changes in the way the

members interact with each other are changes in the social dynamics that shape the roles and relationships held by individuals and guide the work of the group as a collective. The dynamics of the IMT group, or of any group, argues sociologist, Erving Goffman (1963), are governed by rules of behavior that direct members' interactions within a "social occasion" (p.18). A next step in understanding the changes Lisa identified is to examine them in terms of the rules of behavior that directed her first experience in sharing tape and to explore how altering these rules might result in the kind of interaction she seeks.

Boundaries On Conversation, Boundaries On Learning About Teaching

Much of Lisa's talk about sharing her videotape in an IMT meeting--her preparatory talk and her reflective talk--focused on structuring, defining, the experience in a particular way; even an open-ended, wait and see, approach is a structure. The structure or boundaries that kept the IMT group's conversation around Lisa's videotape "safe" and at a "base level" were the result of choices Lisa made and adhered to in the meeting. She chose to "ease in" to the conversation, where the activities of the meeting did not deviate much from other group meetings. She chose what she thought was a "safe piece of teaching"--without real problems she might be uncomfortable exposing. These moves on Lisa's part contributed to the boundaries that surrounded the group's talk around her video. We can think of these boundaries as the rules of behavior that directed the group's conversation. Though not explictly discussed by its members, the group's discourse around Lisa's sharing of videotape was rule-governed.

What are these rules and where did they come from? Rules or norms, as Goffman defines them, "are the kind of guides for action which are supported by social sanctions, negative ones providing penalties for infraction, positive ones providing rewards for exemplary compliance" (p.75). In the IMT group, the teachers draw on the social norms of the predominant teaching culture to guide their interactions during a meeting. These norms of collegiality, as teachers know them, direct the way they act or don't act; what they say or don't say in response to another teacher's practice.

In general, Goffman describes the relation between norms and interactions in this way:

> It can be argued that norms or rules impinge on the individual in two different ways: as an obligation that requires him to do (or refrain from doing) something in regards to others, and as an expectation that lead him to anticipate righteously that something will be done (or specifically not done) by them in regard to him (p.96).

As I described earlier, the prevailing culture of teaching reinforces norms of politeness. Generally, teachers' interactions follow a fine dance of attention and helpfulness that aims to support a friendly atmosphere (Johnson, 1990). But the dance as it is constructed, for good and for bad, sustains a sense of privacy and individualism around teachers' own practices (Little, 1990; Hargreaves, 1993.) Through their early socialization in the culture of teaching, teachers acquire and refine supportive, but "hands-off" norms that gain them successful membership in a faculty. They become skilled in knowing how to help without being pushy (Lortie, 1975). When teachers do talk about

their work, most are quite facile in talking about teaching without revealing the struggles and uncertainties inherent in the practice. And collectively, they master ways of exchanging information on teaching without linking it to an assessment of a teacher's actual practice (Newberry, 1977). As Feiman-Nemser and Floden (1986) report, teachers' conversations address "politics, gripes, home life, and the personalities and family background of individual students, rather than curriculum, instructional content, or teaching methods" (p.509).

These "expectations" and "obligations" (Goffman, 1963), which preserve a culture of non-interference, constituted the boundaries that delimited what Lisa experienced as a first time, "base" level use of videotape in talking about her teaching. In order to move beyond, to reset the boundaries, the expectations and obligations or rights and duties would need to change. That is, what a participant is required to do or refrain from doing, and what a participant can righteously expect will be done or not done must be altered in a way such that the group can collectively investigate the particulars of a teacher's practice. In Lisa's words, this change meant, "open up to be pushed." What she explored in her reflections on the December IMT meeting was the creation of new norms that would support making her practice public toward educative ends. To better understand the relationship between Lisa's call for a question for herself and shared experienced for the others, and the changing of norms in the group's conversation, it is important to first understand the rights and duties that were at work when Lisa shared her videotape the first time.

The Rights and Duties in the IMT Conversation around Videotape

The full seventy-five minute conversation, from Lisa's introduction of the videotape until the group moved on to a topic distinct from Lisa's video segment, has four main components: introduction, viewing/discussing, discussion following viewing, and transition to a new discussion. The discussion following the viewing of tape can be marked off into six segments. (see Figure 4.) By count, there were 170 conversational turns in this forty minute discussion, during which 56 questions were asked. The question/response pattern of the group's talk showed a strong pattern of one-to-one L (Lisa) and M (IMT member) exchanges. This pattern became particularly interesting to me when I saw that all but one (turn #168 of 170) of the 56 questions are questions asked of Lisa by another group member.

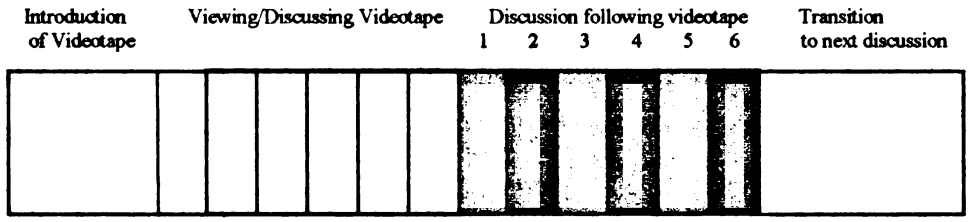

Figure 4. Three segments of the discussion following group's viewing of Lisa's videotape.

In what follows, I look closely at segments two, four, and six from the discussion that continued after the group viewed Lisa's videotape. I selected these three segments for what they illustrate about the patterns of talk in the IMT group and how members of

the group, particularly Lisa, adhered to and, in one case, attempted to deviate from the norms that governed their talk. The first example shows a clear pattern of questions and answers. The second illustrates a break in the pattern of questions and answers, while the group adheres to a set rights and duties for interacting with Lisa about her practice. The third segment includes a possible shift in the rights and duties, but no uptake from Lisa. My analysis of each segment includes an outline of the rights and duties that governed the discourse among the IMT members. Together, these three examples illuminate the boundaries that kept the group's conversation at "a base level."

Segment Two: A Pattern of Questions and Answers

In this first example, the second segment of the discussion, Lisa led the group in defining the situation (Goffman, 1959) as a conversation about her students' understanding of zero in a multi-digit multiplication problem. She did this by introducing the tape in connection to the ongoing discussion of Sheryl's problem of practice. She did not frame the situation as "bringing a videotape to the group for their help in grappling with a particular issue"; remember, she was "interested in what other people might notice." In this way, Lisa "positioned" (Davies and Harre, 1991) herself and, in turn, was positioned by the others to be a respondant. We can see in the discussion how she was positioned by others to be a respondant, an informant, and even an expert about this particular sixth grade classroom.

In this segment, IMT members asked Lisa questions about her curriculum

and her pedagogy and she responded with detailed descriptions of what she is doing in her classroom, how it compared to the previous year, and what she knew about the problems in her students' thinking:

Sheryl: What have you done with decimals up to this point? Lots of...

Lisa: We've done a lot of representing decimals and thinking...the way I went about it this year like we never talked about...tenths as this is .1 this is a tenth. We talked about: You have 3 candy bars and divide it among ten people. Then they talk about ways to show that and we went into it through fractions. Then we talked about how would you represent this with decimals. Then they did it on the calculator ... they found they could do the same problem on the calculator and get .3 so we talked about that it means the same thing as something divide it into ten parts and each part is a tenth. It was really hard because the little unit cubes that second and third and fourth [grades] use as one...I still have kids saying...when they're using their model with the base ten blocks...they have one whole, they've got tenths, and then they've got ones. 'What is that?' 'This is the ones.' I said, 'Show me one whole again.' They would say, 'This is one whole.' 'And this is a tenth of it and this is one.' I say, 'Why do you call it a one?' And they say, 'It takes one hundred of them to make a whole.' 'So what do you call it if it takes one hundred of them to make a whole?' 'One!' But it's...This is the first class that's ever done that.

Carole: That's when manipulatives came in.

Lisa: Yeah. So they've got one whole, tenths, and ones. A lot of...it's been really interesting. Last year's group, we did decimals and fractions all together and they had all this background and decimals were like...I don't know if it was that they understood it so much better because they were a much stronger group. Skills wise. I don't know if they understood it that much more or if I just approached it differently so I just assumed more. I never dug into problems like this...so maybe they did have these misconceptions but I didn't dig them out. But I...like I asked them to write about what they knew about decimals before 6th grade and they knew it involved a "point" and they drew

pictures and they'd show 3.37 and they'd draw an arrow and say see like this. Last year's class when I asked them to write about what they thought 6th grade would be about they said we'll learn more about decimals and fractions. This year's group when I asked them to write about what they thought 6th grade math would be about said... 'I think I'll get better at my multiplication tables.' So... 'cause I'm really bad at them.'

Lisa: I would like to grab anyone that was one of the NTCM--that has their names on any of those books and have them come to my school and tell my principal-

Kathy : -Drill, drill, drill.

Helen: Did you ever do anything with negative exponents?

Lisa: We didn't touch it at all. I showed them 1 divided by 10 of the first power and 1 divided by 10 of the second power and you know so you looked at that pattern. And that was...in fact it was a long time after we had talked about tenths, hundredths, and thousandths. So we kind of went back to that and picked it up and showed the pattern cause I didn't want to spend a long time going into..then it would be ten thousandths, then it would be a hundred thousandths, but I wanted them to see that it would continue and that they already knew the pattern. So it wasn't anything like that. It was just 10,9,8,7,6,5,4,3,2,1,0...and then it's...I can see where....

Marion: Have you had them do that...have them take a number line and a bunch of numbers and have them put it on the number line?

Helen: What happened?

Lisa: There are a few kids in every class but still...if it was .5 or .87 but if it was 1.7 they accurately put it one whole and 7 tenths.

Helen: --space between two and one.

Lisa: Yeah. Once they have a whole number in front of it like 2.2 then it's fine; then they have a whole number to grab onto.

Lauren: It's like Jose's idea that zero is a whole.

Marion: 0.515 is.....[inaudible]

Helen: So they're completely clear that 2.24 is more than 2?

Lauren: but .24 would be less than--

Lisa: Well out of 30 kids maybe 2 or 3--I'd have to look. I don't know if anyone in my class did that. I know--

In this segment, the ***rights*** of the IMT members to ask, to comment, and to infer about Lisa's practice provide the structure to the conversation. There is a pattern of IMT members asking questions and Lisa responding, adding information, and clarifying. Lisa's responses fulfill the corresponding ***duties*** that enable the group to sustain their dialogue. Table 1 shows an outline of those rights and duties at work in this segment.

The IMT members' rights and Lisa's duties worked together to reinforce Lisa's role as expert informant about her classroom. Across the seventeen conversational turns in this segment, the IMT members ask Lisa five questions:

- What have you done with decimals up to this point?
- Did you ever do anything with negative exponents?
- Have you had them do that--have them take a number line and a bunch of numbers and have them put it on the number line?
- What happened?
- So they're completely clear that 2.24 is more than 2?

Each time, Lisa responded with additional information, details, quotes of students' explanations, and her own color commentary about the struggle to help students develop conceptual understandings about decimals. Though Lisa had not framed a problem or a question it seems the members were working on an assumption that Lisa was struggling

with how to teach decimals. However, the group's questioning seemed to be only a general poking about, general questions about the kinds of work they had done and whether or not she had addressed a topic.

Lisa	IMT members
Right: to wait for group to determine next focus	Duty: to make clear what they want to talk about with a question or observation
Duty: to respond, offering additional information	Right: to ask about Lisa's curriculum, progress, accomplishment this year
Right: to offer commentary, opinion on topic triggered by questions	Duty: to listen and respond to her commentary
Duty: to respond with description and assessment for use or not use of strategy and how it relates to topic	Right: to ask about pedagogical strategies Lisa has used
Duty: to correct or qualify members' summary or inference	Right: to propose summation or inference from Lisa's description

Table 1. Reciprocal Rights and Duties for Segment Two of the Group's Discussion

By holding the right to "see what other people might notice", Lisa assigned the group members the corresponding duty to make clear what they wanted to talk about. By holding the right to ask questions of Lisa, the group members assign Lisa the duty to respond. But, additionally, by Lisa holding the right to wait and the duty to respond, the group members are left unsure about what Lisa might want or be willing to investigate or

how to probe ideas with Lisa--that is, how hard to push.

The rights and duties at work in this segment suggest that Lisa's right to wait and see bound everyone's participation. The traditional norms for talking about her teaching *blocked* her from also holding a right to frame specific problem or question about her work. As the conversation was defined and governed she was not in a position to ask the IMT members questions that might inform her practice. Moreover, she was not positioned, by the familiar rights and duties, to ask questions of herself publicly. Claiming such a right would go against the norms that direct teachers to present themselves as competent, smooth performing practitioners. To ask questions of herself would focus the discussion in a particular way and Lisa wanted to see what others might see. Again, Lisa positioned herself in ways reflective of the existing norms of privacy and sameness among teachers.

Were Lisa to assign to herself the right to ask questions of the other members she would have then assigned the group members a corresponding duty to respond with opinions, examples, additional probing questions that seem to create the kind of conversation that Lisa describes as pushing her thinking. It seems probable that this shift in asking and responding would have altered the conversational pattern. There may have been a greater likelihood that the pattern of questions and responses, directed by Lisa to members, would not have been sustained. And instead, the IMT members may have been positioned by Lisa as informants about teaching and learning, situated in Lisa's practice, but perhaps also drawing on their own practices and other references. It is likely the

group members would still have asked questions, but they may have also offered probing inquiries that reached beyond the information Lisa could provide because she was the teacher, probing inquiries that pushed Lisa's thinking and the collective thinking of the group.

Segment Four: A Break in the Pattern of Questions and Answers

I now examine a second example of how the rights and duties of the group's conversation bound Lisa's opportunties for deep, educative talk about her teaching. This example is the fourth segment of the discussion, about fifteen minutes into the group's talk around Lisa's videotape. There was a lull in the conversation and Kathy shifted the focus to what it was like for her to watch Lisa's teaching on videotape:

Kathy: I really liked watching your video. It made me feel better. [laughter]

Helen: It made me feel both better and worse because it was really neat to watch but I realize how hard the ideas are.

Kathy: It made me feel like I could come into your classroom and learn math.

Lisa: Thank you. Even though it's frustrating and exciting to have them ...even when you see how much they're confused about. One day we were having a discussion about--Jose was saying that people were taking 3000 and subtracting something--there was discussion about how you borrow. Jamie went up and put up a whole number problem 3000 - 2000 or whatever, it didn't matter, some situation that you would have to borrow. She crossed off, everyone is saying crossed off, it's 10; crossed off, and it's 9; crossed off, this is 9; crossed off, this is 2.

Carole: I understand.

Lisa: Everyone agreed that ....and that's how it had to be and Jose said... I was saying, 'Is that the same number?' Jose went up and said, 'No, that's a larger number' and he wrote 29910 and 3000. 'See, this is a five digit number and this is a four digit number.'

Lauren: How 'bout you put it up on the board. I think then we imagine the dramatics there. What they did.

Lisa: ...For dramatics he went and wrote them right on top of each other...29910. He said, 'It's obvious.'

Kathy: So he put the one on top...

Lauren: What did you do?

Lisa: This is—we're talking whole number subtraction and I kept saying, 'Why are you getting those 9's. Where are the 9's coming from?' They said, 'You are stealing.' It's called stealing. I said, 'Then what are you stealing?' They said, You're stealing from the three.' I said, 'What are you stealing from the 3?' They said, 'A 1.' Lisa asked, '1 what?' Kids said, 'A 1 and you have 2 left.' Then someone circled the 299 and said, 'All you really need to worry about is the 299.' 'But is that 299?' 'Yes. 299 and a 10.' He's a 6th grader...

Steve: That's like the star...

Lisa: He said, 'Mr. Miller said you can just circle the 299.' That's why I would suggest keep going with connecting with the algorithm with the concrete. Because if you go from the concrete to the algorithm they'll never ... they wouldn't connect it back and if you don't teach them the algorithm they're going to learn it some where and they might never know why.

In this segment of the conversation, the group broke the pattern of questions and answers. Kathy altered the pattern of the group's talk when she made a reflective comment about what it is like to watch Lisa's teaching, acting in her duty to respond to Lisa's sharing of videotape, but not with a question to Lisa. As an observer, I noted that

Kathy is particularly sensitive to the importance of acknowledging that Lisa has offered her practice for others to observe, comment on, and ask questions about. Kathy had shared a brief clip of her own math class with the IMT group one time at the end of their first year together. Also, she had shown videotapes of her own teaching in other professional contexts.

When Kathy commented that she liked watching Lisa's videotape, Helen followed with a comment that had potential for shifting the conversational rights and duties. Helen said, "It made me feel both better and worse because it was really neat to watch but I realize how hard the ideas are." Helen's comment can be viewed as an invitation or opening for Lisa to frame an issue, a question, an observation of her own learning to teach. Lisa acknowledged Helen's affirmation of the struggle but she maintained the boundary line on her "opening up to be pushed." She told another classroom story, sustaining her duties as a respondant in the conversation and an informant on her classroom:

Lisa	IMT members
Right: to hear what the members think about what they see on her tape and what they think about watching in a meeting	Duty: to respond to Lisa's videotape and to the event of watching it together
Right: to tell additional story, to use comments to direct the conversation	Duty: to respond to Lisa's direction for the conversation, by reponding to her story
Duty: to give a clear descriptive account of the event she is telling about	Right: to direct Lisa on ways to make her description clearer.
Duty: to respond to the connections members make between her descriptions, previous discussions, the video, and their own practices	Right: to make connections between her descriptions, previous discussions, the video, and their own practices

Table 2. Reciprocal Rights and Duties for Segment Four of the Group's Discussion.

Had Lisa claimed a right to ask questions of herself, she might have used Helen's supportive acknowledgement of how hard the ideas are to problematize the group's conversation and to explore more deeply what she and others understand about the students' thinking. She may have moved toward posing a question about how she or others might work with or act on this thinking in class. This example suggests that it is Lisa, the teacher whose practice is the site for situating the group's conversation, who holds the key to changing the norms—the rights and duties—that guide the conversational work of situating an investigation of teaching and learning in one's practice.

Segment Six: A Possible Shift in the Conversational Rights and Duties

Looking at the last part of the group's conversation, I think we can see another step toward creating Lisa's right to frame an issue situated in her teaching and to engage the group in an investigation that is stimulating and potentially educative in their respective practices. Just before the group transitioned to a new topic, Helen modeled for Lisa a question that would summarize the discussion the group had been having over the past hour. She seemed to be suggesting something that *could* be explored as an inquiry, a question stimulated by the videotape and the group's discussion:

Helen: So one question could be...whether you could help them to a way of thinking like—where, when the fifth grade teacher proposes all of these things like stars and—they would ask him why. Is that a natural thing? Can you?

Lisa: What are you saying?

Helen: I'm saying whether you could actually create a need in the kids to understand why the next algorithm that they're presented with—when Sheryl's kids go into 5th grade—is it possible that they could ask a Mr. Michaels, when he tells them to put a star in or whatever, 'Why?!'

Sheryl: That would be the ideal. Unless you have—Nancy Baker's niece is doing some tutoring in my class and she is so frustrated. She said, 'I'm so frustrated with a physics class and I keep asking the teacher, 'Why?' And he keeps telling her that...'you're too much like your Aunt Nancy. Don't ask why, just do it.' She doesn't understand any of it. She said, 'I can't believe he said that.' She's a senior in high school and is getting a D in physics. Normally an A student and he told her she's too much like her aunt. 'Don't ask why. Just do it.'

As I studied this conversation, this segment stood out because of Helen's opening

remark: "So one question could be...." Situated in the larger context of the IMT group and the group's shared committment to understanding this kind of mathematics teaching and to figuring out how to create such a practice, I infer several messages from Helen's comment. She was saying to Lisa, 'one question you and we can ask....' She was also saying, 'one question that this videotape makes me think about is....' Further she was saying, 'this videotape is teaching us something about the complexity of this classroom and how that complexity influences Lisa's decisions and her actions as the teacher.' Any of these connections to Helen's question is also connected to the group's vision of this kind of teaching. In terms of rights and duties, this segment has just two pair:

	Lisa		**IMT members**
Duty:	to listen to members propose a conjecture, question, summary, or inference related to Lisa's practice	Right:	to propose a conjecture, question, summary, or inference related to Lisa's practice
Right:	to probe members' comments for understanding	Duty:	to elaborate on a proposed conjecture, summary, inference

Table 3. Reciprocal Rights and Duties for Segment Six of the Group's Discussion.

I think this exchange gives us a glimpse of the possible. In these few moments, we see Lisa hold briefly a right to ask a question of a group member. And we see Helen respond with a corresponding duty to elaborate on what she is thinking. Helen's hesitating, her partial statements, indicate her own struggle to work through for herself what she is thinking.

Further, we see a group member, Sheryl, enact a right to elaborate, to respond to Helen's proposed question. In this way the question Helen posed was not heard by the group as a question for Lisa, as informant, but rather, an inquiry for all the group members to consider. Using this exchange as a working example, I can conceive of an additional set of rights and duties that would begin to shift the conversational pattern and engage the group member in a collective inquiry situated in Lisa's practice:

Lisa	**IMT Member**
Right: to ask	Duty: to respond
Duty: to respond	Right: to ask
Right: to respond	Duty: to listen
Duty: to listen	Right: to respond

Table 4. Possible Rights and Duties for Lisa and the IMT members

These rights and duties are comprised of three actions, asking, listening, responding. They hold a kind of symmetry that I think approximates what Lisa was describing when she said, "I just think there would be more of a reciprocal kind of feeling. I'll push you, but next time you push me. I *think* that's what people would want." When Lisa *and* the others hold a right to ask questions, the corresponding duty to respond is also shared by all members and it carries potential for the group to collectively work their way into a "digging" inquiry.

Sharing The Relational Work Of Creating New Norms

Stepping back from the language of conversational rights and duties, we can use these examples from the group's discussion to understand more deeply Lisa's analysis of what is needed for her and her IMT colleagues to use videotapes of one another's teaching in educative ways.

Lisa's two new requirements for using videotape have strong ties to the relational work of the group. Lisa trusted her colleagues in the IMT group. By framing her viewing session to see what they might see, Lisa was trusting the IMT members to be affirming, to support her work, to attend to her and her practice in ways fitting with their past experiences. But given her additional goal to stimulate a conversation that would push her thinking, Lisa saw the need to frame a viewing session with a question of her own, more specifically, a problem she wanted to investigate. From her first experience, Lisa conjectured that if she posed a question of her practice in public the IMT members would be more likely to join her in inquiry. Shifting the conversational involvement in this way, shown in the analysis above as shifting the conversational rights and duties, may also require developing the trust relations of the group in new ways. For Lisa to pose a question about her practice she must trust her IMT colleagues to support her disclosure of uncertainty about her own work, to listen deeply, withholding judgement and advice, and to respond honestly about what they see, wonder, and understand.

Building and Standing on the Trust of Colleagues

The connections between this deep*trust* and new forms of conversation as a tool in teacher learning is becoming more frequently addressed in the literature on teachers' collegial relations. As educators, we know that trust is critically important to all learning and development. Across all life experiences, we know the centrality of trust to growth in friendship, in business, in parenting--in all sustained human relationships. From our own personal experience we know the dangers and costs to life's quality when trust is lost.

In theories of learning and development, trust is a construct most directly addressed in developmental psychology. Erik Erikson (1968) described the struggle to achieve trust over mistrust as the first critical crisis we must resolve as healthy developing humans. In order to achieve further development we must achieve a sense of trust with those on whom we are dependent and with whom we want to continue interacting. Erikson also taught us that inherent in the ongoing work of identity development we will have to negotiate and resolve crises of trust over and over in the course of a lifetime.

Perhaps trust is showing up as a topic in educational literature because there is a kind of identity crisis, in the collective, as teachers and researchers struggle to develop new identities adaptive to current educational reforms. Teachers are learning to be researchers in classrooms. Researchers are learning to be students of teachers. Both are learning to be colleagues capable of dealing with contradictions and uncertainties when we explore and modify who we are and what we do. Reformers are asking teachers to reconceptualize what it means to identify themselves as teachers and how they describe

the nature of their work. In turn, researchers who are interested in working with teachers as partners in inquiry are also struggling with their identities as colleagues who study teacher learning *with* teachers. Lieberman and colleagues (1988) write that "trust and rapport...are the foundation for building collegiality in a school."

Trust and Dialogue

It makes sense that trust plays an important role in our efforts to learn and enact the principles of collaboration. The collaboration sought by teachers and researchers is centered on open, critical dialogue. In describing the dialogical relation, Burbules (1993) quotes Patricia White's (1990) observations on the role of trust in education:

> Trust has a belief component (as many emotions do): the belief that you can rely on someone or something where there is an element of risk. But trust also involves a feeling, a commitment, that underlies and strengthens the belief that one can depend on another's goodwill (p.37).

Drawing on White's account, Burbules highlights several aspects of trust in dialogical relations. One is the notion that conscious effort is made by the participants in a relation to create a context in which both participants feel safe to offer up their beliefs, and the experiences or feelings that accompany them, even if they may provoke disagreement. A second aspect of developing trust is the importance demonstrating trust, initiating our own personal disclosures, before we ask others to trust us. According to White, over time, the significance of the dialogical relation should engage the participants such that conscious attention to establishing trust can move to the background, only to be nurtured

and maintained occasionally. White cautions that the more attention that needs to be given to establishing and maintaining trust, the more problematic and uncertain the relation is. Additionally, Burbules highlights the especially pertinent risks at stake in dialogue:

> We trust our partners to keep certain things that we say in confidence; we trust our partners to withhold judgement upon some of our comments, at least initially; yet we also trust them to tell us honestly what they think and feel about a topic, even if it disagrees with us. In many ways the fundamental risk in dialogue, especially perhaps in educational contexts, is the risk of extending ourselves outward conversationally, endeavoring to express as well as we can a point of view, belief, feeling, or experience in the expectation that our partner will respond thoughtfully and sympathetically, but not knowing if they will. The dialogical relation needs to be developed over time so that we can establish and sustain this confidence in the reliability of our partners, and they in us (p.38).

A commonality across these researchers' definitions and descriptions of trust is the notion that trust is grounded in a basic reliance on someone or something where there is a felt sense of risk. We know about trust in the interpersonal interactions we have with others and *understanding* it is often assumed because it seems so basic, so simple. But, is it? Is trust so simple to understand when we are trying to significantly alter long-standing roles and relationships between the university and the school, between researchers and teachers? between teachers and colleagues?

Relational Work In Dialogue And Reforming The Culture Of Teaching

Why does the relational work seem so visible in Lisa's moves and in her descriptions of her experience? Why are relational issues bubbling up in so much of the work on educational reform? (See for example, Witherell and Noddings, 1991; Lensmire,

1992; Little, 1993; Hargreaves, 1994.) What is happening in our classrooms and our staff rooms and our university project rooms that prompts us to appreciate the importance of human relationships in learning?

Teachers and researchers engaged in efforts to reform teaching, guided by social constructivist views of learning, are necessarily drawn to examine the complexities of learners' interpersonal dynamics and the ways these dynamics help or hinder participants' learning. In classrooms, teachers struggle to understand students' peer relationships and figure out what it takes to develop learning communities in which children interact with each other as resources and guides for subject matter inquiries. In his study of children's relations in a third grade writers' workshop, for example, Lensmire (1991) describes the influence of the peer culture on the "classroom's official work of producing and sharing texts." In professional development work, researchers and teacher educators grapple with ways to create and sustain collaborations with and among teachers (Little and McLaughlin, 1993; Witherell and Noddings, 1991; Lieberman, 1993; Hargreaves, 1994). Among numerous possibilities for powerful outcomes of collaborative work is the continual development of a teacher's sense that her learning is supported, in critical but trusted ways, by her peers.

Current innovations in professional development work press for teachers to situate their continued learning in their own practices, to talk openly and in detail about their beliefs, decisions, and actions as teachers (Little, 1993; Lord, 1994). Reformers press for teachers to make their practices public. This call is based on principles of

learning that emphasize the importance of making explicit one's understanding and one's uncertainties about the practice of teaching and drawing on the richness of multiple perspectives of others as a resource for continued learning. Much of the writing about this call seems to imply that altering expectations, structures, and activities will result in teachers knowing *how* to create and sustain the intellectual engagement aimed for by the innovations. My work with the IMT group, and with Lisa in particular, has shown me, however, that teachers need vivid images, a range of models, and practical understandings of what deep, trusted, critical support looks like and, perhaps most importantly, what their role might be in creating it.

Trusting collegial relations can be the connector (see Figure 5) between the existing culture of teaching and the new culture envisioned in the reform documents. As teachers trust in the images of what's possible, they have the opportunity to use what they understand about the existing culture of teaching to develop conversational skills that will transform their conversations from shields of privacy to critical examinations of practice. As teachers trust their own conversational capacity to engage in critical conversations, they begin to act according to new norms and to craft for themselves new roles within the culture of teaching. As teachers trust each other as dialogic partners, where judgement is withheld and professional honesty is emphasized, they begin to interact according to the envisioned description of reform-oriented practitioners (Little, 1993; Lord, 1994).

AWARENESS OF EXISTING CULTURE CONVERSATIONAL SKILLS

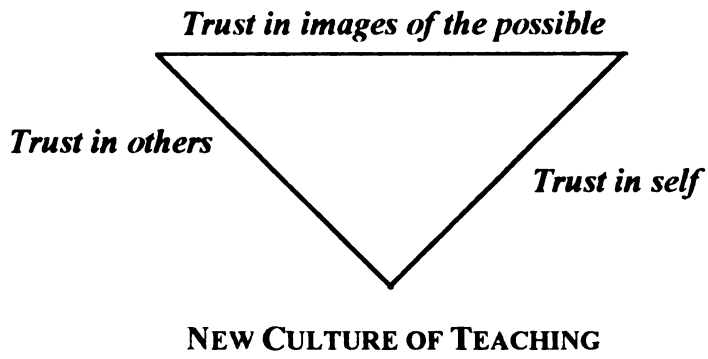

Figure 5. Connections between trust and a new culture of teaching.

Learning About The Culture Of Teaching

Lisa's experience and her sensemaking about it help to identify aspects of the learning that surrounded her attempt at a conversation that was situated and analytical. Throughout her work, I think we see Lisa possessing and *using a tacit knowledge she has constructed about the culture of teaching.* It is tacit knowledge in that she does not talk about rights and duties or beliefs or customary ways of interactions. She does not analyze what is needed in terms of cultural norms, participants' roles, or trust relations. Rather, her words and her actions suggest she intuitively understands what serves as an appropriate approach to presenting her practice to a group of peers, how to present

herself, and how to take and keep the conversational floor, all with concern for preserving the cohesiveness of the group and her good standing as a member.

Lisa was able to launch her efforts at using this new form of sharing her teaching by drawing on an old form; Lisa used her knowledge of and experience with telling stories of her teaching or talking about her practices to design her first sharing of a videotape of her teaching. The way she chose to show her tape, with consideration of the other members of the group, the meeting agenda, and the general open-ended approach to the discussion reflect the existing culture of teaching and the way practices get shared.

Lisa's behavior also illuminates how she is learning about of a different culture of teaching. She described what worked and what didn't work in the IMT meeting in ways that suggest she was comparing the experience with *images of what is possible.* From her early participation with the IMT group she had gained a beginning sense of what can happen in a teachers' conversation that looks critically at teaching and learning and how it can be helpful to her in making changes. She had experienced conversations in the IMT group that were radically different from any teachers' conversation she had had in a school setting. She was developing relationships with these teachers that were different from relationships she knew with other faculty members. She came to the December meeting with images of the possible inquiry that sharing a slice of her practice could offer. She came with a sense for what that conversation would look like, sound like, feel like when they as a group created it. Using this awareness, Lisa analyzed her experience of sharing her videotape for the adaptations needed to achieve the educative conversation she

desires. These images of the possible drove Lisa's interest in this exploratory work and guided her actions and reactions so that she might intentionally create what she had spontaneously experienced in previous interactions. It seems difficult to argue that Lisa could have analyzed and interpreted the experience as she did if she did not already possess this awareness of what's possible.

The call for teachers to become attentive, to become analytical, critical students of their work is a call for an intellectual engagement of the kind traditionally conducted by educational researchers. A first step is for teachers to gain a conscious awareness that their work has cultural definition and direction. Awareness that there is a culture of teaching that directs teachers' ways of interacting and awareness of what is possible when guided by different norms is only part of the work in transforming professional talk among teachers. Lisa's work also illuminates the need for *skills to create and participate in the intellectual work of critical conversations.*

The IMT group and the event of sharing videotape created a context in which Lisa and her colleagues worked on understanding and developing skills needed for a different kind of conversation. The IMT group provided a transitive support community (Bruffee, 1993) for Lisa and potentially for others to construct the knowledge and to develop the skills needed to talk with teachers from a different cultural base. Lisa's sharing of videotape was situated in a group that was working hard to move itself, as a collective, away from the traditional culture of teaching. The IMT teachers identified themselves as a group set apart from their respective home faculties and they saw themselves as different.

And indeed, they were engaging in new work--conversations, storytelling, studying videos, reading, writing—that they were not finding in their home faculty meetings. In the IMT meetings the teachers gave lengthy descriptions of what happened in their classrooms. They talked about what was hard, what was troubling, what wasn't working. They were developing and sustaining relationships they didn't have elsewhere, learning how important a sense of trust is for talking with another teacher (Featherstone, Pfeiffer, Smith, 1993; Featherstone, et al, 1993). But it is not the case that these teachers walked out of the traditional teaching culture, cleanly leaving it behind for another. Made visible in Lisa's foray into using her videotapes is, I believe, the fitful emergence of a new culture and the struggle of individuals who must negotiate their identities and their interactions within it.

Next, in Chapter 4, we will see Lisa situate her skill development for educative conversations about her practice, using videotapes of her teaching to prompt conversations with me. In important ways, Lisa's decision to wait before sharing tape again provided her with time and space and potential opportunities to learn about the kind of teacher conversation she seeks. As her partner in this inquiry, I helped her create a practice context for this work. I served as a kind of "portable IMT group" that could meet with her after school to work on this. I brought with me the history, shared experience, and visions of what intellectual work in a teachers' group could be.

CHAPTER FOUR

Learning A New Kind Of Conversation About Teaching

" ...it never would have crossed my mind to consider what we do in the IMT group [to be] curriculum development, but when you think about what we do, in every sense of the word, it is curriculum."

Lisa, 1-19-93

Teachers talking together about their teaching practices presents a paradox. Teachers are good conversationalists about the daily activity of classrooms, yet deep, educative conversations about teaching are rare, difficult, and risky. Research on teacher's conversations (Little and McLaughlin, 1993; Johnson, 1990; McLaughlin and Yee, 1988; Goodlad, 1984; Lieberman and Miller, 1978) suggest that teachers limit their talk about teaching to generalized comments, reports, and descriptions of successful lessons and the swapping of creative ideas for instruction.

Still uncommon are teachers' detailed discussions of problems in the classroom. Still rare are teachers' sharing of their beliefs and their theories of teaching and learning in ways that support their development as practitioners. Using one's own teaching experience to create educative conversations calls on personal skills not taught and professional norms of interaction not supported in traditional school culture (Little, 1993; Lieberman, 1988).

In a chapter entitled, *Education as Conversation*, Kenneth Bruffee writes a compelling description of the relationship of conversation to learning and the construction

of knowledge. In his simplest terms, "Good talk begets good thought" (Bruffee, 1993, p.114). He argues the position that "we can think because we can talk with one another." Drawing on Vygotsky's demonstration that thought is social conversation internalized, Bruffee writes:

> If the talk within the knowledge communities we are members of is narrow, superficial, biased, or limited to cliches, our thinking is almost certain to be so, too. Many of the social forms and conventions of conversation, most of the grammatical, syntactical, and rhetorical structures of conversation, and the range, flexibility, impetus, and goals of conversation are the sources of the forms, conventions, structures, impetus, range, flexibility, issues, and goals of thought (Bruffee, 1993, p.114).

With an aim to engage teachers in situated and detailed conversations that employ forms, conventions, and structures of close scrutiny of actual practices and a goal of similarly critical thought in action, educators are challenged to create opportunities and contexts for teachers to observe, model, and practice such conversations.

In this chapter, I look closely at a set of conversations I had with Lisa during January and February of our year together for what they illuminate about a teacher's learning of a new kind of conversation about teaching. These opportunities came in the aftermath of Lisa's sharing a videotape of her teaching in an IMT group meeting and her decision to wait before sharing tape again, until other teachers in the IMT group had done so. Contributing to her decision to wait before showing tape again, Lisa wanted to think more about what question--or, as she called it, "video dilemma"--she would take back to the group when she did share tape again. How might she engage the group in a "deeper" analysis?

In January, 1993 Lisa and I met for two 3-hour meetings. We met in her classroom at the end of the school day and we brought the videotapes from December, our notes, our journals, and our current thinking about using videotapes and about recent events that were influencing our ideas. These meetings illuminate Lisa's efforts to try out ways of framing a teacher's conversation as an analytic, critical close look at her practice. In the conversations, we used instances from her own recent teaching as the site for investigating what she and others understand, believe, ponder, and do to create a reformed mathematics teaching practice.

Through Lisa's experiences in an alternative undergraduate program and opportunties through her continued connections at the university, she was already committed to the use of conversations about teaching as a valuable tool in learning to teach. But knowing that they are important and becoming knowledgeable and skilled in how to create and sustain them are separate achievements. In the three vignettes to follow, we see Lisa shape our conversational workspace to work on various aspects of dialogic participation specific to an exploration of teaching: (1) practicing the skills of articulating what she wonders about in her daily practice, (2) framing questions about the fit between belief and action in her pedagogical moves, and (3) negotiating for herself new meaning for language she must use in talking with other educators.

Conversational Workspace 1: Learning To Articulate Questions About Practice

Lisa started the videotape and let it play as we settled into what we expected would be a long conversation. We ignored the audio and glanced at the action as we talked about other things. Here and there a visual image on the screen triggered a comment or question. I saw Mandy, for example, and asked how she was adjusting as a new student in the school. Lisa reported that Mandy was doing well, but that she was worried about another new student, a boy, who seemed really sad the last couple of days. As images of her students passed across the screen, Lisa vented her frustration with trying to help another student who seems to be forever complaining and putting herself down. She joked about a hidden advantage in working with videotape, that it's fun to be able to stop the action or look again; and sometimes, it is just fun to fast forward over it all!

Lisa fast forwarded to the segment she had shared in the December IMT group meeting and said that she wanted us to watch the same clip. It had been almost a month since I had been out to visit Lisa at her school and longer since I had seen the students. As I watched, I could feel my own connections to individual students and to the personality of the class as a group reawakening.

The tape continued to play and Lisa and I continued to talk as if it was providing background music to our conversation. With an eye on the monitor and both of us still opening notebooks and finding pens, Lisa provided me with an update on what was currently happening in the classroom. Lisa described her efforts to again "get them

cooking in decimals" after the holiday break and her intent to move into the multiplication of decimals by first revisiting the multiplication of whole numbers. She talked about how it felt like slow going and that one challenge was introducing and practicing new vocabulary necessary for having these discussions. Her assessment was that the discussions don't feel very adventuresome: "They just feel dead."

"Oh, here we go." Lisa raised the volume on the audio and we turned our attention to the video. We watched and we continued to talk, now recounting the IMT meeting when Lisa showed this clip of her classroom. The videotape continued to play and Lisa reflected again on the opening conversation with Sheryl in the IMT group. I was aware that we were watching the tape but it was not clear how it was functioning in our conversation. We certainly were not studying it. As we continued to our conversation, as if we were also occasionally attending to a old television rerun, the voice of Jamie, a leader in the classroom, drew Lisa's attention to the monitor and she laughed, "Sometimes, I hear Jamie's voice and I think it is *me*."

We both became engaged with the activity depicted on the screen and we watched more attentively as Susan prompted her classmates, "It's like--'member when we were doing the which is greater, .51 or .511 and they were --er--it wasn't that--it was like some number with a zero on the end and they took the zero away and they said it was still the same thing."

Lisa stopped the tape and she said to me:

> It's sometimes interesting when they refer back to other discussions. And I'm always wondering what they're going to say. Like, what their

recollection of the previous discussion.... Like, are they going to say somebody's argument, or are they going to—like when she said, 'One had two numbers and one had zero on the end and they took off the zero and it was still the same.' Who's 'they'? Who [is she] thinking of? Class in general? Or, does she remember somebody doing that and somebody proving it? What do they take away from that discussion? Because, I think about the kids like, at the end of the year, they still say, like, when they give me advice for what I should do next year, they say, 'well, you know, I really think you should give the kids the answers because we really never knew what the right answer was.' So I'm always wondering when kids feel comfortable that they know if it's right or not. Like, do they ever, I'm always anxious to hear, do they ever say, 'when we decided that they were the same.' Or I'm afraid to hear, 'Well, Mrs. Pasek told us'. If I seem to be in agreement that they're the same, do some kids interpret that as, 'okay, it must be right, because Mrs. Pasek is agreeing or she seems to be agreeing.' Or, I guess it's, you know the mathematical--who decides mathematical validity? And it comes out, it could come out when they talk about previous discussions, but I am never quite sure.

I commented to Lisa that it seemed the students in this class do a lot of the referencing she has observed. Here, they referred to a previous class session. And at other times I had heard them refer to other school years and other teachers.

Lisa agreed that the students do draw on other sources. She added that at least weekly, someone will say in class, "Well, my mom showed me this", or "I remember this from before." She noted that this was good because it showed they were taking the "initative to seek out other sources." Lisa then told of a boy in her class who had asked his mom about the problem $8 \times 5/8 = 5$:

Lisa: He had asked his mom, I asked them, we were talking about whole numbers times decimals and I was having them put up problems that they thought were interesting that we could discuss, and see if they made sense. And one of the problems was eight times five eighths equals five. And it was kind of at the end of the hour and I asked them if they would--we talked a little bit about it and I asked them if they would show a

representation of it. And that same boy had asked his mom--it was funny, because the way he worded it was so cute--he said, 'I asked my mom how she would make sense of eight times five eighths equals five.' Just the way, 'how she would make sense of it.' Not, 'how she would answer it', you know. Because they had to draw a picture, maybe that helped. 'How she would make sense of that.'

Lauren: Picking up your language.

Lisa: Yes. And probably that was different than if I had asked them to solve it.

Lisa began the videotape again, marking the end of this segment of our dialogue and redirecting us back to the classroom record to see what else we might see. Lisa's use of the videotape in this dialgoue resembled her use of it in the IMT meeting in December. We seemed to be exploring the tape to see what might be provocative, interesting to comment on, or puzzling to investigate. However, our interaction differed from the IMT meeting in an important way. In our viewing session here, Lisa stopped the videotape to raise with me something she was wondering about. In this way, our work seemed to align with Erikson and Shultz's (1981) approach to videotape viewing sessions. I think what we were engaged in builds on Erickson's and Shultz's analysis protocol in that the images served to contextualize a new conversation about teaching; what we talked about was not directly observable in the video record.

Our dialogue about the struggle to understand the children's use of language for what it might tell us of their sense for mathematical validity lasted four minutes. But in this brief exchange, Lisa used her videotape to situate our conversation in a way that

seemed productive to her and seemed to assist her in articulating a line of thinking she had been considering over time. In one conversational turn, Lisa used six different phrases that repeatedly conveyed that what she was describing is part of her in-action wondering about what her students mean when they say "they":

It's sometimes interesting when
... And I'm always wondering
... So I'm always wondering when
... I'm always anxious to hear,
... Or I'm afraid to hear,
... but I am never quite sure.

(transcript 1-12-93)

Lisa seemed to be acting on her desire to revisit the videotape for questions she might pose to the group that would push her thinking beyond a show-n-tell. In our telephone conversation on January 6, Lisa had said, "...it would be interesting to go back to the same tape and have a question. Get at the same thing. Look at the same thing and dig deeper, or um, kind of open up to be pushed a little bit about..." In deciding to watch the same segment of videotape when we get together, Lisa seemed to move strategically toward her goal, "mustering resources" (Featherstone & Smith 1996) that would help her return to the group and use videotape in a more analytic way.

Indeed, she seems to be *tailoring* a resource she already had--our collaborative study--to learn how to identify and articulate her uncertainty about this discourse-based approach to teaching. Lisa knew I was familar with her classroom and her teaching and this particular videotaped class. Perhaps this sense of familiarity, a viewing feature she

referred to in her reflections on sharing tape with the group, encouraged our use of the tape as more of a stimulus for dialogue about teaching than as a show-n-tell example of her practice. But I also think her new awareness about her needing to raise a question or frame an issue was shaping our work in this viewing session.

In the IMT meeting in December, Lisa had shown the tape and waited for the group to respond. Here, she stopped the tape and pointed to a specific instance of classroom activity and then used that instance to engage me in dialogue about the challenge of understanding her students' thinking by studying what they say in class. She questioned what she can interpret from their comments. In other words, she moved again, *strategically* to create a dialogue that would be productive, educative for her. By posing the questions, for example, "Who is 'they'"? and ... "Who decides mathematical validity?" Lisa was working actively to engage a reciprocal set of rights and duties within which we both could wonder about and investigate a vision of reformed mathematics teaching, situated in her practice.

In his chapter on the rules of the dialogue game, Burbules (1993) draws on Habermas' (1984) theory of communication to show how dialogue is situated in a relational context, that it is grounded "in conversational processes of persuasion and intersubjective explorations" (p.75). Habermas identifies "strategic" forms of communication and "communications oriented toward understanding." Strategic forms of communication, like the example above, concern purpose and ways of getting--in a speech act--what one needs or desires. Communications oriented toward understanding are

linked to a commitment to validity claims of comprehensiblity, truth, sincerity, and rightness.

In addition to its strategic features, Lisa's choosing to re-view with me the same segment of videotape she showed to the IMT group reflects communication oriented to understanding. She used the videotape as a tool to help her communicate her thinking about a complex aspect of her teaching. That is, Lisa used the videotape to point out an example of student talk and then used that example to begin working with her uncertainty in understanding that talk. By trying to help me understand what she saw on the tape as an example of students building their authority with their peers, Lisa worked on getting clearer for herself what that looks like and how to talk about it. So her work was two-fold: Lisa was explaining to me the students' thinking and she seemed interested in my thoughts. Moreover, she seemed to be practicing her articulation of a complex aspect of her work that she has mostly wondered about privately. She moved her thinking into a public space (Harre, 1984). Revisiting Duckworth's description of the power of verbal explanation, Lisa was deeply engaged in *sensemaking*. Our conversational workspace was supporting the social "public" context in which she could construct meaning.

I think it is important to reiterate that the videotape served as a stimulus for our conversation; the substance of what Lisa and I talked about was only prompted by the example she saw in the video. The videoclip image helped Lisa articulate how she thinks about trying to facilitate students' taking an active role in deciding the worth of ideas an conjectures posited by their classmates.

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It is one of Lisa's aims that the students will come to see one another as resources for their own learning. In the *Professional Standards for Teaching Mathematics* (1991), this aim is stated as a standard which shapes a new and different role for students in the classroom:

> ***STANDARD 3: STUDENTS' ROLE IN DISCOURSE***
>
> ***The teacher of mathematics should promote classroom discourse in which students–***
>
> - ***listen to, respond to, and question the teachers and one another;***
> - ***use a variety of tools to reason, make connections, solve problems, and communicate;***
> - ***initiate problems and questions;***
> - ***explore examples and counter examples to investigate a conjecture;***
> - ***try to convince themselves and one another of the validity of particular representations, solutions, conjectures, and answers;***
> - ***rely on mathematical evidence and argument to determine validity.***

Figure 6. Visions of the students' role in discourse.

(From National Council of Teachers of Mathematics, 1991, p. 45)

Susan's comment, ("Remember when they took off the zero...") is an example of the student talk Lisa listens for in wondering about who or what counts as an authority to her students in a mathematical discussion. Using what Tannen (1989) calls *constructed*

dialogue, Lisa talked through with me what her students say, what she listens for (e.g. "when *we* decided..."), and what she fears hearing ("when *Mrs. Pasek* told us...").

Prompted by the example on the tape Lisa made explicit the complexity of helping turn students away from the teacher and books as their only authorities in the math discussions and of encouraging students' ideas, conjectures, and arguments as resources for one anothers' understanding. Through her talk, she gave meaning to a standard she knows as a key principle in the reformed view of mathematics learning in school. Looking again at Lisa's words illuminates how she was working on—practicing—how to link her understanding of a particular instance in her classroom to a standard that she knows to be central to the reform oriented practice she is creating.

> *"...I'm wondering who is "they"...*
>
> *...I am always wondering when kids feel comfortable that they know if it is right or not...*
>
> *...I guess it's the mathematical--who decides mathematical validity?"*

In this talk, we see Lisa move from a description of her experience to a rough version of the question to a formulation of the big idea, as she has read it in the reform literature (NCTM, 1989; 1991). She began literally, *wondering* what the children mean when they use the reference "they." She then *explained* what she means when she says

she is "wondering." And in the last turn, she *linked* her wondering to language she has read and heard used by reform-oriented educators. She constructed meaning for a statement included in the *Standards* vision of mathematics teaching *(try to convince themselves and one another of the validity of particular representations, solutions, conjectures, and answers)* and this meaning was situated in her own classroom experience. When Lisa said, "I guess it's the mathematical--who decides mathematical validity?" she linked this aspect of teaching for understanding to what happens in her own classroom, what it looks like for children to take responsibility for determining mathematical validity.

Conversational Workspace 2: Learning To Be One's Own Knowledgeable Other

Lisa's vision for her classroom includes having her students feel valued as thinkers, "where [they] have a chance to think mathematically and have ownership of their ideas and feel empowered and in control over deciding what makes sense and what doesn't." (interview with Lisa, August, 1992). Understanding her role in fostering this ownership and empowerment in her students and knowing how to enact it is not easy.

The National Council of Teachers of Mathematics describes the teacher's role in discourse as follows:

STANDARD 2: TEACHER'S ROLE IN DISCOURSE

The teacher of mathematics should orchestrate discourse by –

- ***posing questions and tasks that elicit, engage, and challenge each students' thinking;***
- ***listen carefully to students' ideas;***
- ***asking students to clarify and justify their ideas orally and in writing;***
- ***deciding what to pursue in depth from amng the ideas that students bring up during a discussion;***
- ***deciding when and how to attach mathematical notation and language to students' ideas;***
- ***deciding when to provide information, when to clarify an issue, when to model, when to lead, and when to let a student struggle with a difficulty;***
- ***monitoring students' participation in dicussions and deciding when and how to encourage students to participate.***

Figure 7. Visions of the teachers' role in discourse.

(From National Council of Teachers of Mathematics, 1991, p. 35)

Deborah Ball, (1996) a participant in the writing of the *NCTM Standards*, writes about the undetermined nature of the guides and the challenge they pose to teachers to situate the vision in their own practices and to articulate for themselves the meaning these standards have in the particulars of their classroom.

In Ball's words:

> [I]t is not just that the reforms represent dramatic changes in belief and ideology that makes the changes evisioned complicated to attain. The reforms are also undetermined guides for the minute-to-minute, day-to-day work of practice.... Even when supported with detail and image, these visions cannot show teachers what they should do with particular students, around particular topics, in a specific school community. The ideas of the reforms--the portraits of the possible, images of the future--are resources for practice not prescriptions. Nor will we ever reach a state in which those prescriptions can be authored (p.4).

Lisa was attempting in our work together to draw on the videotaped images as a resource for her practice. We finished reviewing the fifteen-minute video segment Lisa had shared with the IMT group. I suggested we continue by watching the next day's math class. Watching the videotape, Lisa observed herself writing on the board a conjecture offered by Allen, one of her sixth grade students. She said to me:

> Lisa: ...Another thing that I noticed is that um, a lot of times, in Deborah Ball's classroom, she would write up conjectures or write up problems that people were giving examples of. And it seemed to just flow right in and I don't know if it's me, I guess I'd have to look at different examples of it, but I always feel like, even to just do that, it takes the ball away, to an extent.
>
> Lauren: To do what? To take their conjecture and put it up on a piece of paper, on the board?
>
> Lisa: For me to say, okay, your example is this, and for me to write it.
>
> Lauren: To restate it. Yeah.
>
> Lisa: I just kind of feel like.... But I've seen it, other people do it. Deborah is writing up problems and it doesn't seem to affect, so I don't know if it's just my perception or I feel like I'm getting too into it.

Lauren: You're talking about when you restate the idea or even just putting it on the board for them.

Lisa: Yeah.

Lauren: That's sort of interesting to me given that I just taught that class this morning and how much I caught myself being aware of that and restating people's ideas and trying really hard to literally restate what they were saying for the group. I guess I think about that as facilitating and orchestrating. Um, but I can see the question of how much is that infringing upon their ownership, of it being their idea and they already made the statement, so why are you dancing on my statement.... But at the same time, I guess I find myself doing it, or seeing Deborah doing it as a way of um, sustaining the thought. Keeping it from being lost or somebody having only heard half of it. I don't know. I guess I don't think about it as being too infringing but I can see where that's a question.

Lisa was articulating her concern about the message she is sending to her students when she restates their ideas. She had observed other teachers document students' contributions in class. Specifically, she had watched videotapes where Deborah Ball writes a student's conjecture (e.g. Any number below zero plus that same number above zero equals zero.)[10] and posts it in the room where students can refer to it, comment on it, and offer evidence to support or refute it.

For Lisa, observing herself making the same sort of move raised an issue that hadn't come up in her observations of others. She noted that when she restates or writes out a student's idea, it doesn't feel as smooth as it looks for others. She offered qualifiers

[10] See Ball (1990) for a description of her third graders' work with this conjecture and "the dilemmas of her role, of authority for knowledge, and of the clarifying/confusing tensions inherent in group discussions..." (p.19).

for her uncomfortableness ("I don't know if it is me...maybe it's my perception), but her concern was that she might be jeopardizing her student's ownership of ideas—"taking the ball away"—and this is a feature of her classroom that she values deeply.

Lisa's concern was also an investigation of the fit between her actions and her purposes. We worked together to lay out the multiple cuts she might take on this dilemma. Lisa tried on another example, not viewed on the tape, but prompted by it. She said:

> Lisa: Like, today there were some problems and I come in and jump in and say, okay, let's write that one up on the board and I wrote it up on the board and I kind of felt like or maybe it's just me being leery of that feeling of whenever I'm up on the board I'm going to start talking too much, I'm going to start taking over. Or maybe it doesn't happen, it's just my perception. Because like, in one class, they were having trouble getting started with some problems. So I kind of led the class through like, 'try this one, what do you think it would be? Try this one. What do you think it would be?' Two times three tenths, two times three hundredths, and I kind of gave them a model and I felt like it was very directed. I think that was what they needed to get them to handle the strategy for looking for patterns.
>
> Lauren: Which reminds me, as we've said before, sometimes it's appropriate to be directive. So, sometimes it's calling that right shot.

Like the first example in this chapter, Lisa was creating for herself a dialogue that would support her practice with framing and articulating a dilemma stituated in her practice. The videotape played an important role in representing her practice, stimulating

her thinking and drawing me in as a dialogic partner. Once again, she seemed to be approximating a different set of rights and duties (See Table 4 on page 120) than had shaped and bounded her conversation in the December IMT meeting.

This second example is helpful in another way. It serves as a context for looking closely at analysis skills Lisa was acquiring through her dialogue with me around her videotape. Lisa began by analyzing her actions in the classroom for the possible messages they send to her students and how these messages may affect the roles she is trying to craft for them and for herself. By talking through her observation, Lisa shifted the focus of her analysis away from what her writing on the board might convey to her students and she began to question her insertions, her restatings, her possible stepping on student's talk. She recognized and articulated how being at the board to document a student's ideas, also physically positioned her to talk to the whole class--a classic image of the teacher "teaching" and in Lisa's words, "taking over the discussion." This shift in the focus of her talk seems to represent the kind of "digging" in that Lisa seeks.

As we talked, Lisa repeated her qualifier, "perhaps this is just my perception." I see this moment now as a missed opportunity. It may have been fortuitious for either of us to suggest that we study the tape—segmenting it, reviewing it—to assess the extent to which she *is* talking at the board, to investigate her speaking turns for their duration and their content (Erickson & Shultz, 1981). To do so, would have further supported her analysis and helped her connect images and language to her understanding of the standards she enacts.

However, from another angle, having missed this opportunity, Lisa continued casting a wide net in exploring her practice. She drew on another story of another instance that fit with her query about physical moves and their messages. Her perception of this second instance was that she had been *directive*, a debated, bad word for many teachers struggling to embody the standard for children's active leadership in classroom discourse. Lisa offered a rationale for her move, but she added that she feels uncertain about its impact and its cost to her goals. In this next segment of our dialogue we see Lisa continue to analyze her use of directed dialogue, and the reasoning behind her decisions to make such a move. She said to me:

Lisa: Maybe, ...Because it always feels very easy to get into. You just kind of fall back into it.

Lauren: Fall back into it as in old traditional ways? Fall back into what?

Lisa: Fall back into, I'll say this, you say this back. I'll say this..... Or even um, hmmm, or sometimes when I'm, and maybe I use it too when kids are stuck in, because today the kids, we had a half hour switch and it was hard to get going and sometimes if I feel like the kids are sort of sleeping, I'll ask a question and they all should be able to answer, and I'll say, 'Say it if you know it', and encourage them to chant, or whatever.

Lauren: At least you don't make them stand up next to their desk.

Lisa: Yeah. 'Four times seven, say it if you know it.' It kind of serves a purpose too, to get the blood pumping. I am actually um, working a little bit on times tables using the meter tape, because we're getting into fractions and they're going to be finding common denominators and thinking about how to split these fractions into same size pieces. There's a lot of kids that don't know their times tables. So that's like, my meager attempt.

Lauren: To drill?

Lisa: Yeah. ...count by sixes and sevens.

Lauren: Great. I think that's a neat idea.

Lisa: I don't know, it's interesting to catch myself going, six and seven is.... And I made it this far.

Lauren: Now wait. I want to ask you a question. This is an interesting topic here, you're feeling like that's--are you--that's what you were feeling when that was going on, or are you looking at that now saying, 'Oh gosh, I wish I wasn't doing that'?

Lisa: I think, I don't remember what I did after this, but I seemed to remember feeling like, because I kind of jumped right on when he said, 'Zero minus one. And I figured that probably meant... But I kind of jumped on that, when I said, 'Is this what you meant'?

Lauren: And you wished you hadn't done that?

Lisa: Well, I think I remember feeling like I kind of jumped in. Where, if he had just explained a little bit more, or having him explain and then having other kids question it if was still not making sense. Kind of trusting other kids would flush out if it was still not making sense. Instead of thinking that I have to be the one to jump on him and say, 'What do you mean by that? Are you sure that's how the number line should go'? I mean... Because that would be easy to do and I'm wary of that. I guess any time I start talking a lot with chalk in my hand.... I'm leery of falling back into.... I guess if you had, like, if you looked at, if teachers did some kind of um, research that looked for behaviors or tones of voice that triggered falling back into old modes. That having chalk in your hand, or standing up in front of the class. There would be certain behaviors that might trigger it.

Lauren: Trigger "it"?

Lisa: Trigger it.

Lauren: "It" is falling back into old ways?

Lisa: You would sense that behavior as saying, 'That's right, I want to do that', and then go back and .... But, I guess, I know that that's one behavior that can trigger that. So I'm always leery of it. Even if I deliberately choose to have them chant. 'Say it if you know it', kind of thing. It's something that I'm really leery of because I know once I get that chalk in my hand, if I just let loose, I could be writing on that board and just have the discussion all by myself.

In this dialogue, Lisa grappled with a couple of things. First, it was her aim to turn the classroom discussion over to the students and to facilitate their interactions, by listening carefully, asking questions, and inserting ideas and alternative frames, as well as additional information. She explored here, 'What does that look like in action? Is that what I am doing? Or, is something else happening as a result of my moves?' Second, Lisa made explicit her struggles with deciding when to step in, and when to step out and let the students "flush out" the meaning.

As we continued to watch and to talk about these issues, Lisa extended her investigation further yet. While still grounded in uncertainty, in her struggle to align her beliefs and her actions, she observed a "good fit" :

> Another thing I was thinking: how hard it is to make up things as you go. Just then (in the tape), deciding that I wanted them to write and trying to figure out what I wanted them to write about. As I was watching it I'm thinking, 'Oh, good move Pasek, pulling it back to the original problem and having them go back and... good move.'
>
> And I was thinking about--we had an assembly today and the guest speaker had been giving presentations all day long; that's her job, giving presentations to all these different schools. I was watching her during our session and thinking wow, she's really got it together. It just flows really

> well. She knows just the right analogies to use. She's really got her act together. Later, when my kids were in music, I stopped down by the gym and I heard her telling the same jokes. Then, when my kids were at recess, I was down there again and I heard her presenting to another group. She was going through the same play by play, the same sequences, the same jokes, the same strategy; no matter what age level or group was in there. She did an excellent job. She didn't look rehearsed. It looked very spontaneous. Now, watching me on this tape struggling in the moment: "Write--about--how--this--connects"; I'm really struggling to make it up right there and making it seem like you know what you want them to do.

Lisa was grappling with constrasting images of herself as teacher. A residual image from Lisa's apprenticeship of observation (Lortie, 1975) is that of a teacher whose "really got her act together."

Conversational Workspace 3: Learning New Meaning For Familiar Language

Our second meeting in January was different from the first in that we got together again to watch tape, set it all up, but never actually did so. Instead, we picked up our conversation where we ended it the week before, and our memory of the recorded images seemed to serve as a stimulus for our talk about the videotapes, what was on them, how Lisa was drawing on them in daily situations, without literally reviewing them.

Our meeting on January 19th began with Lisa telling me about the masters course in which she was enrolled at the university. The course was pushing her to examine her practice and her role as a *curriculum developer*. As Lisa explained it, it seemed to her the focus of the course was more on teachers becoming curriculum developers--for other

teachers--rather than thinking about themselves as classroom teachers who do curriculum development as a part of their ongoing work.

It was clear that Lisa was troubled by the perspective she was encountering in the instructor, in the text, and in some of the other enrolled teachers. Having attended one class session, she was raising questions about how her work with the IMT group, her conversations with me, and her study of videotapes of her classroom were *a kind of* curriculum development, but what she meant by that was, in her view, different from what her course instructor was advocating. Between our meetings on January 12 and January 19, Lisa had noted her concerns in her journal:

> *--Frustration with curriculum class!! How to make sense of how this project can fit into the constraints of this more traditional form of research on curriculum. How does this project help me to think about curriculum as a more wholistic endeavor...*
>
> *Implementing a curriculum...Reflecting in and out--How might this project have an impact on my role as "teacher-leader"? --other than prompting others to consider the benefits of rethinking --thinking more deeply about their own practice.*
>
> **My role in my district...*
> **How does this project/IMT membership help me become...*
> *a curriculum developer of some kind???*
> **Teacher*
> *- objectives taught in an alternative way*
> *-belief systems*
> *-math-not a dish it up and pass it out to others*
>
> *(Lisa's journal, January, 1993)*

In our conversation, Lisa worked to articulate her understanding of her role in

curriculum development guided by her belief that curriculim is an emergent process, created with her students in response to their interests, needs, and chosen paths of inquiry:

Lisa: At this point--I guess, because it is based so much on a belief system, it almost cheapens it to call it a curriculum. To say that this is a curriculum that I developed, it almost cheapens it to sounding as if it were something I could package for you and hand out to you, to look over "my curriculum." That's the traditional [view]: 'Well, if you have a curriculum, let's see it. Let's see how you teach decimals; let's see your worksheets; let's see your scope and sequence.' Curriculum is often a word that kind of--it always seems to be some *thing* that is dished up and passed out. So, the work that I do with the IMT group doesn't seem like curriculum work because people have to--come in and cook with us. (pause)

If you would ask me to describe what I do with the IMT group, I would have never, ever gotten to the point where I said, "We develop curriculum." I would have *never* said, "We develop curriculum." Because groups that develop curriculum get release time or stipends to go to a meeting and work on something that is a package deal that they can Xerox and send out. And so, I would have never thought of the IMT group as creating curriculum because--(pause)

Well, it *is* what we do, but it is not that kind of what we do. Just right now, I'm thinking I guess we do create curriculum, but it's still not the kind we can dish up and pass out. It is still different. I still wouldn't feel comfortable telling anyone else outside the group that we develop curriculum, because they would envision us sitting around making up questions, books, and tests to pass out as "math this way" kind of thing...it's the baggage I don't want to deal with--(pause)

It is consuming for me to think about. I am surprised I guess, that it never would have crossed my mind to consider what we do in the IMT group...[is] curriculum development, but when you think about what we do, in every sense of the word it is curriculum.

This transcript of Lisa's extended turn, marked off into four segments by pauses in her speech, makes visible Lisa's active engagement with the meaning she gives to the concepts *curriculum* and *curriculum development* and how these concepts fit in her vision of teaching. Again, drawing on constructed dialogue (Tannen, 1989), she worked through what some generalized 'they' might say about curriculum (e.g. 'Well, if you have a curriculum, let's see it. Let's see how you teach decimals; let's see your worksheets; let's see your scope and sequence.')

As she tried on these other perspectives, she bumped up against a rub between the concept she holds in her head for the traditional use of these terms--how they are being used in her university course--and what she does as a reform-oriented teacher and as a member of the IMT group. In this excerpt of talk, we can see Lisa change her mind, that is, change the meaning she gives to these terms and the work they represent. She seemed to reconstruct her meaning for these terms, shifting from curriculum as a product to curriculum as a process, a term she could use to talk about what, in part, the IMT group does on Thursday evenings.

Lisa seemed to struggle with the contradictory assumptions beneath various uses of the terms. She explained how the view of curriculum development reflected in the course survey she took was "very traditional" because it began with the assumption that curriculum was created for teachers. In contrast, Lisa was working with an assumption that teachers should necessarily create their curriculum in response to guidelines and standards and the particular needs of a

group of students. She was grappling with the notion that someone outside of the classroom could do what she viewed as an inside part of her teaching.

The confusion Lisa confronted around these terms, their concepts, and their direct relation to her work are not surprising and her frustration can be readily understood. She had been reading and referencing texts that used curriculum to mean a dynamic, developmental process that actively involved the teacher, the students, and the material to be learned. Now, her new course was prompting her to examine closely her use of the language of curriculum development and the meaning it has in her work.

In the first chapter of their book, *Teachers as Curriculum Planners: narratives of experience*, Connelly and Clandinin (1988) list nine different definitions of curriculums taken from "reasonably well-known writings in the field." The authors make the point that the range of definitions on curriculum stems from the range of foci people use to describe the classroom and its processes. They encourage the reader of their book to link "curriculum" with a picture in mind in which persons, things, and processes are in interaction. They emphasize that this is quite a different thing from having "a textbook flash to mind or a teacher lecturing flash to mind or an evaluator measuring intended learning outcomes flash to mind" (p.7). It is important to note that this book was a primary text for the course Lisa took the previous semester, in the fall of 1992.

In the Curriculum and Evaluation Standards for School Mathematics, the companion document to the Teaching Standards, published by the National Council of

Teachers of Mathematics, curriculum is defined this way:

> **Curriculum.** A curriculum is an operational plan for instruction that details what mathematics students need to know, how students are to achieve the identified curriculuar goals, what teachers are to do to help students develop their mathematical knowledge, and the context in which learning and teaching occur. In this document, the term descirbes what many would label as the "intended curriculum" or the "plan for a curriculum."

Reconstructing her meaning of *curriculum* in this moment did not resolve all Lisa's concern. But, doing so did seem to draw out more of the complexity in her thinking about this problem with the language. She seemed to be trying to embrace a wider frame of reference (Elbow, 1986) for this language of curriculum. She continued to hold onto what she saw as two views, working out for herself the fit between what others say and what she would or wouldn't say. And then there's "baggage." It is the baggage that comes with the language that Lisa said was consuming and something she didn't want to deal with it. It is the baggage, I would argue, she is dealing with in our dialogue and in doing so, constructing for herself a deeper understanding of her work. Tannen writes:

> Both the meanings of individual words (indeed, as frame semantics and the philosophy of Heidegger and Wittgenstein have made clear, words can have meaning precisely because of their associations with familiar contexts) and the combinations into which we can put them are given to us by previous speakers, traces of whose voices and contexts cling inevitably to them (p. 100).

Again, we are reminded of the notion that the communities in which we participate, shape and direct the meanings we construct. And I think we see in

Lisa work the struggle to move between communities and to construct new meaning.

What Counts as a Conversation Around One's Videotape?

This third conversational workspace is set apart from the other two in this chapter. Lisa and I engaged in a larger conversation that includes this dialogue with the same understanding from the week before that we were meeting to watch videotape of her teaching. Indeed, we never actually used the videotapes. I think this discrepant event affords us now a couple of interesting insights. Lisa framed our conversation so that we were talking about her practice, drawing on her recent experience in a university course and images we share about her practice. The videotape, in its case, on the table, seemed to serve as a symbolic representation of her practice, of which, we were both familiar with its images and its relation to her membership in the IMT group. She was again, *tailoring* a resource she already had—our collaborative project—to learning how to identify and articulate her wondering about this approach to teaching.

Conscious of my commitment to following Lisa's lead, to supporting her taking ownership of the videotapes and the direction of our talk around them (the initiating goals of my study), I was ready to join Lisa in this tailoring. I wanted to support her initiative in framing our work and I responded accordingly by offering my observations, questions, and conjectures. In the midst of this interesting exploration, I felt pulled to link our conversation to the "original" framing that including the tape as a tool. I think this last

part of our dialogue, holds an interesting illumination of our conversational work and our growing perspective on "mining videotapes" (Denyer and Pfeiffer, 1996) as a tool for exploring one's teaching:

> Lauren: It suggests to me that "curriculum" might be a lense that you take to watching the videotapes. Where in these tapes would I say, 'I call that currciulum development or I am working with the curriculum or there is an example of my definition of curriculum development as I have been trying to think about it...?'
>
> Lisa: Yes, yes. The whole idea of having a question, those objectives forming those questions, the placing of questions, the laying out of nuggets for kids to think about; all the decision making, you could make a real argument for this kind of teaching being *a continual process of curriculum development*--the videotape is evidence of curriculum development-in-action.

Lisa was struggling to fit her sense of the "traditional view" of curriculum as an object and her experience with curriculum as a process. She was making new connections between her view of curriculum as a continual process that is co-constructed with her students and the work she does in the IMT group. Together, we were constructing a understanding of the way videotapes of her teaching might be used as a tool in her practice, as a site for studying her "curriculum-in-action."

Learning About Teachers' Conversations

Lisa was using and developing the skills she needed for a kind of conversation that reached beyond the surface elements of reporting, describing, and noticing. She was learning to articulate an aspect of her classroom (understanding her student's reference to "they" as an indication of conceptual ownership) that piques her curiosity, something for which there is not a clear, concrete answer. With the video record and our "conversational workspace", a context that included our shared history with the IMT and our shared interest in mathematics teaching, Lisa was able to explore, try out, practice, and work through a way of talking about this curiosity. Her purpose for engaging in this conversation was not an expressed interest in learning to have a different kind of conversation about teaching. Her goal rather was to watch her videotape and talk with me about it, originally in agreement to help me explore the question, What does a teacher learn from conversations around videotapes of her teaching? While she may have learned something about her students' reference to "they", the analysis of her repeated articulation of her curiosity suggests she was also working on the articulation and framing of a question she could potentially take back to the IMT group and use to create another conversation around her videotape that results in deeper inquiry or "digging." While she may have gotten a little clearer on managing the dilemmas that surround her role in the classroom, she was also examining the fit between her beliefs and her actions, a skill that I would argue contributes to her enculturation in a secondary discourse of reform-oriented

teaching. And finally, while seeking support for her feelings of frustration when talking with peers who hold a different perspective than she, Lisa was constructing new meaning for her concept of curriculum. I believe we were engaged in a "boundary conversation" (Bruffee, 1993) that approximates the transitional support needed for transformative learning.

CHAPTER FIVE

Learning About Oneself In Learning To Teach

"Trust in yourself that you have solid reason for your actions, trust in yourself that whatever happens, you'll figure it out—or at least try to. Trust in those around you., that they'll help and support you in whatever way they can....

...if there were no audience with which to share and collaborate, all my work, alone in a vacuum, would seem unimportant and not nearly worth the effort!"

Lisa, 5-4-93

In a newsletter addressed to the students, parents, and staff of Central Park East Secondary School in Harlem, New York, Deborah Meier describes what it means to be "well-educated":

> ...getting in the habit of developing theories that can be articulated clearly and then checked out in a thoughtful way. Of course, people who come up with good theories are people who are knowledgeable. You can't have a theory about baseball if you don't know the game. Good theorists are close observers who are always in the process of wondering why, putting things together and taking them apart! The things they put together and take apart differ: some of us theorize more about people, others more about cars. Some about history, others about numbers.
>
> But one thing all good learners need theories about is their own way of learning. Schooling ends early in our life, but learning goes on and on and on. So being a theorist about oneself *as a learner* is critical (1995, p.155).

Recognizing that the collaborative engagement they seek for their learners parallels the collaborative engagement they seek for themselves with colleagues is one way in which teachers begin to think of themselves as learners (see for example, Featherstone et al., 1993). This transformation in their professional identity as teachers can be threatening

and fearful; it can also be liberating and empowering. The process of professional development is tightly bound up with one's personal development. Of all the identities we have tried to place on teachers: teacher as technician, as manager, as caretaker, as facilitator, the ones that may matter most to the fundamental changes we seek will be crafted *by* teachers themselves, individually and personally. Like learning about the culture of teaching and learning about teachers' conversations, the transformation of a teacher's identity so as to reflect an orientation toward reform, also requires the support offered by transitive support communities of trusting relations and boundary conversations (Bruffee, 1993).

Lisa saw the mismatch between her teacher preparation program and her early experience in the field as *her* professional development problem; it was her responsibility to frame the work, to muster the resources, and to take an active stance toward "avoiding the rut." The rut represents the kind of teacher identity she wants to avoid.

It is Lisa's effort to avoid the rut that places her professional development in tension. Were she to not struggle to develop against the grain, were she to socialize instead into the existing culture of teaching, becoming more like the teachers for which she has so many models, were she to acquire the ways of being a teacher that continue to define the community she seeks to belong to, there would be no tension. But, because she seeks to develop as a reform-oriented teacher and because this goal is at odds with the norms of interaction among most teachers, the rut she fears is visible to her. Moreover, it pushes her to work actively to avoid it.

In this chapter, we return to Lisa's mathematics classroom, now in the spring of 1993. Across a series of experiences, Lisa drew on her membership in the IMT group for support in exploring what she thought she understood and to help her pursue an inquiry situated in the particulars of her classroom, her students, and their curriculum, that year. The strength and the influence of Lisa's boundary conversations with the IMT members is visible in her efforts to identify, pursue, and tailor resources that would help her investigate a problem of practice that she was theorizing about in direct relation to the sixth graders in her classroom. This problem of practice was also linked to her own experience as a learner. Through this investigation, Lisa tested the progress of her transition into a professional culture of inquiry and her skills for engaging in the intellectual work of her practice. She opened her questions and her private theorizing to others who supported her own learning. She contributed actively to the collective work of her boundary group. Lisa's theorizing about herself as a "teacher intellectual" is key in this story. Through a web of events and Lisa's reflections on them, Lisa demonstrated to herself that she is becoming the thoughtful, reflective, analytical practitioner she had envisioned. Through her sensemaking of this self-directed inquiry, she resolved—at least for the time being—her longstanding "fear of the rut." She convinced herself that she does have the commitment and the capacity to continuing to grow and change as a teacher learner.

The Grouping Experiment

Inventory! Thumbs up; Thumbs down. Look around and see who needs encouragement today. At this time, I would like you to clear away your music folder and your spelling sheet. I would like you to take out one more clean sheet of paper.

On May 4, 1993, I watched as clusters of children's heads bobbed in and out of their desks. All the while they were locating their supplies, they were also maintaining early morning conversations with their classmates. For all the noise and commotion, there was an atmosphere of a calmness, familiarity, and cohesion in the classroom.

Please raise your hand and look at me so I know you're ready. We have some special team time today.

There was a brief interruption from a neighboring teacher and then Lisa walked to the front of the room and continued:

Thank you. Please put your hands down. Yesterday, we took an interesting survey about how people act during small group discussion and how people act during whole group discussion. And what seemed to be most interesting is how people FEEL the other people act. How do you think other people treat you when you're sharing an idea? Do you think other people listen? Do you think people in your small group listen?"

Lisa's manner and her words became slow and deliberate as she moved forward toward the student's tables to share her thinking and her proposal.

And I was really surprised by the ideas that a lot of people felt that your small groups didn't seem to listen as well as the large group. I was thinking about that and I was wondering if we might use videotape of our own math classes to investigate that--to investigate the idea of how we work together.

Now, it is an interesting and very unusual thing to be able to look at something that you did a few months ago in your math class. I've talked before about how I used the videotape with other teachers? --to look at how a lesson had gone? Another way you could use a videotape--we've talked about how sports players could use videotape to see how a game went, to see how that swing is or how that pitch is so they can improve their own playing and that's kind of how I used it.

There was a very long pause. The students didn't react to each other. They seemed to listen to her in a serious way. Lisa became quite animated and began to move in and among the front three tables as she talked to the group. Her voice became louder and she began to speak rapidly:

Another way would be like the referees use it to say, 'well, we thought he was safe, but was he really safe?' Or, 'we thought it was a foul ball, but was it really a foul ball?' They can use videos to replay and you see that on sports all the time, now that we have the videos to do that. Well, I was thinking that your small groups went very well, but now I'm wondering, Hummm, maybe we should look at that again to see is that really happening or is something different happening. And so the video gives us a nice place to replay what happened.

Lisa spent a long time preparing the kids to watch the videotape. She continued to refer to her own experience in sharing tape, describing for them how she was nervous to show her tape to the teachers' group. The students watched her even more intently as she talked about worrying that the only thing someone would see when they watched the tape was students misbehaving and they would think she was a bad teacher. She asks the class to predict what did happen when she shared tape in her teachers' group. Students responded:

Susan: They listened.

Belinda: The opposite of what you expected to happen.

Sam: They gave you good advice.

Lisa agreed: Right. Because I know these teachers and I really trust them, I really didn't think they would rip me apart. I know that they support me and they like me and I know they wouldn't want to hurt my feelings but, still, there was that feeling of what if--that nervousness. Beth was right. They were supportive. They saw the same piece we are going to see today. Now what do you think are some things we need to remember...?

I stood ready to video-record the students as they watch themselves on videotape during a math class in the first week of December. The work that we were doing in the classroom on this day represented for both Lisa and me an exploration that takes seriously the idea of revisiting one's experience, drawing on multiple representations of that experience, soliciting other perspectives and talking about your sense making with the goal of clarifying, deepening or changing your understanding. The events which led up to this morning's viewing session with the children are a complex web of experiences, some in the distant past, some in recent months, that together prompted Lisa to examine her experiences as a learner and her beliefs as a teacher. Her inquiry centered on the merits of small groupwork in her sixth grade classroom.

Raising Questions about Practice

During a Thursday night IMT meeting in late March, 1993, Carole had commented on the difficult challenge of really understanding how her students were experiencing the activities and the discourse in her mathematics class. She had asked the group, "What do they make of all of this discussion? Does it seem helpful? What about it is helpful?" Carole's concern was one that had come up in the group's conversations before when the teachers worried together about the "resource room students" or those members of the class who aren't "auditory learners." The teachers had asked, "How do we know if what we are doing is helpful? How do we know if what we do is safe and productive for all of our students?"

These concerns were familiar to Lisa in her own practice. Indeed, her inquiry into one little girl's experience in the classroom earlier in the year had been guided by a similar set of questions. Still, Carole's comments during this meeting stood out to Lisa and a couple of months later she came to remember them as the starting point of a new inquiry in her own practice. Lisa's journal entry about this March meeting reflected how she was connecting Carole's ideas to her own questions. While Carole's thoughts didn't seem to fit her situation, they provoked Lisa's thinking and sustained her attention to the problem. She wrote:

> *It was reassuring and seemed a bit coincidental that Carole had recently been using a chart to record participation. I had been frustrated with the same dilemma. Even though I'm afraid that the chart as she uses it might be too stifling, I'm wondering if a more deliberate, obvious attempt is necessary to expand the number of students participating. I also think it is*

the feeling of pressure to get through the year, I'm getting less time to sort things out (Lisa's journal, March, 1992).

Origins of the Grouping Experiment

I first learned of Lisa's inquiry into her students' experience in small groups at another IMT meeting, the second following the group's return from the annual meeting of the American Educational Research Association (AERA) in Atlanta, Georgia. It was late April and on this particular evening some of the teachers met earlier to watch videotape with Sheryl and a colleague from Sheryl's school. Because her commute to campus kept her from arriving early, Lisa was not a part of this pre-meeting viewing session and so when she did arrive, she joined Helen and Steve and me in another room. She excitedly launched into a story of an experiment she was conducting in her classroom:

> *I've been trying an experiment with homogeneous grouping. ...A couple times ago we [the IMT group] were talking about how the same kids are talking all the time. I was wondering if it might help to have two groups divided so that kids who didn't talk very much in class discussion were together and so first day back from the conference--well, I talked about it with Helen and I talked about it with other teachers, who said, 'Yeah, I wonder about that.' Helen told me a story about one of her daughter's professors who did something like this.*

Lisa's experiment, I learned later, had roots in a conversation she had had with Helen on a walk through Atlanta's Underground during the AERA conference. It started out as a light conversation about kids' perceptions of the things their teachers do. For example: to many students, cooperative grouping often means, "Oh no, I'm going to have

to do all the work." This led Lisa and Helen into a discussion about "things I believe professionally, but yet have other reasons to doubt them." Helen described for Lisa how her daughters' personal experiences with groupwork in their college courses had raised hard questions about her own beliefs in the merits of groupwork. She told Lisa a story about a professor who asked the students to sort themselves into groups according to the criterion that they saw themselves as people who talk or people who don't talk in groups.

When I learned that this story was somehow connected to Lisa's attention to groups in her sixth grade classroom, I asked Helen about the story and she recounted it for me:

> ...And so they did [divide themselves into groups]. They were supposed to talk about whatever they had written for that day. My daughter said it was great, it was a really interesting discussion with the people in the group who had things to say and she wasn't the only one talking. They were all the people who had talked in class, who had said interesting things, that she never got to be in groups with. So, great thing number one was that people who talked were interesting and great thing number two was that when they all came back together again, all the groups had interesting stuff to say, including the "we don't talk" groups....
>
> (Interview with Helen Featherstone, April, 1993)

Helen's story had prompted Lisa to act on questions about groupwork that had been bubbling just below the surface of her thinking for some time. In a sense, Helen stood as a representative of the group, giving Lisa supportive permission to question her practice. Back to Lisa's telling about her experiment with her sixth graders:

Lisa said:

So, first day back from Atlanta, I wrote on the board:

[First part of the year]:
Hypothesis: *Students learn better in heterogeneous groups*
Experiment: *Heterogeneous group each marking period*
Conclusion: *+ special qualities, help each other*
- good speakers do all the speaking

[The Grouping Experiment]:
Hypothesis: *Students learn better in homogeneous groups*
Experiment: *Put ourselves into new groups*
Conclusion *?*

Lisa continued:

I thought I'd tie it into Science. I said [to the class], 'This year I have been working on the hypothesis that students learn better in heterogeneous groups and that means that they are at different levels and they each have different qualities that they contribute to the group. So, the experiment that I've been doing is grouping you heterogeneously each marking period and then my data, things I've noticed are, on the positive (+), you help each other in different classes and each group has special qualities and so, you work pretty well together. The drawback (-) is that it seems like if every group has a good speaker, those people are always the ones doing the speaking. I know that when I was in school, I know that there were times where I would be in a group and I was a very good thinker, but I was a slower thinker and I would need time to think through my ideas and so, other people who were quicker thinkers would say, 'Here's how to do it; do you get?' and I would never be able to figure out things on my own and that was frustrating for me. And so I want you to think about: Are you someone who gets a chance to talk in your groups and in whole group discussion? Or, are you someone who needs more time to think?'

After lunch, I had them go into their two sides and there were several kids in the middle who said that they were in the middle either because they couldn't decide, it depended on what they were doing, or there were a few

who said they were in the middle because they didn't want to talk. These are not shy kids; they don't want to participate. There are about five in the middle. I told them this was an experiment and we would all collect data.

I had a group of boys who were strong speakers; a group of girls who were strong speakers; another two groups of girls who were quieter. It was amazing that with most of the groups, even though they were homogeneous according to how they talk, they really were heterogeneous according to math ability. There were two groups of girls that were quieter, but they both had two really strong math students in them. Then there was a group of boys that considered themselves to be quieter, but three, really all four of them I thought were strong.

Lisa continued with her lengthy description of the way the children divided themselves into groups. We had to interrupt her story when it was time to join the rest of the IMT group to begin our regular meeting. While this web of events continued to spin, I was watching and wondering from the periphery. What was Lisa's sense of all this? I was eager to talk with her. I was curious about her reaction to the little girl who told her, 'I really like this because I get a chance to talk. In my old groups, they'd say this is how you do it; do you agree?' Lisa said she knew exactly what she was talking about. I wondered how this fit with Lisa's experience in groups?

Over the next few weeks, I collected stories from Lisa and Helen that helped me to see multiple connections (see Figure 8.) between her conversations, past experiences, reflections and current decisions.

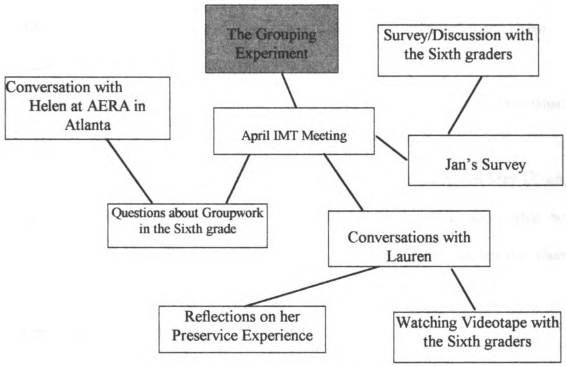

Figure 8. Events highlighted in Lisa's inquiry into groupwork.

In the late April IMT meeting, when Lisa shared with us her story of the first 10 days of the experiment, she acquired another tool for her inquiry. When the whole IMT group convened for their regular meeting, Jan described a survey she had just given to her third graders that week. She had asked them to respond to the following questions:

1) I usually, sometimes, or never feel that others are interested and care about what I have to say in class;

2) I usually, sometimes, or never feel that my teacher is interested and cares about what I have to say in class;

Lisa picked this up and said she wanted to borrow the idea. She thought it fit with the discussion she was having with her students. The group discussed it and Helen suggested she might add a third question:

3) I, myself, am usually, sometimes, or never interested and care about what's being discussed.

It is this survey that Lisa was discussing with the sixth graders on May 4th, when she shared with them her concern over the responses and her curiosity about what they might learn about their groupwork by watching a videotape of their mathematics class.

The Connections Continue

The issue of the students not liking the small group discussions became the focus of my next telephone conversation with Lisa. I asked her to tell me more about her surprise at the students' perspective; I said I thought she sounded troubled. She said she *was* troubled; the students' responses had caught her off guard. I asked if she shared her surprise with the students. She told them it seemed odd to her, it surprised her, and she wondered why they felt that way. As a class, they had a further discussion about people not listening to each other, people not really hearing what each other has to say, or not paying attention. As she talked with me, I was struck by how our conversation now, in April, contrasted with my images and memories of the class when I was at the school in November. Then, they had said things like, "Mrs. Pasek's class is different because we talk and we share ideas and we listen to each other and that's what this math class is

about." Now it seemed they were saying that "we don't listen to each other and we aren't sharing." I told Lisa about my recollections and she added that despite what looks to be this warm and fuzzy cooperative conversation, "there are people that don't feel like they are being heard at all and it's not a good thing!"

I told Lisa of my curiosity about what might happen if we showed the students a videotape of their small group discussions, one we had from last fall. This made sense to her and together we realized that this was the next focus of our work with videotape; this was what we should videotape, view, and discuss. Over the telephone, then, we planned how to document her students' reflections on their discourse so she could study them and perhaps share them with colleagues.

Students and Teachers as Researchers and Colleagues in Learning to Learn

On May 4th, I arrived at the school just before 9:00 am. Lisa had already reviewed quite a bit of the videotape. She said she wanted to show the kids the same clip that she had shown to the IMT group. At 9:30 the students arrived. Lisa set them up to take notes on what they saw and to try to capture as much of their thinking as they could about what they were noticing. She talked about finding patterns, watching for patterns and what's happening in the class that strikes them, what they would want to say about it. I added to her introduction that they might also note any questions that they would want to ask. So, we watched the 15-minute segment of tape without stopping and then Lisa began a discussion about what they saw.

Lisa had crafted four questions while the students were watching the videotape. First, before they began to talk, she gave the students an opportunity to write whatever they were thinking about; an open-ended, 'What did you see?' Second, she asked them to write about anything that had surprised them, anything that they had seen on the tape that they didn't remember happening. The third question was, 'How is this class that we just observed similar to other math classes; how is this like their math class usually? What things about it are the same?' And then, fourth, the flipside of that question, 'What was different about this math class from their math classes usually?' The class wrote for about 10 minutes.

Susan spoke first and two or three students followed her lead to explain that they didn't think people were camera shy, they didn't see a lot of kids making faces or turning away from the camera as Lisa had suggested they might see; 'that probably wasn't as big a deal as we might have thought it was.' They noted and described some "first viewing" surface features. Then, their discussion shifted.

With Susan's lead, the group began to talk about what was happening in the small groups. They described how it didn't seem that people were really listened to in the small groups. In the video segment that they watched, Mike and Susan had worked together quite intensely and then turned and explained what they had been working on to Doug. Doug had had a hard time engaging with the group, looking away or making comments and asking questions that were not connected to the group's discussion. Frequently he nodded his head, as a sign of understanding, but his gestures didn't fit with his comments.

In viewing the video segment Susan and Mike were not convinced he had connected with them or the ideas.

Lisa and I had talked about Doug's participation before the day began. During the survey on Monday, he did what Lisa called "middle of the road responding" by saying that he sometimes, or usually, does feel listened to and feels like he's interested in others. Lisa had said he played it safe and she expected that this videotape was going to show him something quite different. She had wondered ahead how he might react to the images. Now, the students had picked up on what was going on. Bill made a sophisticated and articulate observation about Doug's interaction with Susan and Mike. He asked, "He says he gets it, but how do we know he understands?"

Lisa's Reflections On Learning From Her Practice: The "Rut" Is No Longer A Threat

At the end of this school day, Lisa wrote a journal entry in which she listed several of the recent experiences in her ongoing inquiry. She worked with several students' reflections of the grouping experiment to formulate questions she could take to the IMT group for further discussion. Perhaps most important to this close look at a teacher's sense of self and knowledge of self as a learner are Lisa's reflections on her discoveries about herself:

> *So many things have been coming together since returning from AERA:*
> * *"presenting" to the staff, using choral reading from the IMT 's Georgia tour*

** The beginnings of The Grouping Experiment in my own class:*
- Procedure
- Experiment
- Observations (Data)
- Revision as a result of some very impressive class discussion
** Jan's questions to her class, Helen's suggestions for a further "angle"*
**Linking these questions to some foundational wonderings about the true advantages and disadvantages of heterogeneous groupings-what service are we really doing for these kids if we put them by someone who will just give them the answer?*
--The importance of social skills in Cooperative Learning (esp. checking for understanding and equal participation)
--But how much do we really practice these social skills, even as adults!! (Paley) How can we depend on these sorts of interactions as basis for our classroom learning routines...?!
Before I get too deep into today's video discussion with the students, there are two things I have discovered about myself:

#1--I am much less worried about getting into a rut during my career because even as much as I think something through and feel strongly about it, I still see myself as being open to thinking through other perspectives. The heterogeneous/homogeneous dilemma was never an issue for me before. In general, I still believe that heterogeneous groups can provide support and extension for all students involved, but in a "socially constructing" learning community, kids also need to be discovering for themselves at their own pace. I believe I'm very open to dusting off my own mirror and looking more carefully and more deeply at what I am doing. One of my parent helpers was marveling at our grouping experiment and told me how courageous I was! I think it is just a matter of perspective. If scientists who keep trying to find the best way to fight a virus or cure a disease are courageous, or if the figure skaters who continuously strive to make the newest, most challenging maneuver look easy are courageous, I guess I am courageous, too. Risk taking requires courage and trust. Trust in yourself that you have solid reason for your actions, trust in yourself that whatever happens, you'll figure it out--or at least try to. Trust in those around you...that they'll help and support you in whatever way they can...which leads me to notion #2.

#2--I often ask myself, perhaps as a questioning of character, would I continue to do all this "stuff" if there were no IMT , no MSU affiliation, no researchers, no official audience for my inquiry and investigations? I

might try to tell myself "Oh sure! I'd do it for the pure exhilaration of reveling in kids' and in my own insights! However, even after an outstanding morning of kids' thoughtfulness and insights ***bowling*** *me over, an afternoon of chatty kids, a staff meeting, and a common cold are enough to make me reconsider...****And*** *if there were no audience with which to share and collaborate, all my work, alone in a vacuum, would seem unimportant and not nearly worth the effort!*

And I suppose this is why when my husband asks, "Is this IMT group going to last forever?" my first impulse is, "I hope so!" In some way, shape, or form, teachers need teachers in dialogue that is more sustained than "And guess what Johnny did TODAY?!"

Predictions: And to think I was afraid of overestimating what the kids would notice about the videotape. Such an interesting play-out of first, everyone seeming to agree that the small group worked well, like a group is "supposed to", by "helping" and giving the answers-- and then, the pivotal issue from Bill and Jamie:

Jamie: "The person still didn't understand, I don't think."
Bill: "How do you know when someone knows....?"

WOW! The kids should just take over writing up the agenda for our IMT group and any other educational societies--the students zeroed in on BIG ISSUES--not because they're obviously big issues. In fact, they seem subtle, but so crucial.

"We can learn that the kids need time to work so everyone gets the problem and the answer. We have to have time to explain our ideas. "
--Tammy, sixth grader

"Maybe if we have a person go up and explain their ideas right at the beginning of math discussion, then we can have a small group talk and we can explain that one person's idea."
--Susan, sixth grader

This idea that whole group is somehow more productive than small group? Or is it safer? Less intense than one-on-one work? A more powerful combination of ideas? More trust in what the whole group discusses and agrees upon? A good question for the IMT group: Are these small "safe" small groups serving their purpose? How do we know? Small groups contain fewer people, perhaps one or two people, explaining

and re-explaining their one or two ways of tackling the problem while large group has many more "teachers" involved--struggling students can pull away from intense scrutiny, "DO YOU GET IT?! But, there's always the dilemma of the struggling student.

"Learning--I think we can learn that watching a second time, you really notice things that you didn't before. Like someone doesn't understand so someone else helps to try to help that person understand....Wow, this is neat. There are lots of wonderful ideas about helping and giving advice. I am now understanding what really happened."

--Emma, sixth grader

This comment of Emma's may have something to do with why I chose to have the kids view the same tape segment as I shared with the IMT ...getting another view of "what really happened."

"We can learn that kids understand each other better than adults. Most kids think the same way. Teachers were taught different. It was a good discussion."

--Wanda, sixth grader

"Susan is asking Doug "Do you agree why .515 is bigger? That is good checking for understanding."

--Sam, sixth grader

Wanda's comment gives me some insight into why kids can so often understand and pick out each other's misconceptions so easily. She's right. They do have a more common background together than teachers have with them--especially as curriculum changes and teachers who are struggling with change have even less of an idea of what new fangled methods students may have been exposed to in an earlier year. They have less of an ideas of what they can "connect to"--

Sam's comment highlights the debate in class between the advantage of how a group works together versus the disadvantage of kids not really understanding, even though others try to "tell them." This tendency for "This is how you do it--Do you get it? Do you agree? And what a skewed way to use the language of "agreeing" with an idea.....

(Lisa's journal, 5-4-93)

A Conversation about Learning from Experience

A week later Lisa and I met in her classroom after school. Trying to piece together this web of events and to explore their educative potential for us, I guided Lisa through a series of retellings. I had a hunch that there were interesting connections between/among several parts of the stories and events that had occurred in recent weeks: Lisa's conversation with Helen in Atlanta; Lisa's revisiting her experience in Glenda's class; Lisa trying the homogeneous grouping experiment with her class; an IMT meeting and Jan's questions; the students watching a videotape of their mathematics discussions. I wanted to get all of this on the table where we might work with it together; I was curious about the ties between her past experiences, recent interactions, and what she was doing with her students. I had a hunch that she was drawing on several sources of thinking, of experience, of support, of intersecting learning communities, to make sense of what she knows and believes, about groupwork in her classroom. I asked her to retell these pieces, some that I had only heard in part; some that I had heard second hand; and others I just wanted to hear again, all in the same conversational workspace (Denyer and Pfeiffer, 1996).

As she retold these stories, Lisa drew on her journal, her notes from teaching, and her conversations with others. She talked at length; I didn't want to adhere too closely to a structured set of interview questions. I wanted to see how she might pull together the telling of these stories--what she connected. The following is an excerpt from our three-hour conversation on May 7, 1993. Here, Lisa describes connections between her current

investigation into groupwork with her sixth graders to her experience as a group member in her teacher education classes:

Lisa: In each of the three [math] classes, I did those questions and I had told you how struck I was when my class said, 'Well, are you asking about whole group or small group?' I said, 'Well, whole group; that's what I'm most worried about. Do you think it would be different?' They said, 'Oh yeah, it'd be different!'

I thought, well, OK. And I told you [Lauren] that I thought for sure, small groups are safer. So, they are going to feel more listened to; there are only three people there; people are going to listen to me (student) in small group. People might not listen to me in whole group. I was just devastated that it was the opposite; people felt less listened to in their small group or that there were people--more often--there were people that felt never listened to in their small groups.

...Helen's suggestion for the third question, *I myself am usually, sometimes, or never, interested and care about what's being discussed*, is what really hooked me into doing this survey with my students. I hadn't linked the survey to the grouping experiment; the kids saw it that way.

...I hadn't linked this survey to my teacher preparation experience until some of the groups talked about why they didn't talk. *That* made me think about my own experience when I was in my own preservice math education class. I was in a group of four students. We worked in cooperative groups. And really, once we were set; it wasn't assigned seating, but we just sat in the same place. There were 25 of us and for 2 years we had the same group pretty much.

Lauren: The same foursome?

Lisa: Pretty much. Maybe you'd switch around a little bit but you know, we were responsible students and we were supposed to take care of our grouping. In my group was myself; there was Amy who was an older student and she was very unconfident in math; there was Lucy and she was my roommate. She was real

sharp in math; and then there was Jerry who was sharp in math but whatever he lacked in understanding, he made up--with his mouth. If he got a problem that he didn't quite understand, instead of looking at it quietly, he'd--I'd look at a problem and kind of think, quietly; He would look at it and say, 'OK, what do we know, here. OK, we know that 1/2 = 1/2. OK, right now, we know that 1/2 is not equal to da da da da te da. And he would just talk! Non-stop. And what ever you were thinking, he just grabbed it right away with his mouth. He was very enthusiastic and I liked him as a person but it made it hard for me to learn math for myself. So, there is Jerry and Lucy and Amy and myself.

Lauren: And what is the parallel description of you? This person was really sharp in math and this person was really sharp in math and made up for what he didn't know with his mouth, and this person was sharp in math but unconfident.

Lisa: I would say, I was--I was unconfident in math and--I don't know; I could have figured the things out, but I never had the time. I was never given the time because of the group. And I didn't really notice that when I was in the class. I just--they'd say work in a group and we'd always get it. Once it was explained to me I did understand it but there are things, still, like when someone says, 'remember this problem from our class', I'm like, "No." Or, 'remember the line through the forest problem'? I remember I never got that one! I remember people trying to explain it to me and I never did get that one.... Our experiences were so different. Most of the time, I remember the problems and I can tell you what I learned but there are some, like the line through the forest that I never did quite get it. And I remember the frustration of being in that group. I guess at the time I didn't realize I was frustrated because that was *how it had been*.

So, all those things were building up and remembering what that group was like, helped me really pinpoint--I thought about that—my own group—and I thought, that was a heterogeneous group! Lucy was the highest; I was the medium or Jerry and I were the mediums and maybe Amy was the low because she lacked a lot of concepts, too. Or at least she seemed like she did because she had so little confidence. I was not confident

but I was willing to try but she was not confident and berated herself a lot.

Lauren: And just pulled out.

Lisa: Yes. She'd get real flustered and say, 'Oh, I can't do it; explain it again.

Lauren: It makes me think of Rosey [in your class].

Lisa: Yes. And it struck me that that was a heterogeneous group right there.... And I was, technically, a good student and I still suffered from--I guess--from what I could have maybe done if I would have had the chance to discover it on my own.

Lauren: Describe for me what it was like.

Lisa: It was--it is a lot of things I see played out here in my classroom. Someone kind of getting stuck and then a pair works on it and it's, 'Oh yea, maybe that's it' and then when they get in their small whole group it's, 'yeah, yeah, that's what it is.' Or, or, two are sure and the other two aren't sure and they get together and say, 'yeah, that must be what it is.'

It's not necessarily negative either. You know, I usually sat across from Lucy and next to Jerry. That image is so strong of the four of us! I learned a lot in that class but it is just--the affective results. There were a lot of wonderful affective results from that class but in the group, I remember that feeling--but, you know, there is another side of it. If I hadn't been with people who were a little bit stronger than me, would I have gotten it all--as much as I got? I had a lot of questions.

Lauren: When?

Lisa: Thinking back on it, after Atlanta I had a lot of questions about that group. How did it help? How did it hurt? Would I have learned as much if I hadn't been in a strong group of people? Or, would I have learned more if I had a chance to puzzle it out myself? What do I remember; what do I not remember because of that group?

Lauren: Mathematically?

Lisa: Mathematically. So, I was--that was kind of happening all at once; all this thinking about it. By the time I got back from Atlanta, I knew I wanted to try the experiment with my class on the following Monday.

Lauren: Was this the first time you questioned your experience in your teacher preparation group?

Lisa: Pedagogically. This is the first time I ever questioned the theory behind the grouping.

Lauren: Is it the first time you ever thought hard about what happened to you as a learner in your preservice class?

Lisa: No. As a result of all of the things I'd thought about as part of the research project, I had done a lot of reflecting about how I, myself, changed as a learner and about how my ideas about math changed; ideas about myself as a mathematician. But, I'd never before thought about my, um, maybe my learning style?

Social constructivist theories of learning describe the power of having learners value and own their sense of understanding rather than relying on external authorities--their teachers and their books--to tell them what they know and don't know. Memories of her preservice education included experiences in which Lisa was encouraged and supported explicitly in knowing herself as a valued thinker in a community of thinkers. She told me a story about a conversation she had with one of her professors during her junior year in college. This particular conversation was pivotal in Lisa coming to know herself as a valued thinker:

Lisa: He asked me if he could talk to me in his office; he wanted to 'talk to me about the way I think.' I was dying!

Lauren: Why?

Lisa: Well, I was afraid. I didn't know what he meant. So after class I went up and I said, 'What do you mean, how I think?' And he said, 'Well, I've been watching you. A lot of students have their hand up and nothing to say. You don't always have your hand up but you have a lot to say and I want to talk to you about how you think.' He said he thought I was a very careful thinker and that I was analyzing things but not necessarily getting into the conversation as quick as other people. I definitely agreed with him because I was aware that Lucy and Jerry were—always—raising their hands and there were a lot of people that were argumentative. There were a lot of people who had real strong personalities.

So, I thought this professor had a good point. He told me he thought I could really pull some things together as far as curriculum development, pull together some innovational kind of things. He said that's were curriculum is going, toward integrating things. He said, 'It just seems to me that you could really do some good work in that area.'

Lauren: How did that strike you?

Lisa: I was just thrilled! I guess that helped give me confidence as far as--and that's a big part of it too, valuing deep thinking, even if your not a quick thinker, valuing thoughtful thinking. I guess that's where I really got that message, good and strong.

Lisa's experience as a preservice teacher, including this explicit naming of her as a thinker by a respected teacher, contributed in compelling ways to Lisa's embarking on a path of identity development that includes a self image as a valued thinker. In contrast to her schooling experience where she received messages that "quick thinkers" were more valued, a descriptor she would not apply to herself, she was helped in recognizing that as a careful, analytical thinker she had a great deal to offer her learning community. It seems

important to consider this pivotal event in Lisa's experience in the larger context of her preservice experience where she was being introduced to new ideas and perspectives on children's learning in classrooms. Lisa realized she would need to be an active analytical thinker herself in order to support her students' development as thinkers and valued members of a learning community. She was able to connect how others know her with her own lived experience and then use it as a resource in thinking about her aims for students:

Lisa: WHhoooaa! That's weird. I knew that was part of it but, and I knew that it was very influential; I guess I just hadn't thought of it being directly tied to the grouping experiment.

Lauren: Where are you now in thinking about groupwork?

Lisa: I am reaffirmed in the ideas that the progression from individual to team--individual, partner, team; get some different ideas generated; go to the whole group; compare ideas; get as many different strategies as you can so people have multiple ways of understanding the same problem. I've tried to work in more closure; closure even if it is not necessarily the closing of a problem but, capturing on paper what your ideas are at the end of class. I usually have done that, but I've started being more deliberate about it; leaving more time and not just saying, 'O. K., jot a few things down.' I am more deliberate in leaving a cushion of time where everybody has to be writing and then putting the paper carefully into their notebooks so they have it for the next day.

...The idea of going back into small groups after having a whole group discussion; that seems to have some merit.

Lauren: And that's new since all of this exploration?

Lisa: Uh huh. I mean, it's not that it never happened, but it seems to have more of a purpose, to reflect and to bring closure. Explain to a partner; explain to your team; make sure you have a chance to explain what you think happened in the large group discussion.

Learning About Self As Learner And Self As Teacher

Lisa's grouping experiment and her use of videotape with her students supported her image of self as a collaborative learner, in this instance, in company with her sixth graders. She had the personal-professional resources (self, me, IMT) and her ongoing history of participation in the reform work to guard against her fear of not "pulling off" this inquiry. Part of what Lisa learned, indeed what she marks as key, is not that she "pulled off" the inquiry and learned something profound about heterogeneous groups but rather that she learned she is and will continue to become a thoughtful, learning teacher:

> I had written some about the grouping experiment but as far as trying to pull it altogether into some kind of document, I have never done that. One of the things I was worried about was that if I talked to people, saying that I did this grouping experiment and they would asked me what it was about and what did you learn about heterogeneous groups? If I had written about it back then, I probably would have tried to come to some conclusions about heterogeneous groups, but having had some distance, I have an idea that the grouping experiment was not--that what it taught me of value is not so much about heterogeneous groups, because I still don't know what I think about heterogeneous groups. But, what it taught me is that I have more confidence in myself that I am not just going to fall into a rut and be stuck there forever. If I was willing to question, in a very serious way, and involve myself and my students and a lot of people in a very serious inquiry, into something that I really believe in; if I was willing to seriously question and to dig into something that I believed in then, that must mean that I am open and changing. I guess, when we wondered what we would find out from a year of working with videotape, we have pulled together some interesting ideas about how to use videotape and some of the benefits and some things that can happen and some reasons why those good things might or might not happen, but the most important lesson for me is what I have learned about my own development as a teacher. (edited quote from a conversation/interview with Lisa, December, 1994)

As a result of my study of Lisa's learning from her experience, I think about the reflective practitioner in new ways. I have a new sense of the multiple dimensions of analytical sensemaking when a teacher examines her experience. For Lisa, a goal of her work is to continue becoming a teacher who raises questions about her practice and seeks collegial support and participation in her inquiries. In her original request for my help in videotaping her classroom Lisa was asking for help in supporting her development as a reform-oriented teacher. The notion of fitting images of the possible with what happens in the classroom underscores for me the rareness of imagery as a resource for teachers to gather and study representations of their experience for the purposes of continued learning to teach. Lisa's experience in learning about the powerful influence images of teaching can have on her thinking and on her work gives me a sense of the many missed opportunities for learning from experience resulting from teachers' isolation.

Believing that learning happens through social interaction with others, Lisa sought the company of colleagues with whom she could continue to learn about teaching. Worrying that she "may too quickly settle for her own perspective," she sought the different perspectives, different experiences, different ways of making sense of classroom life that other teachers can bring to conversations about teaching.

She first knew this work in her preservice teacher education program and her first year of teaching was a bridging experience that showed her the potential for situating her continual study of teaching in practice. This early experience also introduced her to the real challenges of enacting and articulating her vision of practice to parents and

colleagues. Lisa maintained her ties to the university, the source of her commitment to intellectual engagement about her work. With each course or study group she seemed to strengthen her sense of self as a thinker and deepen her commitment to the identity she would craft as a practicing teacher, grounded in inquiry and experimentation.

When Lisa joined the IMT group, in the fall of her second year of teaching, her efforts to grow intellectually were placed in tension with the culture of her school. To belong there, to establish and sustain collegial relationships with colleagues in her district, she felt pressed to adhere to deeply entrenched norms of sameness. She felt pressed to join her teaching colleagues in presenting themselves as alike in style, perspective, routine and belief so as not to be too different, or to threaten the predictable, manageable homogeneity of the faculty. It seemed that her ticket to successful socialization in her school faculty was to hide her own and ignore others' differences in competence, philosophy, and knowledge. Yet hiding this diversity would block the very resource—the community—that could contribute significantly to her aims to become a reform-oriented teacher. Hiding this diversity could limit her opportunities to raise questions about teaching, to consider alternative perspectives, to reflect on the multiple experiences of other teachers.

And so, the IMT group became a transitive support community in which Lisa might find both a sense of belonging and sense of becoming that would support her identity development and her learning of a reform-oriented practice of teaching.

CHAPTER SIX

Constructing Professional Participation Knowledge For A Teaching Practice

We are living and teaching in times when the struggle to affect changes in the professional development of teachers is more conscious and more visible than ever. In this study, I have explored some of what it takes for a teacher to support her own continued, self-directed professional development; what helps and what hinders her development as a practicing teacher in a period of intense educational reform; and how my own learning as a researcher can both contribute to and be served by a collaborating partnership.

The context of this study was my collaboration with Lisa Pasek, a sixth grade teacher in a mid-size, Midwestern school district. Lisa was interested in how the videotapes of her own teaching might inform her efforts to develop a discourse with children in which they explore multiple perspectives on solving particular mathematical problems and look to themselves and to their peers as sources of support for their own learning. She was also curious about how she might use videotapes of her teaching to talk with her faculty colleagues and administrators about her practice.

My goals for the study were two-fold. I wanted to pursue an inquiry rooted in the ongoing work of a classroom teacher. I also wanted to design a study that involved the kind of work I plan to continue doing as an educational researcher and as a teacher educator. Specifically, I knew I wanted to use the dissertation project as an opportunity

to learn about a kind of collaborative work that is called for in the literature yet, is neither easy or obvious how to begin and sustain. This question guided the research project: *What and how does a teacher learn from conversations around videotapes of her teaching?*

In looking back at the three contexts in which Lisa engaged in conversations around videotapes of her teaching: in a meeting discussion of a teachers' group, in a dialogue with me, and in a classroom discussion with her sixth grade students, I learned that Lisa's use of videotaped records of her teaching required that she construct and employ new kinds of knowledge about teaching and learning. The kinds of knowledge needed to support Lisa in critical examination and articulation of her understandings, her beliefs, and her practices are different from the knowledge of learners, subject matter, pedagogy, for example, that is identified as part of a knowledge base for teaching. Lisa's learning in this study reflects her development and use a domain of knowledge for a teaching practice that supports her capacities to work with colleagues on individual and collective inquiry into teaching and learning. In what follows I offer a description of this knowledge, setting this domain in relation to an existing domain of teachers' knowledge for teaching. I explore a framework in which these two domains taken together constitute a teachers' knowledge for practice and respond to the calls for reform in teachers' professional development. I draw on my analysis of Lisa's use of videotapes of her teaching to identify a preliminary set of categories within this domain of knowledge that may be distinct and significant to her ongoing professional development. Finally, I explore what this study might offer researchers, teacher educators, and teachers about

what practitioners may need to know to share their wisdom of practice and to transform it into tools and resources that support their continual learning and development as reform-oriented teachers.

Learning In A Different Domain Of Knowledge

At the time I proposed this study I expected that, through this work with Lisa, I would better understand how a teacher might learn about pedagogy, for example, by examining her actions in a lesson; or how a teacher might learn more subject matter by assessing the content students explored during a classroom activity; or how a teacher might learn about her learners by analyzing their interactions— all recorded on videotape and used in discussions with other teachers. At the close of this work, I believe that indeed Lisa may have increased her understanding in these areas and perhaps deepened her knowledge of pedagogy, subject matter, and learners through conversations about the video records she revisited. I believe, too, that our awareness was heighten about the collegial relations that surround her conversations about her own teaching. Her journal writing and our ongoing conversations clearly reflect the safety, trust, and care needed to engage in this work.

The teacher learning of significance, in response to my research question, however, is of *a different domain.* Lisa's participation in conversations around videotapes of her teaching—and her preparation for and reflection on these conversations—supported a kind of learning that differs in its form and in its function from the kinds of learning

supported during her preservice education program and her early inservice work. While Lisa may have been working on her knowledge of pedagogy for elementary mathematics teaching she was also using and deepening her knowledge of participation with colleagues around representations of her teaching, questions, and ideas about that pedagogy. In her pursuit of collegial conversations that would affirm, push, and develop her thinking about pedagogy, Lisa became critically thoughtful about *what kinds* of collegial interactions she was seeking. She also created and nurtured opportunities to become skilled at *how to create* these interactions.

Another way to described the domain of learning highlighted in this study is to return to the notion of a secondary discourse for teaching. In order to engage the IMT teachers in a conversation around her videotape, Lisa drew on the knowledge and skill she acquired in her apprenticeship of observation and her early socialization into teaching, her primary discourse for teaching (Denyer and Florio-Ruane, 1995). Additionally, for the same purpose, she drew on her introduction to a secondary discourse for teaching she was acquiring through, in part, her membership in the Investigating Mathematics Teaching group. Her activities in this study reflect an active engagement in the kind of transitional work Bruffee (1993) describes as necessary for meaningful enculturation, supported by boundary conversations in a transitional support community.

What stands out from the study reported here as a response to my question, *What and how does a teacher learn from conversations around videotapes of her teaching?*, is that conversations around one's own videotape of teaching can create opportunities to

construct and use meaningful, educative forms of participation in a professional discourse. In the context of a transitive support community, a teacher can construct knowledge needed—both understanding and skills—to engage in a kind of continual learning situated in a reform-oriented practice. The evidence presented in this study suggests that Lisa's knowledge of situated learning to teach with colleagues is of a different domain than her knowledge of curriculum or pedagogy. That is, Lisa's knowledge of curriculum has at its center student learning, instructional design and student achievement; her knowledge of pedagogy has at its center classroom contexts, the relation of content to activity, and community building. In contrast, Lisa's knowledge of the culture of teaching has at its center teachers, practice made public, and discourse strategies for support and inquiry, both in the service of student learning, and also as a valued focus of her own personal professional development.

Knowledge needed for meaningful participation in a reform-oriented discourse, a secondary discourse for teaching (Denyer and Florio-Ruane, 1995), is knowledge that enables teachers to move their practices to public forums where they can be shared and problematized for collective learning. This knowledge holds promise of enabling teachers to shift their conversations about teaching toward critical examination of understandings, beliefs, and actions. This knowledge holds promise of enabling teachers' personal growth to become intentional and more integral to their professional practices of teaching and learning.

To articulate further what I have learned from this work, I continue describing the

kind of knowledge Lisa was using, constructing, and refining in our work together, as *professional participation knowledge* for teaching in the context of reform. My aim is to articulate what I have learned in a way that suggests a framework for the complex knowledge base developing in and among teachers who are pursuing real and sustained changes in their teaching; that is, in and among reform-oriented teachers. This framing offers two ideas: First, the calls for reform in teaching require teachers' development and use of two broad domains of knowledge: knowledge for teaching and *professional participation knowledge.* Together, these knowledge domains are comprised of many varied and complex kinds of knowledge a reform-oriented teacher needs to create and sustain a practice that includes thoughtful work in and around classroom instruction (see Figure 9). Second, the relationship between these domains of knowledge is such that the extent to which a teacher can develop her knowledge for teaching in response to the reforms may be dependent on her development and use of professional participation knowledge for a teaching practice.

In their recent writing on the reform of teachers' professional development, Deborah Ball and David Cohen (in press) sketch an ambitious and intriguing approach to the reconstruction of teachers' professional education. They distinguish their proposal from those that call for the restructuring of roles, time, and relationships. Acknowledging that such restructuring may be needed, they argue that these alone will not lead to better instruction or learning.

Rather, they propose:

> ...new ways to understand and use practice as a site for professional learning, as well as ways to cultivate the sorts of inquiry into practice from which many teachers could learn...To affect what teachers might learn, one must consider the curriculum and pedagogy of professional development: *what* teachers would have opportunities to learn, and *how* they would be taught (Ball and Cohen, in press, p. 5).

I am eager to explore beyond this study how a conception of teachers' knowledge that includes professional participation knowledge, for inquiry into practice, for example, might contribute to the reconstruction of teachers' professional development.

To help distinguish professional participation knowledge from knowledge for teaching, I draw on the oft-cited work of Lee Shulman to begin to outline how Lisa's knowledge about collegial interactions, specifically, teachers' conversations, and about herself as a learner, functions in special relation to her knowledge for teaching. I speculate about Lisa's *knowledge for practice* then, as comprised of her knowledge for teaching surrounded, supported, and further developed, in part, because of her knowledge of professional participation with colleagues.

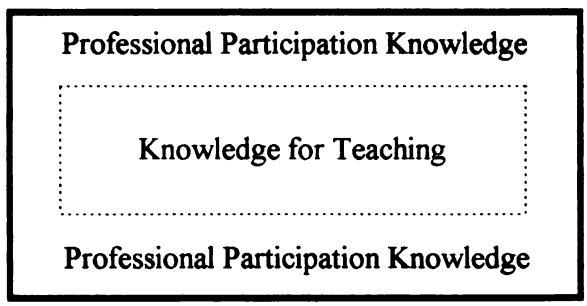

Figure 9. A Framework for Teachers' Knowledge for Practice.

Following my description of professional participation knowledge, I turn to the examples in this study to illuminate a preliminary set of categories in this domain of teachers' knowledge for practice.

Professional Participation Knowledge **For Teaching In The Context Of Reform**

In *Knowledge and Teaching: Foundations of the New Reform* (1987), Lee Shulman outlines a set of categories of knowledge that underlie teachers' understanding needed to promote comprehension among students. In the decade that has followed, numerous other researchers have also asked, What do teachers need to know and be able to do in order to teach in ways envisioned by reformers? (see for example, Wilson, Shulman, and Richert, 1988; Feiman-Nemser & Remillard, 1995; Lampert & Ball, 1998.) A debated issue in our field, researchers and teacher educators continue to pursue their understanding of the complex kinds of knowledge teachers use and develop for their work with students.

A common and emphatic response to this question stresses the importance of teachers' knowledge of the subject matter they teach. In addition to subject matter knowledge, Shulman offers six other categories of knowledge: pedagogical knowledge, curriculum knowledge, pedagogical content knowledge, knowledge of learners, knowledge of educational contexts, knowledge educational ends, purposes, and values (p.8). Offering further organization, Shulman describes four major sources for the

teaching knowledge base: 1) scholarship in content discipline, 2) materials and settings, 3) research on schooling, and 4) wisdom of practice itself.

Of particular interest to this study is the notion of teachers' wisdom of practice as a source of knowledge for teaching. In 1987, Shulman argued for a more systematic gathering, studying, and organizing of the individual and collective knowledge held by teachers. His focus was on the need for researchers to glean and codify what teachers already know but have "never tried to articulate" (p. 8). He reasoned that close work with teachers would bring forth and contribute to organizing teachers' wisdom of practice in ways that offer the field a deeper understanding of the principles, theories and beliefs that shape and direct teachers' practices. And I believe the last decade of work has demonstrated the benefit of close work with teachers and supported the emergence of not just cooperative partnerships in which teachers grant researchers access to their knowledge base, but also collaborative work in which teachers and researchers together generate new understandings in response to questions about teaching and learning. Building on the last decade of innovative research relationships with teachers, I think there may be another path to pursue for what we might understand about teachers' knowledge by working closely with them as they make explicit and use what they know in their work.

It seems there are two places to look inside *teachers' wisdom of practice*. One territory, as Shulman describes it, includes the theories, beliefs, and principles teachers hold about content, learners, contexts, and curriculum. Teachers develop wisdom about multiple aspects of their work and often use it in unarticulated ways. This wisdom

includes things they have learned to do *in situ* but have talk about in an explicit or analytic manner. When tapping teachers' wisdom of practice, we are asking them to make explicit, to talk about, to make visible their *knowledge for teaching*. This is a premise of much of the collaborative research of the last decade and it has provided critical contributions to the collective knowledge base of researchers and teacher educators.

How to tap into, to gather, and to organize what is gleaned from teachers has been a topic of methodological debate. Gaining access to what teachers know requires teachers' active participation and thoughtful engagement with other educators. This is a second territory inside a teachers' wisdom of practice. It is this participation—a teacher's capacity to participate—that has raised a related but different question through the course of this study: What do teachers need to know and be able to do to articulate their knowledge for teaching: to converse, examine, and debate about what they know about subject matter, students, and classrooms? What might be the ***professional participation knowledge*** teachers need in order to construct and *use* their wisdom of practice in critical conversations about teaching and learning?

Conscious of the magnitude of the claim that what Lisa and I engaged in together was a domain of knowing and learning distinct from other kinds of knowledge, I want to proceed with my description of this distinction. I do so with confident uncertainty (Ball, personal communication, 1995) that others engaged in the reforming of teachers' professional development may affirm, challenge, or clarify the framework I set out in ways that contribute our efforts to understand what "teachers need to know, and know how to

do, in order to offer instruction that would support much deeper and more complex learning for their students?" (Ball and Cohen, in press).

Professional participation knowledge includes understandings and skills that enable a teacher to construct contexts for and to engage in shared public work on learning about teaching and learning. Where knowledge for teaching includes, for example, knowledge of subject matter, knowledge of learning and learners in context, and knowledge of curricula, professional participation knowledge supports active public engagement, investigation, and sense-making of problems, questions, and issues that emerge as teachers act on their knowledge for teaching. I return to Shulman's work and draw on an example he uses to illuminate what I am calling here professional participation knowledge.

Shulman and his colleagues observed, documented, and studied the expertise and skill of a secondary teacher. They drew on Piaget's methods of study and began to identify, label, and organize what this teacher was able to do: what she knows and how she uses what she knows to engage her students in the study of literature. Shulman and his colleagues were interested in learning how Nancy, the cooperating teacher in their study, used a conceptual framework in planning and teaching her high school English class. The researchers drew on her explanations, in part, to frame a developing knowledge base of teaching which Shulman likened to a chemist's periodic table, containing cells or categories yet to be identified. The question raised in the light of my work with Lisa is: Would this English teacher explain her conceptual framework as she did to Shulman if she were talking to an immediate peer? What else might she say; what might she not say?

How else might she use that framework to look at her teaching or her students' learning? What does that framework tell *her*, not her visiting researchers, about her growth as a teacher? It seems that these are questions that reference a different kind of work inside a teacher's practice.

I turn now to my work with Lisa in this study to further explore the notion of a domain of professional participation knowledge for its potential in helping us address the professional development needs of reform-*interested* teachers. To fully engage in professional development work where videotape might be helpful, that is, in conversations with like-minded critical colleagues, teachers may need to develop new categories of knowledge about teaching that reach beyond the knowledge they use inside their classrooms. They may need to develop knowledge that support their efforts create a professional learning community and to know how to participate in it in ways that are educative.

While I am acutely aware that the insights I have gained from my work with Lisa and the IMT group are only a beginning foray into a domain of knowledge I imagine is quite complex, I believe I can articulate four categories of professional participation knowledge reflected in the analyses reported here. Four categories of professional participation knowledge illuminated in this study are: (1) Knowledge of conversational rights and duties; (2) Knowledge of language use and meaning in dialogue; (3) Knowledge of self as teacher: relation of beliefs and actions; (4) Knowledge of self as learner: reflection on personal/professional growth.

Knowledge of Conversational Rights and Duties

In sharing a videotape of her teaching, Lisa drew on her understanding of the culture of teaching to create a conversational workspace around a videotape of her teaching. In preparing for a viewing session with her IMT colleagues she articulated her goals of wanting to see what others might see and to be pushed to think carefully about her mathematics teaching. She was seeking a conversational workspace in which to work on her knowledge of learners, contexts, and pedagogy—her knowledge for teaching. Her knowledge of the culture of teaching shaped the discourse and the extent to which the group could engage in critical examination of the video record. As the analysis showed, the rights and duties that governed the IMT discussion were more reflective of the culture of teaching that socialized Lisa to be an informant of her practice, than her envisioned role as an inquirer. In her reflections on the viewing session discussion, we saw Lisa construct an understanding of the importance of her framing and posing a question when using her videotape and the potential of the question to shift the discourse pattern of the group's talk. This understanding, constructed out of her reflections, stands as an example of the kind of professional participation knowledge Lisa needs to engage in critical conversation about her mathematics teaching.

Knowledge of language use and meaning in dialogue

Throughout the course of our work together, Lisa used what she knows about conversations with teachers in the IMT group to tailor her conversations with me so that

she could examine her own understanding of a set of concerns in her practice: her sixth graders' meaning in a description of their math work, the relation between her belief about student authority in the classroom and her own physical positioning in the room, her meaning and use of the term *curriculum* in discussions with other educators. Each concern emerged, in part, from Lisa's knowledge for teaching, specifically, her knowledge for reform-oriented teaching: knowledge of learners, knowledge of pedagogy, and knowledge of curriculum development. However, without knowledge of a kind of conversation that will value and support the exploration of this knowledge for teaching, Lisa's opportunities to intellectually scrutinize her meanings, her understandings and how they compare and contrast with the understanding of others was limited. Her conversations with me, in the context of this work, supported her continued practice in creating and participating in meaningful examinations of her work.

Knowledge of self as teacher: relation of beliefs to actions

To push her understanding of her own development as a reform-oriented teacher, Lisa initiated an inquiry, a small action research project, in company with her sixth-graders. Perhaps her struggle to achieve the kind of conversation she sought with the IMT group provoked her curiosity about her own students as resources for her learning about her teaching. In her journal writing and in conversations with me, Lisa used her growing awareness and understanding of her own experience as a learner to look for connections between her knowledge of pedagogy—small group discussions—and her knowledge of learners—their constructive participation.

Knowledge of self as learner: reflection on personal/professional growth

Working with Lisa in the context of her inquiry into groupwork highlighted some of the personal/professional costs to a teacher beginning to cross boundaries in the direction of new norms of collegial interaction: the problem of being too different; the challenge of leading and teaching others how to present *their* practice as part of trying to figure hers out for herself; and the realities and risks of being misunderstood. Lisa's inquiry illuminated how important it was to her that she keep inching her way forward in this direction; to succeed in crafting new ways of talking about her practice is in support of her commitment to continuing to learn to teach in response to the reforms. She used her knowledge of active intellectual engagement about her work to maintain her ties to the university, to join the IMT group, and to explore the potential of meaningful conversations in her school. With each course or study group she seemed to strengthen her sense of self as a thinker and deepen her commitment to the identity she would craft as a practicing teacher, grounded in inquiry and experimentation.

These four categories are a starting set and a beginning attempt to describe Lisa's development and use of her professional participation knowledge. I think it is important to note that within this study other categories of professional participation knowledge may have been employed as Lisa and I explored her use of videotapes of her mathematics teaching. Such possibility reflects the potential for me and perhaps others to continue learning from this work and these gathered research materials.

Continuing The Reform Of Teachers' Professional Development

I think there is a distinction in the current discourse about reforms that may be helpful in considering the significance of professional participation knowledge to a teacher's capacity to craft and sustain a reform-oriented practice. I think current reform efforts can be grouped into two categories (see Figure 10). In the first, education reform, reformers are concerned with re-conceptualizing the content and the processes involved in educating our youth. Education reforms address concerns about the core subject matter areas, ideas, principles, and skills needed for a productive citizenry in the 21st century. Additionally, education reform is concerned with the processes by which learners acquire, learn, and practice new knowledge and skills.

In the second category, school reform, the focus is on the re-organizing and the re-structuring of contexts in which new content and new learning processes are employed—where education reform take place. School reform addresses concerns about the resources and structures (temporal, organizational, and financial) that operationalize educational programs.

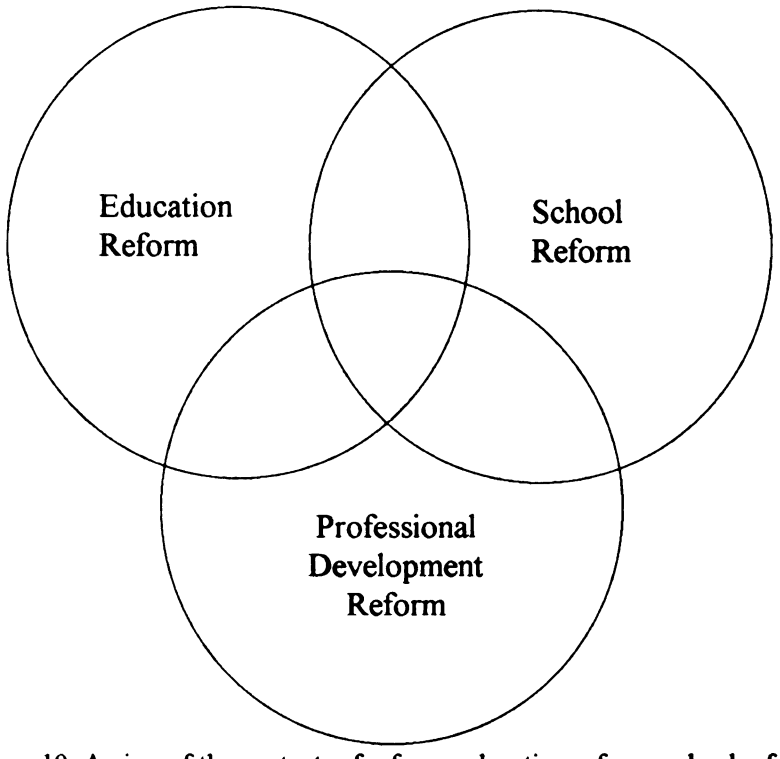

Figure 10. A view of the contexts of reform: education reform, school reform, and professional development reform.

The work of the reforms is complex, interrelated, and labor intensive. It seems the complexity lies, in part, in historical and paradigmatic forces that enable schools to operate and that permit them to attempt innovation without much real change to the culture that defines and directs life in schools. Many have tried to change what gets taught in school or how children engage in their work. But, in doing so without fundamentally changing the structure of the school day or the year, or without reconceptualizing the organization of groups of teachers and learners, or without reconceiving of the use of resources these would be reforms have only distorted and weakened a shared vision for improved education in schools.

The work in these arenas is and will continue to be labor-intensive, as all reform-oriented educators work upstream against long standing conceptions of roles, work relations, authority structures, perspectives on where professional knowledge comes from, and the decision making about what happens specifically in the classroom.

Many reformers aim to create real change through the work of classroom practitioners. Reflected in the increasing visibility of teachers engaged in action research, organizational leadership, and professional development facilitation, many reformers believe it is the teacher who will make the kinds of sustaining changes that result in quality improvements for student learning. It seems easier to think of teachers as central to education reform—changing what students learn and how they learn it—than to think of teachers as central to financial, organizational, or structural change. However, the extent to which these arenas become interdependent, influencing, guiding, and supporting authentic change in each, is dependent in large measure upon classroom teachers who can imagine the possible impact of new approaches to teaching, enact experimentations, and articulate meaningful connections to others outside the classroom.

And so, it follows that a third arena of reform is the professional development of teachers (see Figure 10). To influence real and lasting change in schools, we must place a tremendous amount of attention and resources on the professional learning and development of the classroom practitioner who will shape and revise and enact the visions of education and school reform.

Reflecting on my work with Lisa and the lessons learned in our collaboration, I have generated the following descriptors of this reform-oriented teacher:

1. Has active working knowledge for teaching in the classroom. This includes knowledge of content, pedagogical content, curriculum, pedagogy, learners, contexts, and purposes.
2. Holds models and images of what is possible for student learning, as proposed in education reform literature. This involves a paradigm shift in perspective on the kind of learning that can take place in school settings. This shift is a move away from the teacher's apprenticeship of observation or early teaching career, likely both.
3. Acts on a critical awareness of the culture of teaching: that it exists; that it has powerful influence on teacher communication and action in school; that a different culture is needed to support sustained reform work, and that s/he must have a role in shaping such a culture.
4. Acts on a view that the work of teaching extends beyond the classroom and therefore requires different skills beyond pedagogical work, for example. Specifically, she seeks skills for creating and sustaining critical conversations with colleagues about teaching practices, beliefs, and questions.
5. Reflectively attends to her identity as a teacher who engages in critical colleagueship. That is, she possesses a stance toward moving beyond sharing ideas and supporting one another through the change process "to confronting traditional practice—the teachers' own and that of his or her colleagues—with an eye toward wholesale revision" (Lord, 1994, p. 193).

A reform-oriented teacher is a practitioner who has the knowledge and skill to contribute to the profession at both the micro-level of classroom work and the macro-level of institutional work. I think it is becoming clearer to reformers and teacher educators—and to many teachers—that the changes called for cannot be realized if microwork is the concern of the teacher and macrowork is the concern of everybody else outside the classroom. A reform-oriented teacher must have the intellectual resources, skills, and

support to move back and forth between these levels of reform. Such a shift in our profession's perspective on individual classroom teachers' work, emerging with our increasing clarity about the complexity and magnitude of current reforms, requires a shift in the kinds of knowledge teachers need to fully participate as reform-oriented practitioners. This study, my collaborative work with one teacher learning to teach math in new ways, offers some insight into what teachers may need to know to share their wisdom of practice and to transform it into tools and resources that support their continual learning and development as teachers.

New Questions For New Work

Through this study I have gained an understanding of the need for teachers to construct and use what I have called professional participation knowledge in order to engage in sustainable reform-oriented practices. Learning that this knowledge for participating with colleagues is distinct from other knowledge teachers hold and use raises many questions. As a field, we might advance our understanding of teacher knowledge for practice by exploring further what is involved in creating and sustaining the transitive support communities in which teachers construct the professional participation knowledge needed for the "critical practices" (Little, 1982) called for in the reform literature.

As researchers, both university-based and school-based, we can pursue questions that help us further define the nature and content of professional participation knowledge. If knowledge "categories" is seen as an appropriate structure, what are the categories of

knowledge teachers develop and use when working with colleagues?

Reflecting on the preliminary categories suggested by this study in relation to current literature on professional development I can imagine questions about additional categories that may be explored in future research work: What is the nature of teachers' knowledge of argument and is it transformed through reform-oriented work with colleagues? In what ways? What knowledge do teachers hold about evidence and its relation to claims made about teaching and learning. What is the relation of teachers' knowledge of research literature to professional interactions around instruction? What is the nature of teachers' knowledge of theoretical frames and how is this knowledge used in interactions with other educators?

Exploring a range of possible categories that might be included in a domain of professional participation knowledge creates opportunities for researchers and teachers together to build a language that clarifies and delineates this kind of knowledge in relation to other forms that constitute a knowledge base for a professional practice.

As teacher educators, both university-based and school-based, we can create and sustain transitional support communities in which teachers can observe, develop, and practice professional participation knowledge in use. The rapidly expanding literature on teacher groups offers a wealth of imagery and language for crafting communities in which reform-oriented educators can create and participate in boundary conversations about practice. I think there is great promise for real change in education through learning communities that foster exchanges of knowledge and norms between university- and

school-based practitioners. Such exchange support teachers moving out from their knowledge community of instruction into meaningful participation in arenas of work formerly conducted by administrative leaders and researchers. Likewise these exchanges, support teacher educators and researchers in acquiring the necessary understanding and skill to authentically participate in long term work with classroom practitioners.

As teachers, both university-based and school-based, we can seek out and participate in opportunities to work collectively in tasks that require our collaborative engagement as educators across cultural boundaries of research, innovation, and practice. In such continual collaboration, I believe, lies the potential to develop and use a shared language for the teaching as a practice. As I bring this research project to a close, completing my graduate studies and creating new contexts for my continued learning, I am struck by a rapidly growing spectrum of professional development opportunities. Many teachers are finding ways to respond to the tug of intellectual hunger without leaving their work in classrooms. I have met teachers who are striving to continue developing as intellectually alive adults and thoughtful practitioners by keeping their learning grounded in daily interactions with children, parents, and other educators. These teachers' commitment to stay in the classroom brings with it a profound psychological and social struggle, about which the field of education is only beginning to raise questions.

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