Learning to teach in a coteaching community of practice

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LEARNING TO TEACH IN A COTeaching COMMUNITY OF PRACTICE

Dissertation
by
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of the requirements for the degree of
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ABSTRACT

Learning to Teach in a Coteaching Community of Practice

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As a result of the standards and accountability reforms of the past two decades, heightened attention has been focused upon student learning in the K-12 classrooms, classroom teacher practice, and teacher preparation. This has led to the acknowledgement of limitations of traditional field practicum and that these learning experiences are not well understood (Bullough et al., 2003; Clift & Brady, 2005). Alternative models for student teaching, including those that foster social learning experiences, have been developed. However, research is necessary to understand the implications of these models for preservice teacher learning.

Drawing on sociocultural theoretical frameworks and ethnographic perspectives (Gee and Green, 1998), this qualitative research study examined the learning experiences of a cohort of eight undergraduate preservice secondary science teachers who cotaught with eight cooperating teachers for their full practicum semester. In this model, interns planned and taught alongside multiple cooperating teachers and other interns. This study centers on the social and cultural learning that occurred within this networked model and the ways that the interns developed as high school science teachers within a coteaching community of practice (Wenger, 1998).

This study utilized the following data sources: Intern and cooperating teachers interviews, field observations, meeting recordings, and program documentation. Analysis
focused on community and interpersonal planes of development (Rogoff, 1995) in order understand of the nature of the learning experiences and the learning that was afforded through participant interactions.

Several conclusions were made after the data were analyzed. On a daily basis, the interns participated in a wide range of cultural practices and in the activities of the community. The coteaching model challenged the idiosyncratic nature of traditional student teaching models by creating opportunities to learn across various classroom contexts. In different classrooms, there were markedly different constructions of teacher practice and participant roles. The implementation of the coteaching model also resulted in the creation of an interconnected network of colleagues. In the resulting learning community, coteachers supported one another’s developing practice and critically examined their shared practice.
This dissertation would not have been possible without the support and encouragement of many. I would like to begin by thanking State University’s cohort of coteaching interns and cooperating teachers who welcomed me into their classrooms at Biden High. They were incredibly generous, sharing with me their joys and struggles as they grew and learned to work together. This project would not have been possible without them.

I would like to thank my committee, for sticking with me through two different dissertation topics, relocations, pregnancies, and numerous unexpected events that slowed down my progress and ground away at my fortitude. Their on-going commitment to my work was invaluable. I greatly appreciated Janice Jackson’s on-going support, encouragement and her commitment to my success. She helped me to preserve through the challenges and barriers that I encountered along the way. Marilyn Cochran-Smith’s careful reading of my documents and thoughtful, pointed advice helped me to focus my work and think about necessary revisions and ways to push this study forward. Most of all, thanks to Curt Dudley-Marling who was willing to support my research and writing despite the fact that I was working from miles away. I appreciate his quick response to emails and continued willingness to discuss on-going progress whenever necessary.

Throughout the process Curt was quick with feedback and always available to discuss the theoretical aspects of this work. His familiarity with my theoretical frameworks and
support allowed me to pursue this work and shape the study in a way that made theoretical sense.

I am particularly grateful to Kathryn Scantlebury for introducing me to coteaching, involving me in her research, and helping me to open up my own opportunities for this study. Kate was instrumental in supporting the on-going progress of this project by providing local research affiliations, office space for writing, and continued library access and research support. Kate also introduced me to researchers and authors who have shaped the field and the international network of coteaching. Her on-going mentorship has enabled me to grow as a researcher and scholar. Through my work with her I have been able to think about and extend my understanding of agency and also what it means to learn in and with others through the process of collaboration and coteaching. Other coteaching researchers have also helped me extend my thinking and analysis of the data, Beth Wassell, Colette Murphy, Matt Juck listened to my ideas, asked pointed questions, and helped me to extend my understanding of this work and further my writing.

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CHAPTER 1: THE DILEMMAS OF LEARNING TO TEACH WITHIN FULL PRACTICUM EXPERIENCES

As a result of the standards and accountability reform efforts of the past two decades, heightened attention has been focused upon student learning in the K-12 classrooms, classroom teacher practice, and teacher preparation (Cochran-Smith, 2001a, 2001b; Cochran-Smith & Fries, 2005; Wilson & Berne, 1999). It has been noted that in order for teachers to teach in ways that successfully support student learning, teachers must be well-prepared and engage in practice as on-going learners who critically examine and reflect upon their practice in order to improve their work with students (Ball & Cohen, 1999). Within this time of heightened attention on issues of teaching and learning “there is growing recognition of the shortcomings of traditional patterns of field experience, particularly of student teaching, and awareness of how little is known about what is actually learned in the field” (Bullough et al., 2003, p. 57). Points made by Bullough et al. have also been noted in recent syntheses of the research literature on student teaching (Clift & Brady, 2005; McIntyre, Byrd, & Foxx, 1996; Wideen, Mayer-Smith, & Moon, 1998). Numerous alternative models for student teaching have been developed with the intent to improve the student teaching experience.

Increased awareness about the need to strengthen teachers’ learning experiences has been coupled with a heightened awareness of sociocultural models of learning and their implications for educational research, teacher education, and science teacher education (Moll, 2001; Putnam & Borko, 2000; Smardon, 2008; Wilson & Berne, 1999).
Paired student teaching placements (Bullough et al., 2003; Gardiner & Robinson, 2008) and coteaching (Murphy & Scantlebury, 2009; Roth & Tobin, 2002; Tobin & Roth, 2006) have been developed as models for learning to teach with the aim of fostering social learning experiences within full practicum settings. Professional learning communities have also been promoted as an approach for fostering inservice teacher learning and collaboration (Borko, 2004; Little, 2003; Stoll & Louis, 2007b). As McLaughlin and Talbert (2007) noted, in 1996 the National Association of Secondary School Principals promoted professional learning communities as a means for reforming high school culture and improving teaching practice. Despite being valued approaches for supporting teacher learning (Putnam & Borko, 2000; Wilson & Berne, 1999), there has been little research to date on the experience of learning to teach within full practicum learning communities. Research is necessary to understand the implications of new models for preservice teacher learning and development (Wideen, Mayer-Smith and Moon, 1998). Furthermore, there is a need to understand the potential of social, collaborative, and situated learning models as part of the full practicum experience and the process of learning to teach (Putnam & Borko, 2000).

The purpose of this chapter is to situate this research study within the current context of the field of teacher education research, policy, and practice. In this chapter, I first draw on the research literature to describe some of the dilemmas surrounding traditional student teaching models and recommended directions for future research. I then briefly discuss coteaching as an approach for learning to teach. This is followed by a discussion of the central aims of this study, research questions, and main arguments. Key
terms and definitions are then introduced. This chapter concludes with an overview of the organization of the dissertation.

**Traditional Full Practicum Experiences: Problems and Possibilities**

Student teaching has traditionally been perceived as a time to create “the bridge between the theory, knowledge, and skills gained at the university and their application in the classroom” (Wideen, Mayer-Smith, & Moon, 1998, p. 152). Typically located at the end of teacher education programs, student teaching ideally provides opportunities for hands-on experiential learning in an actual classroom setting and the chance to apply theories learned in teacher education programs in practice. Teachers often cite their field experience as the most valuable component of their teacher education program (Feiman-Nemser & Buchmann, 1985, 1987; Guyton & McIntyre, 1990; McIntyre, Byrd, & Foxx, 1996) and teacher educators have recognized the rich potential of the student teaching experience (Feiman-Nemser & Buchmann, 1987).

Traditionally, individual student teachers are assigned to work with one cooperating teacher during their student teaching experience; the research literature cites numerous problems with this model. As McIntyre, Byrd, and Foxx (1996) describe, student teaching “prepares teacher candidates for the loneliness of the classroom, not for reflection, networking, or collegiality” (p. 173). It has been argued further that student teaching inculcates preservice teachers into a culture of isolated practice while also providing constraints on preservice teachers’ abilities to implement new theories and create change within the “inherited context” (Britzman, 1991, p. 20) of the cooperating
teachers’ classroom (Britzman, 1991; McIntyre, Byrd, & Foxx, 1996). McIntyre et al. write that “typical student teaching experience emphasizes imitation and subservience to the cooperating teacher rather than emphasizing investigation, reflection, and problem solving" (1996, p. 173). While some of this results from power differentials between cooperating teachers and student teachers, it also is a result of limited knowledge about and access to the cultural tools of the profession, limited knowledge of the field, and existing classroom structures. Working with one cooperating teacher provides an idiosyncratic experience in which student teachers gain experience within a single classroom and access to perspectives of a single experienced teacher. This limits preservice teachers’ opportunities to understand the broad types of classroom experiences and range of teacher perspectives towards practice and indoctrinates preservice teachers into the cultural isolation of classrooms.

Student teaching can be an overwhelming process. It is argued that in traditional student teaching models preservice teachers are not only limited in their ability to create change in their student teaching classroom, but also that the traditional model “appears to limit the ability and inclination of preservice teachers to do anything other than just survive" (Wideen, Mayer-Smith, & Moon, 1998, p. 156). The tremendous demands on student teachers often cause student teachers to focus on a “narrow range of classroom activities” (McIntyre, Byrd, & Foxx, 1996, p. 186) with an eye towards classroom management (Clift & Brady, 2005) and the pragmatic (Wideen, Mayer-Smith, & Moon, 1998). Additionally, student teachers are not always sure how to implement ideas in the classroom, this is particularly challenging when the preservice teachers perspectives
about practice do not align with those of their cooperating teachers. Clift and Brady (2005) explain that,

Even when pre-service teachers believe in teaching a certain way, they often do not know how to act upon that desire or how to deal with difficulties they encounter. Moving to action is more difficult than the intention to do so. (p. 322)

Frequently preservice teachers’ classroom attention shifts from student learning and subject matter towards dealing with immediate managerial issues. As a result, student teachers frequently have a narrow focus on the classroom and their role as a teacher.

Additionally, McIntyre et al. (1996) note, “practice alone does not always lead to analysis, reflection, and growth on the part of the novice teacher” (p. 171). As Loughran (2002) has argued that preservice teachers need teacher educators, supervisors, and cooperating teachers to help them to critically examine their experiences and learn how to reflect on practice in way that informs future classroom action.

Cooperating teacher perspectives about practice strongly influence preservice teachers. Clift and Brady write that "pre-service teachers often saw cooperating teachers’ views, beliefs and recommended practices as the most salient in field experiences, even when the pre-service teachers disagreed with them" (2005, p. 314). Further, McIntyre and coauthors have found that preservice teachers are typically passive in their interactions with cooperating teachers, and that the emphasis of conversations frequently focuses around procedural issues “with no serious reflection or analysis of teaching” (Guyton & McIntyre, 1990, p. 524) and little discussion about the curriculum or student learning (McIntyre, Byrd, & Foxx, 1996). Likewise, Smith (2005; 2007) has found in planning
meetings interns typically defer to their cooperating teacher, even in instances where they do not agree. The limited nature of the dialogue between cooperating teachers and student teachers is of significant concern, because preservice teachers may not engage in rich discussions about the work of teaching, or to critically reflect on their work with supportive and thoughtful colleagues. As Smith (2007) has argued, there is a need to reframe the power structures between cooperating teachers and student teachers in order to create supportive contexts for “thoughtful co-inquiry and deliberation about practice” (p. 101).

Within the past 20 years there has been increased attention to social approaches for learning. This shift in learning from a more transmission model of learning has been linked to the translation of Vygotsky’s works into English in the late 1970s through 1990s (Moll, 2001). Within this time period there has been the development and implementation of collaborative models for learning to teach. Many of these models seek to change the inherent culture of the student teaching experience. Throughout the literature there is a call to develop reflective practitioners who are analytic and cognizant of the role that they play in the school environment and of their impact on student learning (Cochran-Smith & Lytle, 1993; Loughran, 2002; McIntyre, Byrd, & Foxx, 1996). Research suggests that preservice teachers need clear and consistent messages about good teaching and strong on-going support from university faculty and cooperating teachers who are reflective and analytical of their practice and function work on-site with student teachers as teacher educators (Feiman-Nemser, 1998, 2001). It has been suggested that by incorporating student teachers in collegial work relationships such as
partnered student teaching experiences (Bullough et al., 2003), coteaching (Tobin & Roth, 2005), cohorts (Beck & Kosnik, 2001), or Professional Development Schools (Holmes Group, 1990) preservice teachers will be better supported in the process of learning to teach, better able to locate resources to support practice, and also be cognizant of contextual issues related to schools and teaching. Additionally, these structures should weaken the isolation common to teaching, and help to support a more communal perspective regarding the work of teachers.

Coteaching (Roth & Tobin, 2002) is a model for learning to teach that has been utilized by preservice and inservice teachers, and teacher educators/educational researchers to create a collaborative learning experience in which participants learn alongside each other through praxis. Coteaching is grounded in the belief that learning to teach is a sociocultural activity that provides teachers the opportunity to learn through situated interactions by teaching collaboratively in a supportive environment (Tobin, 2005, June; Tobin & Roth, 2005). In the coteaching model, cogenerative dialogues for examining collective practice are viewed as critical elements for learning about and shaping practice (LaVan & Beers, 2005; Martin, 2008). The increased interactions that result during coteaching are viewed as integral in the process of learning to teach.

By being in a class with other teachers, and coteaching with them, all coteachers experience many more interactions between teachers and students than would occur in a classroom with just one teacher and they also experience teacher-teacher interactions. The increased experience with interactions is a foundation
for learning to teach and constitutes a framework for learning to teach through coteaching. (Tobin, 2005, June, p. 2)

Tobin and Roth (2005) argued that during coteaching, the conscious and unconscious aspects of praxis become visible and teachers are able to share their insights, questions, observations, and emerging understandings and thus influence future practice. Roth and Tobin’s coteaching models have been studied and outlined in numerous publications (Roth & Tobin, 2002, 2005b; Tobin & Roth, 2005, 2006), and new coteaching models have begun to emerge throughout the United States and internationally (Eick, Ware, & Jones, 2004; Murphy & Scantlebury, 2009; Scantlebury, Gallo-Fox, & Wassell, 2008). However, research is still necessary to understand the implications of coteaching as a means for learning to teach (Bacharach, Heck, & Dahlberg, 2009).

While numerous new models of student teaching have begun to emerge, throughout the literature reviews on field experience are calls to better understand how these different models contribute to the learning to teach process (Clift & Brady, 2005; Guyton & McIntyre, 1990; McIntyre, Byrd, & Foxx, 1996; Wideen, Mayer-Smith, & Moon, 1998). Specifically the literature identifies the need to understand: the nature and the effectiveness of different models; the context of the student teaching experiences; and the need to incorporate the perspectives and voices of participants in existing studies (Clift & Brady, 2005; Guyton & McIntyre, 1990; McIntyre, Byrd, & Foxx, 1996; Wideen, Mayer-Smith, & Moon, 1998).

With respect to scholarly research on the full practicum experience, Wideen, Mayer-Smith and Moon (1998) and Clift and Brady (2005) identify the need to broaden
the field’s understanding of what occurs within the student teaching experience. Clift and Brady (2005) noted that early research on field experiences had predominantly focused on the roles of what different stakeholders in the student teaching experience do. They identified the need for a more complex understanding of the process of learning to teach, calling for researchers to focus on what preservice teachers learn and “how their learning was enacted in different contexts” (p. 310). Furthermore, teacher belief structures and attitudes often play a central focus in research on the field experience (Clift & Brady, 2005; Wilson, Floden, & Ferrini-Mundy, 2001). There has been a call for researchers to move beyond this research area into examining other aspects of the practicum experiences (Wilson, Floden, & Ferrini-Mundy, 2001). Zeichner (2005) in his synthesis of the findings of AERA Research Panel on Research and Teacher Education, noted that much of the existing research on teacher education components, “pay[s] little attention to how teachers’ knowledge and practices are influenced by what they experience in teacher education programs… There is a clear need to look more at how teachers’ knowledge and practice are shaped by their preparation…” (p. 742). There is clearly need for expanding the focus of research on learning to teach within the full practicum experience.

Additionally, both Clift and Brady (2005) and Wideen et al. (1998) focused attention to the need to better understand the ecology and context of the field experience. Wideen et al (1998) wrote, “more attention needs to be directed at in-depth study of how other players affect the landscape and process of learning to teach” (p. 169). Also they suggest that theoretical frameworks for understanding learning might shift from the individual experience to that of the collective. For example, Clift and Brady (2005) write,
“frameworks for research should move beyond behavior and cognition, beyond a limited focus on the individual (alone or in a group) and toward a more sophisticated knowledge of how practice is shaped by contexts, materials and other people” (p. 335). While only a few researchers have begun to construct their studies utilizing a sociocultural framework, doing so enables researchers to, “examine how social and cultural norms, patterns and histories of institutions and specific settings impact cognition and behavior” (Clift & Brady, 2005, p. 313). Such research approaches move the research literature “toward a more complex conceptualization of the interactive and social nature of developing one’s practice” (Clift & Brady, 2005, p. 325). Research that seeks to understand the sociocultural nature of learning asks new questions about the student teaching experience and requires a qualitative lens focused on the culture and experiences of the collective within a learning community.

In summary, empirical research and reviews of research literature on field experiences suggest that additional research needs to be done to better understand the student teaching experience, and that new questions and theoretical frameworks may help open up new understanding. Historically, researchers have asked questions about the roles of stakeholders and examined “generic teaching behaviors” (Clift & Brady, 2005, p. 325) in the content areas. Literature points to a need to ask new questions about the student teaching experience and also identifies the need to implement new frameworks for understanding the experience. Suggested research foci can provide new insight into the full practicum experience. Research focused on the contexts of student teaching can develop a greater understanding of what occurs within the landscape of student teaching,
ask questions about the role of the context in the student teaching experience and examine the process of learning to teach within the setting. By choosing a sociocultural lens, researchers can gain new insight into the student teaching “contexts for learning to practice and the social forces affecting practice” (Clift & Brady, 2005, p. 330). The research literature has identified the need to better understand the traditional student teaching experience. This need is magnified for alternative practicum models such as the coteaching model, which have only been utilized as an approach for learning to teach for one decade (Tobin & Roth, 2005).

State University’s Cohort Coteaching Model

In 2003, the Secondary Science Undergraduate Teacher Education Program at a mid-Atlantic State University in the United States shifted to a coteaching model for the full practicum experience. In implementing this change, the program director, Claire Lyons1, aimed to improve the secondary science preservice teachers student teaching experience which had previously been aligned with a traditional model for student teaching used by the rest of State University (Interview Claire Lyons, Program Administrator, November 11, 2003; Lyons, 2003). Claire grounded this programmatic shift in the empirical research on other coteaching models and experiences of colleagues who had implemented coteaching at other Universities including: the University of Pennsylvania (Roth & Tobin, 2001, 2002; Tobin, Zurbano, Ford, & Carambo, 2003), Auburn University (Eick, Ware, & Williams, 2003), and the University of Tennessee. As Claire described some reasons for shifting to a coteaching cohort experience, she noted the

1 All names and locations have been changed for purposes of confidentiality.
potential of the model to provide increased opportunities for cooperating teachers and interns to participate in “reflective practice,” and the potential for creating a “community of learners” who could have professional conversations about practice, planning, and assessment with a focus on students. She viewed the cohort model as a way to minimize preservice teacher isolation within a setting while also addressing the idiosyncratic nature of the student teaching experience, which traditionally places one preservice teacher in one cooperating teacher’s classroom. Furthermore, she cited empirical and theoretical research on coteaching, and her direct experience with the coteaching model at the University of Pennsylvania (Interview Claire Lyons, Program Administrator, November 11, 2003; Fieldnotes).

The model of coteaching used at State University is the only cohort model of coteaching that has been described in the research literature. Additionally, this is the only coteaching model in which teaching interns work with multiple cooperating teachers including special educators in inclusion classrooms at the secondary level, and one of only a few models where interns coteach with peers (Kamens, 2007; Tobin & Roth, 2005). There are a wide range of coteaching models implemented worldwide (Murphy & Scantlebury, 2009; Roth & Tobin, 2005a; Tobin & Roth, 2006). State University’s coteaching model has been utilized since the 2003-2004 academic year. The preservice teachers are paired by discipline, and each participant works with multiple cooperating teachers and special educators each day. This particular coteaching model has not yet been thoroughly studied; research is necessary to understand the learning experiences of preservice teachers who participated in State University’s secondary science coteaching cohort.

This dissertation presents findings from an ethnographic study of the second year of implementation of State University’s cohort coteaching model. It examines the
experiences of a cohort of eight teaching interns who, along with eight cooperating teachers, created a coteaching community of practice (Lave, 1996; Wenger, 1998) during a 16-week full practicum at Biden High School in the Spring semester of 2005. Using a sociocultural lens (Murphy & Carlisle, 2008; Rogoff, 1995; Stetsenko, 2008) the experiences of these coteachers are examined to develop an understanding of the nature of the learning experience and to develop a greater understanding of what occurred within the full practicum experience. The interns are the central focus of this study, however, learning of the cooperating teachers and cultural changes that occurred within this setting are also addressed, though to a lesser extent. The question that initially framed this study was:

- What happens when secondary science teaching interns are immersed in a cohort coteaching model for their full practicum experience?

As the study evolved additional questions emerged and helped to focus ongoing data collection and data analysis. This is not an unusual phenomenon within ethnographic traditions of research (Carspecken, 1996; Carspecken & Apple, 1992; Hammersley & Atkinson, 1983; Spindler & Spindler, 1992; Thomas, 1993). During my work in the field the following sub-question also emerged:

- What is the nature of the learning opportunities afforded to interns within State University’s coteaching model?

As part of this sub-question I paid attention to the roles of context and coteacher interactions as a part of the learning experience. I also sought to understand the learning
opportunities afford through participation in the coteaching community’s culture of practice.

This study set out to examine what happened when eight undergraduate secondary science preservice interns participated in a cohort coteaching model for their full practicum field experience. As the ethnographic study progressed it became clear that the interactions of the coteachers were critical to the process of teaching and learning within the setting. Furthermore, it became apparent that the coteachers (teaching interns and cooperating teachers) were a collective of practitioners who learned together as they cotaught and coconstructed their practice in the high school setting. These coteachers formed a “community of practice” with three shared dimensions of practice identified by Wenger (1998): “shared purpose”, “joint enterprise” and “shared repertoire” (p. 73). The coteaching experience was a collective teaching experience in which interns and cooperating teachers worked collectively to meet the needs of the high school students in their science classrooms. Together they shared the responsibilities and workload of the classroom, and negotiated collective meanings for practice. Coteachers interacted throughout the day in multiple venues including formal (e.g. teaching and co-planning sessions) and informal situations (e.g. lunch and carpools). As coteachers interacted, opportunities for learning were afforded (Little, 2002, 2003) and collective meanings of practice were negotiated (Lave & Wenger, 1991; Wenger, 1998). I argue that the coteaching model for learning to teach supports rich learning experiences in which preservice teachers become members of the teaching profession while learning cultural practices of teaching and also transforming the context within which they learn.
Additionally, it is argued that while aspects of cultural practice were reproduced, others were resisted or transformed as the interns became members of the professional community and developed identities as high school science teachers.

**Definition of terms**

For the purposes of this study the term *teacher practice* includes and extends beyond classroom instruction and work with students to include work with colleagues; conversations with coteachers about practice; reflection on practice; preparation for instruction including formal co-planning sessions, informal preparation periods, independent work at home; and interactions about aspects of the work of teaching with parents, students and other colleagues outside of instruction. In this study *learning* is understood as a sociocultural process in which, “learning is an integral aspect of activity in and with the world at all times” (Lave, 1993, p. 8). Drawing on sociocultural theories of learning, this study grounds conceptions of learning within the assumption that learning occurs through participation (Lave & Wenger, 1991; Wenger, 1998) and the process of “shared contribution” (Murphy & Carlisle, 2008). Furthermore, “*development* is [understood as] a process of transformation through participation in cultural practices” (Goodnow, Miller, & Kessel, 1995, p. 41) “rather than of acquisition” (Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995, p. 46). This study examines learning through three lenses, at the level of community, interpersonal, and personal planes (Rogoff, 1995), and examines both learning affordances, or opportunities for learning, and also changes in participation within these planes. Little (2003) explains that *affordance* "helps specify
and locate the available resources for learning while acknowledging the inherent ambiguity, open-endedness, and indeterminacy of social practices and learning” (p. 920). It is in the situated co-construction of practice, debates and challenges of assumptions, and reflection on practice that all teachers were afforded opportunities for development. In a discussion of the situated nature of learning in community, Lieberman (2007), citing Wenger (1998) writes,

‘Learning as social participation shapes not only what we do, but also who we are and how we interpret what we do’. For him [Wenger] learning communities become arenas for professional learning because the people imbue activities with shared meanings, develop a sense of belonging, and create new identities based, in part, on their relationships with one another. (p. 199)

These learning opportunities will be explored for all participants as represented in the data across the semester of coteaching. At issue will be the question of what types of learning opportunities are “afforded” or available to preservice teachers involved in coteaching experiences and in what ways these learning experiences appear to shape their development and identities as high school science teachers.

In the context of this research study student teachers are called interns. This reflects interns’ role within the coteaching community of practice where they are viewed, not merely as students of teaching, but as legitimate community members and teachers, albeit in the early stages of their professional teaching career, who are expected to participate fully in the practice of teaching (Scantlebury, Gallo-Fox, & Wassell, 2008). Furthermore use of the term full practicum is used to describe the student teaching
semester. The term student teaching was not used by the program administrator who developed the coteaching model implemented by State University; rather she identified this learning experience and the State University model for learning to teach in the full practicum setting by the term “coteaching.” In this dissertation, the term student teaching is used to describe more traditional understandings of the full practicum experience in which single preservice teachers are assigned to work with one cooperating teacher, then following a time period of observation, the student teachers then gradually assume responsibility for larger portions of the cooperating teachers instructional schedule (McIntyre, Byrd, & Foxx, 1996). In coteaching, coteachers (interns and cooperating teachers) share the responsibility for the classroom and the instruction of students, communicate to develop mutual understanding for their shared practice, and together draw on a sense of mutual respect which values the contributions that all members bring to their practice. These three key elements of coteaching have been identified in the literature as co-responsibility, co-generative dialogues, and co-respect and have been found to be essential in successful coteaching experiences (Scantlebury, Gallo-Fox, & Wassell, 2008).

As used in this study and throughout the coteaching literature, the term coteaching has two meanings. It specifically refers to the act of collectively teaching students with multiple teachers in the classroom all focused around issues of student learning and instruction. This usage reflects how the participants in this study used the term. At a programmatic level, however, the term coteaching refers to the learning to teach model as an entire entity and encompasses all the practices that occur within it.
Finally, bridging theoretical work on “coteaching” (Roth & Tobin, 2002, 2005b; Tobin & Roth, 2006) and that on “community of practice” (Lave & Wenger, 1991; Wenger, 1998), I have developed the term “coteaching community of practice.” I use this phrase throughout this study to describe the networked professional learning community that developed during the full practicum semester. The terms community of practice (Wenger, 1998), teacher learning community (Little, 2003), and professional learning community (Stoll & Louis, 2007b) are used interchangeably.

**Overview of the organization of the dissertation**

The nine chapters of this dissertation present the experiences of eight preservice teachers learning to teach within a coteaching community of practice. Chapter 2 moves beyond situating the research study to present three bodies of the research literature including the sociocultural theoretical framework for this study. The review of literature begins with an overview of the process of learning to teach within student teaching practicum experiences with particular attention to learning to teach secondary science. Next the literature on collaborative models for learning to teach, with an emphasis on coteaching is reviewed. Finally, the sociocultural theoretical framework of learning as participation and a transformative process of shared contribution is described. This section also presents theoretical work about communities of practice. Chapter 3 provides an overview of the research design and methodology for this study. This chapter provides rationale for ethnographic approaches, description of Rogoff’s analytical framework for studying sociocultural learning experiences, and discussion of the role of the researcher in the study. It also provides a description of the research site, information about the
coteaching participants, data sources collected for this study, and data collection and analytic approaches used for shaping the findings of this study.

Findings chapters center around the collective learning experience within the coteaching community of practice, they are organized by Rogoff’s analytical framework (1995) that proposes studying sociocultural learning across three planes: community plane; interpersonal planes, and personal planes with a primary focus on the community and interpersonal level. Chapters 4 and 5 address development at the community level, by examining cultural interactions within the coteaching community at Biden High School. Chapter 4 introduces the coteaching schedule, the coteachers’ daily routines, and provides evidence that this group of coteachers formed a professional community of practice. The purpose for this chapter is to provide understanding of the basic structures of the coteaching model and intern’s access and participation within the community in order to help readers develop a sense of the contexts that the coteachers worked in within the coteaching community of practice. Chapter 5 moves inside these structures to examine the networked community created by the coteaching assignments that placed interns with multiple cooperating teachers each day and created disciplinary sub-groups of coteachers who worked together. A cross-case analysis is presented to show the differences between three disciplinary sub-groups and to illuminate the different learning opportunities afforded within the varied contexts. Together these chapters examine the situated nature of the learning experiences at the community level within the coteaching community of practice at Biden High School.
Chapters 6 and 7 shift analytic focus to the interpersonal level of development. Analysis on this plane focuses specifically on the experiences of the Anatomy and Physiology teachers as they developed and implemented the opening lessons of a muscle unit. Central to the analysis of these chapters is attention to the ways that group interactions afforded rich opportunities for learning. Findings around the experiences of this “socially cohesive” (Siskin, 1994, p. 99) sub-community are split into two chapters. Chapter 6 presents findings around the interpersonal processes of this group with attention to the group dynamics and their dialectical contributions. Chapter 7 focuses on the group’s interpersonal ways of knowing by describing the situated knowing of the group through processes of collective and cultural knowing.

Chapter 8 concludes with discussion of what it means to learn to teach within a coteaching community of practice comprised of preservice teaching interns and cooperating teachers. Implications of this research study for the fields of teacher education and teacher learning are examined as are the limitations of the study. Finally, directions for future research are explored.
CHAPTER 2: THEORETICAL FRAMEWORK AND REVIEW OF THE LITERATURE

Sociocultural theories of learning have most frequently been applied in the fields of anthropology and sociology (Hutchins, 1995; Lave, 1993; Lave & Wenger, 1991; Wenger, 1998), business (Billett, 2002), organizational theory (Orlikowski, 2002), developmental psychology (Rogoff, 1990; Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995; Rogoff et al., 1993; Rogoff, Radziszewska, & Masiello, 1995), cognitive psychology (Cole), and sociolinguistics (Gee, 1992, 1996). Only recently have sociocultural theories of learning been utilized in the field of education (Moll, 2001; Smardon, 2008). There are several possible reasons that sociocultural theories of learning have not been broadly applied to the field of education. First of all these theories are relatively new to the field. Vygotsky’s work was only translated into English in the late 1970s and 1980s (e.g. Mind and Society), 1978 Furthermore, early writing about sociocultural theories emphasized a division between formal and informal learning contexts, and it was argued that there was a significant difference between the types of learning that took place in formal educational contexts versus settings outside of classrooms (Brown, Collins, & Dugiud, 1989; Lave, 1993).

Scholarly work about situated learning in the late 1980s and early 1990s strongly juxtaposed the theories of formal learning (school learning) and informal learning (learning within cultures or communities) (Brown, Collins, & Dugiud, 1989; Lave, 1993). For example, Resnick in her 1987 AERA Presidential Address argued,
Schooling focuses on the individual’s performance, whereas out-of-school mental work is often socially shared. Schooling aims to foster unaided thought, whereas mental work outside school usually involves cognitive tools. School cultivates symbolic thinking, whereas mental activity outside school engages directly with objects and situations. Finally, schooling aims to teach general skills and knowledge, whereas situation-specific competences dominate outside. (Resnick, 1987, p. 16)

I find that the emphasis between school and non-school settings clouds the argument of whether or not sociocultural learning theories are applicable for framing research into the student teaching full-practicum experience. While pre-practicum experiences are situated within classroom settings, preservice teachers are participating in the ongoing work of the profession and engaging in the cultural practices, the culture of teaching, and the tools of practice. Wenger (1998) writes, “Our perspectives on learning matter: what we think about learning influences where we recognize learning” (p. 9). Historically, field practicum experiences have been studied using a traditional lens for thinking about the learning that occurs within these experiences through a formal perspective. It has been anticipated that during the full practicum experience preservice teachers would apply the theories learned in formal teacher education courses. Additionally, questions have been raised about what is learned during practicum experiences. While academics have cited the frequent shortfalls of the practicum experience, classroom teachers often argue that this experience was the most valuable part of their teacher education experience. In this chapter, I argue that part of the disconnect between the perspectives of researchers and
practitioners may result from the theories of learning that were grounding the interpretation of the field experiences. What would have happened if a sociocultural framework of learning was applied to studies on the prepracticum experience instead of formal theories about learning in classroom settings? Would the conclusions of researchers been different with a theoretical framework that was attuned to the situated learning experiences of preservice teachers and their developing membership into the profession and their learning of the culture, Discourse and practices of the community?

Through this literature review, I substantiate the argument that a sociocultural framework is appropriate for interpreting the experiences of the preservice teachers within field practicum placements (school classroom settings) and the learning that occurs within these practicum placements. This literature review has three main components. First, a discussion of the sociocultural theoretical framework is presented in order to describe the ways that learning is understood and interpreted. This discussion provides the theoretical framework that is utilized in this study of learning to teach secondary science in a coteaching community of practice. Presented second is a brief review of the literature on learning to teach as it relates to secondary science within practicum experiences. Finally, a review of the coteaching literature is presented in two parts—an overview of the theories behind the coteaching model precedes a review of the ways that coteaching has been utilized to support experiences in learning to teach.

**Sociocultural theoretical framework**

There are numerous models of learning that are grounded in a sociocultural historical framework (Brown & Duguid, 1991; Gee, 2004; Lave & Wenger, 1991;
Vygotsky, 1978). Each of these theories shifts the process of learning from being situated within the individual to a process in which learning occurs within a social context. Putnam and Borko (2000) write that from a situated perspective “the physical and social contexts in which an activity takes place are an integral part of the activity, and that the activity is an integral part of the learning that takes place within it” (p. 4). A key understanding of sociocultural theories of learning is that learning occurs through participation (Lave & Wenger, 1991; Wenger, 1998) and the “process is the product.” As such it is critical to acknowledge that the central emphasis within such frameworks is not knowledge acquisition for the purposes of the transfer of information, but rather the appropriation of the cultural practices and learning the ways of talking and acting in ways that are aligned with the practices of community members (Lave, 1996). Therefore part of understanding what is learned and how learning occurs requires that researchers also develop a thorough understanding of the context and the cultural expectations within the setting where the learning is occurring.

A number of sociocultural theorists have argued that joining a new community prompts new members to develop the ways of speaking, thinking, and behaving of the group (Brown, Collins, & Dugiud, 1989; Gee, 1992, 1996; Lave, 1996; Lave & Wenger, 1991; Wenger, 1998). This process has been called “legitimate peripheral participation” (Lave & Wenger, 1991) and also the development of “Discourse” (Gee, 1992, 1996). Both theories provide insight into the process of becoming culturally acknowledged members of communities. However, Gee’s work tends to be applied broadly across all aspects of society, whereas Lave and Wenger’s works generally are more directed at the
process of becoming a member of a profession or occupational group. Within both theories, the learning that occurs is an integral part of the process of becoming recognized as a member of the new community. For example, as described by Lave (1996) in her research on Liberian tailors, the tailor apprentices in their daily participation in the tailor shop were:

learning many complex “lessons” at once. To name a few: they were learning relations among the major social identities and divisions in Liberian society which they were in the business of dressing. They were learning to make a life, to make a living, to make clothes, to grow old enough, and mature enough to become master tailors, and to see the truth of the respect due to a master of their trade. (pp. 151-152)

This learning occurred through the daily participation in the tailor shop and through both formal instruction and the on-going regularity of participation in the process of profession. Such learning is understood as a conscious and unconscious process of coming to talk, act, and think in a manner that is aligned with community culture and recognized by members as genuine. Drawing on the work of Bourdieu and Foucault, Gee (1996) describes Discourse as the following:

A Discourse, then, is composed of ways of talking, listening, (often, too, reading and writing), acting, interacting, believing, valuing, and using tools and objects, in particular settings at specific times, so as to display and recognize a particular social identity. Discourses create ‘social positions’ (perspectives) from which people are ‘invited’ (‘summoned’) to speak, listen, act, read and write, think, feel, believe and
value in certain characteristic, historically recognizable ways combined with their own individual styles and creativity. (Gee, 1996, p. 128)

Therefore, referring back to Lave’s (1996) example of the Liberian tailors, part of learning the Discourse of the community included learning to properly measure, cut and sew garments, knowing how to use the tools of the trade, and also knowing how to interact with both customers and other tailors in ways that were considered to be recognized as the actions of a tailor.

Discourse is a specialized subset of discourse (Gee, 1996, p. 131), one that is socioculturally situated and recognized by members of a community as authentic. Those who successfully use the Discourse of a community act in manners aligned with the culture of the community and are recognized as members of the group. This is a situated identity, one that is simultaneously shared by an individual and also the community. As Gee (1992) explains, “People act, but since it is Discourses that render their acts meaningful and recognizable, it is also Discourses that act” (p. 110). According to Gee, sociocultural learning within a community is not only about learning how to participate within the community’s activities in alignment with the expectations of full members, but it is also about coming to think, talk, and act in ways that are recognized as aligned with the practices of the community.

Gee’s work defines the concept of Discourse as an indicator of membership and serves to delineate the meaning of the term. Lave and Wenger (Lave, 1996; Lave & Wenger, 1991; Wenger, 1998) utilize this concept, although not the term, in their theoretical work about the process of becoming a member in a workplace community.
They refer to what is learned as “the ‘culture of practice’” (Lave & Wenger, 1991, p. 95) and place emphasis on the conceptualization of this as a process of learning through participation in the community. Lave and Wenger (Lave & Wenger, 1991; Wenger, 1998) call this “legitimate peripheral participation.” As Wenger (1998) writes,

The primary focus of this theory is on learning as social participation.

Participation here refers not just to local events of engagement in certain activities with certain people, but to a more encompassing process of being active participants in the practices of social communities and constructing identities in relation to these communities. … Such participation shapes not only what we do, but also who we are and how we interpret what we do. (p. 4)

They argue that the experience is a rich learning process in which newcomers to a professional community move from peripheral towards full participation in the community. This is a process of both developing the behaviors and practices of the community, and one of gaining legitimacy as a full member.

Lave and Wenger (1991) point out that there are many challenges to successful legitimate peripheral participation. Particularly problematic are issues of access. Two examples include limited access for observing experienced professionals and also barriers that limit full involvement in the “activities… of mature practice” (p. 76). One way that newcomers’ access to a profession might be limited would occur if they worked in settings away from the more experienced community members and were not able to observe or participate in the full range of activities of the profession. Such limited access to the complete work of the profession would limit a newcomer’s ability to understand
the full scope of the profession and the ways that masters act and talk in the presence of others (Lave and Wenger). Despite the challenges, Lave and Wenger argue that the experience is a rich learning process in which newcomers to a professional community move from peripheral towards full participation within the community. This is a process of both developing the behaviors and practices of the community, and one of gaining legitimacy as a full member. In essence it is a process of identity development.

Brown, Collins, and Dugiud (1989) in their article about sociocultural theories of learning (situated learning) place the strongest emphasis on learning in situ as apprenticeship and enculturation with no discussion about how such learning might change existing contexts. Gee positions theories around Discourse development as cultural socialization and reproduction. Little (2007) argues that the research literature has moved beyond this stance. Lave and Wenger (Lave & Wenger, 1991; Wenger, 1998) acknowledge that communities of practice can serve as sites for reproduction and often are a mechanism for perpetuating the negative aspects of culture—arguing that it is often a mechanism for perpetuating the negative aspects of a culture. However, like Rogoff (Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995) they also argue that communities are sites for the production of new knowledge that have the potential to transform existing culture (Lave, 1996, p. 152). For Lave and Wenger, learning and development occur across the professional life span and consist of a “centripetal process” of moving towards full community participation with the center of this process being an indeterminate, moving point that shifts within the developing community. Central to this process is changing practice and culture of the community in which even experienced
professionals learn across the life-span sometimes in response to the interactions with newcomers in the community. Lave and Wenger refer to these changes as “transforming practice.”

Stetsenko (2008) and Murphy and Carlisle (2008) have further extended work around the concept of cultural transformation, arguing that a more appropriate terminology of what occurs is learning through contribution. Stetsenko writes that an essential part of learning, development and human nature is contribution. She argues that participants learn through interacting within the community and also contributing to the context. Stetsenko describes this as transformative activism; this process leads to participant learning and also transformations of the existing community practices. Murphy and Carlisle’s (2009) work applies and extends Stetsenko’s theories to the field of coteaching and cogenerative dialogues. These authors find that when Stetsenko’s ideas are applied to collective coteaching experiences the development and nature of practice becomes a process of shared contribution.

One particular sociocultural theoretical framework that I draw on heavily in informing the interpretive portion of this study is the communities of practice model originally developed by Lave and Wenger (1991) and elaborated upon in Wenger’s (1998) later work. The communities of practice model is a conceptual framework of situated learning originally grounded in a model of apprenticeship that provides a framework to examine the learning that is afforded (Little, 2002, 2003) within the context of professional communities. I now describe the communities of practice theoretical model and how it is understood to work.
Communities of practice

Wenger writes, (1998) “Communities of practice provide a privileged context for the negotiation of meaning” (p. 77). It is within the interactions of practice that learning unfolds (Lave & Wenger, 1991). Learning within a community of practice is a process of participation through which one gains access to the actions, tools, language, and resources of a community. Through this process one moves from peripheral involvement towards full participation, becomes acculturated into the practices of the community, and develops new competencies and a transformed professional identity (Lave & Wenger).

Communities of practice are professional learning communities comprised of practitioners with varied experiences in the field. As newcomers join, they become integrated into the professional community through the process of legitimate peripheral participation (Lave & Wenger, 1991). This is a process of learning. Initial participation in a community through smaller but authentic and critical components of practice provides newcomers access to the knowledge and resources situated within the work environment. Through a spiraling process, newcomers assume greater levels of responsibility and become more fully integrated into the community. As they participate in the work of the community, they gain greater access to the resources and assume larger and more central roles within the community of practice. While it is a process with movement towards full participation, the notion of full participation is not a static or easily defined point within a person’s career. Instead, it is fluid and changes as participants interact within the community of practice. The notion of legitimate peripheral participation speaks to the
learning process of newcomers, however this model also addresses the learning of all
participants. Everyone involved in the community of practice is transformed via the work
that they do together. It is through the process of participation that learning occurs (Lave
& Wenger, 1991; Wenger, 1998). Part of this process occurs as newcomers introduce
new ideas, perspectives, and resources to the context, however it is also through the
interactions of the participants that new meanings about practice are negotiated and
learning occurs for all.

Some have argued that the notion of communities can be problematic, due to
issues around defining membership (Gee, 2004; Grossman, Wineburg, & Woolworth,
and addresses issues of membership and roles. He argues that communities of practice
can be identified through their shared characteristics of mutual engagement, joint
enterprise, and shared repertoire.

“A community of practice can be defined as an ongoing collective negotiation of
a regime of competence which is neither static nor fully explicit” (Eckert & Wenger,
2005, p. 583). This is an environment for transformation and learning for all community
members (Lave & Wenger, 1991; Wenger, 1998). Such transformation occurs as all
participants work together to share practices, help others develop new competencies, and
question, reflect, and introduce new resources and ideas to the community. All in the
community are impacted through the negotiation of meaning in practice. It is in the act of
sharing and reflecting on practice that the tacit becomes explicit and that new meanings
and practices are created. However, it is important to note that while communities of
practice are dynamic entities that effect all community members, the potential to both reproduce problematic practices and culture exists.

The term ‘community’ is often construed as a positive one. However Lave and Wenger warn that communities of practice, while places for learning, are not necessarily idyllic niches for learning and should not be overly romanticized (Lave & Wenger, 1991; Wenger, 1998). They warn that conflicts occur within communities of practice and that they are not necessarily a source of critical or emancipatory practice. Wenger writes,

Claiming that communities of practice are a crucial locus of learning is not to imply that the process is intrinsically benevolent. In this regard it is worth repeating communities of practice should not be romanticized: they can reproduce counterproductive patterns, injustices, prejudices, racism, sexism, and abuses of all kinds. In fact, I would argue that they are the very locus of such reproduction. (1998, p. 132)

Putnam and Borko (2000) also warn of the potential weakness of the situated learning model and caution that researcher be cognizant of and avoid the potential pitfalls.

In sum, the community of practice model is a conceptual framework for thinking about the learning that occurs within specific contexts and amongst participants engaged in mutual goals. These communities are environments where learning occurs through practice and by which all group members’ knowledge is transformed. The literature review that follows describes the literature on learning to teach as it relates to secondary science practicum settings.
Learning to teach secondary science

The literature base on the process of learning to teach is copious. It covers a broad range of experiences across a teacher’s lifespan and a wide-range of material that teachers need to learn. It is argued that the process of learning to teach begins with teachers’ *apprenticeship of observation* (Lortie, 1975) which occurs during a person’s K-16 educational experience. The research base also incorporates the time that preservice teachers spend in their education programs—completing educational coursework, method classes, and also field experiences such as pre-practicum and full practicum experiences, which are often referred to as student teaching. The research literature on learning to teach typically describes the process as ongoing across the professional lifespan of a teacher and also includes research and theoretical work about teachers early years in the classroom and also ongoing professional development and learning within the field (Feiman Nemser, 1983; Feiman-Nemser, 2008).

In addition to delineating the time periods for learning to teach, authors of the major literature syntheses of the field have worked to clarify what is learned across the professional lifespan. They argue that the literature covers a broad range of topics that teachers learn (Carter, 1990; Feiman Nemser, 1983; Feiman-Nemser, 2008; Munby, Russell, & Martin, 2001). Feiman-Nemser (1983) described the field as broad and disparate incorporating “developing a personal style” to “mastering content” and “completing a certification program” (p. 151). Furthermore, she pointed out that each of these aspects of learning to teach are embodied in different bodies of literature. She described the process of learning to teach across the professional lifespan, arguing that
teachers learned different things about teaching according to where they were in their careers as students and teachers. Carter (1990) noted that numerous studies focused on the dispositions and perspectives that preservice teachers and teachers brought with them to their practice and the impact of teacher education programs on changing these orientations. Furthermore, she framed the process of learning to teach in terms of the knowledge and decision-making and thinking processes that teachers needed to develop in order to be successful in the classroom. She highlighted many different types of knowledge that teachers needed to learn including pedagogical content knowledge and personal practical knowledge. She concluded that, “the range and complexity of what is learned in teacher education are enormous…. it is evident that teachers’ knowledge is not highly abstract and propositional…. it is experiential, procedural, situational, and particularistic” (p. 307). Most recently, Feiman-Nemser (2008) described the process of learning to teach as – the need to learn to think, know, act, and feel like a teacher.

It has been argued that different aspects of learning to teach are learned in formal university classroom settings from those learned within K-12 practicum and inservice classroom experiences (Feiman Nemser, 1983; Feiman-Nemser, 2008; Zeichner & Gore, 1990). Feiman-Nemser (2008) categorized the differences in terms of what is learned as “knowledge for teaching” versus “knowledge of teaching” (p. 699).

Besides knowledge for teaching which can be learned outside practice, teachers need knowledge of teaching which can only be gained in the context of their work. For example, teachers may anticipate what students will find difficult or
confusing, but they cannot know ahead of time how particular students will make sense of what they are learning. (Feiman-Nemser, 2008, p. 699)

Zeichner and Gore (1990) described the campus-based versus field-based components of teacher education as representing different notions of learning to teach. They write:

When we examine the socializing role of the professional component of preservice teacher education programs, we need to distinguish between campus-based and field-based elements because they represent different and often competing notions of the process of learning to teach. (p. 336)

While many teacher education programs involve preservice teachers in early field experiences that coincide with coursework, the student teaching component typically occurs at the end of a teacher education program. This practicum experience may coincide with a seminar, research seminar or final course designed to help the preservice teacher think about their experiences teaching in schools. However, the full practicum component almost always follows the university’s formal course work on teaching. While student teaching has traditionally been perceived as a time to create “the bridge between the theory, knowledge, and skills gained at the university and their application in the classroom” (Wideen, Mayer-Smith, & Moon, 1998, p. 152), there is also an implication that there is a semester’s worth of learning to be done in the context of an actual classroom. Oliver (2009) describes this time as critical to the development of secondary science teachers. He argues that the last year of a science education teacher education program, which he describes as typically incorporating the science methods course with field based experiences and a semester of student teaching is the semester, as the year for
making the transition from being a student to being a teacher, acknowledging that “teaching is the only profession requiring one to shoulder the full set of responsibilities on the first day of his or her career” (in press). He posits that, “The field experience is where individuals begin to become teachers” (in press). Because, the research study described in this dissertation centers around the field experience, the ongoing discussion of the literature that follows will center specifically on this component of the process of learning to teach.

Numerous research frameworks for conceptualizing the process of learning to teach have been utilized (Munby & Russell, 2001). Wideen, Mayer-Smith, and Moon (1998) argued that the three frameworks positivist, progressive, and social critique tend to be used. The situated perspective of learning has been used to study K-12 student classroom learning experiences, yet it has been utilized less frequently in the context of teacher learning (Putnam & Borko, 2000; Wilson & Berne, 1999). In 1998, Wideen et al called for more studies on teacher education that specifically used a broader ecological, or sociocultural perspective. This sentiment was reiterated by Clift and Brady (2005) and across the Report of the AERA Panel on Research and Teacher Education (Cochran-Smith & Zeichner, 2005). As of 2008, Smardon reported that sociocultural theories are beginning to be utilized more widely in research on science education.

Research into the process of teacher socialization, which is linked to research outside the field of teacher education, known as occupational socialization, is one way to develop understanding into the process of teacher learning within the context of school settings (Zeichner & Gore, 1990). As Zeichner and Gore describe it, “Teacher
socialization research is a field of scholarship which seeks to understand the process whereby the individual becomes a participating member of the society of teachers” (Zeichner & Gore, 1990, p. 329). Feiman-Nemser and Floden (1986) have pointed out that the process of teacher socialization have often been perceived negatively, “because it leads to the continuation of school practices that they [investigators] deplore” such as “management and order or support of social class structures” (p. 521). Additionally, they argue that, “those who study the process are seen as investigating the undesirable effects of the workplace” (p. 521). Additionally, they argue that the portrayal of “the novice as a passive agent molded by outside influences” portrays “the teacher powerless”. Describing the potential for the field, however, they argue that this research area might be perceived more positively, if “an exemplary group of teachers” were studied suggesting the potential of research findings around “ ‘successful’ schools…where the norms of collegiality and experimentation prevail” (p. 521).

Zeichner and Gore (1990), however, frame the research around teacher socialization slightly differently than Feiman-Nemser and Floden (1990). They describe three different paradigms of research around teacher socialization: a functionalist approach, an interpretive approach, and a critical approach. Acknowledging that a central critique of both the functionalist and interpretive approaches for framing teacher socialization research is on their tendency to frame the process as reproduction of existing cultures the argue for the potential of the critical approach, which acknowledges individual agency and also issues of power as a part of the analytic framework. Such theoretical approaches open up the potential for looking at the process of socialization as
affording opportunity for cultural production and transformation and the action of individuals within contexts. The sociocultural theoretical frameworks, I described earlier this in chapter as framing this research are aligned with this critical approach with understanding around cultural production and transformation, specifically in regard to my use of the communities of practice theoretical framework.

_Learning to teach secondary science within student teaching experiences_

While Feiman-Nemser (1983) reported that “student teaching is… the most widely studied aspect of learning to teach” (p.155). Based on searches of the research literature, this does not appear to be the case within the research of science education. In this field the science methods class and accompanying pre-practicum field experiences appear to be more frequently studied than that full-practicum experience. As a whole, Tobin and Roth describe the field of science teacher education as an emerging. (REF-AT HOME). In fact, Yager and Penick’s (1990) handbook synthesis on science education did not mention the research on the science preservice teachers’ practicum experiences, and Anderson and Mitchner (1994) noted, that in general “there is a comparatively small amount of research on preservice science teacher education” p. 28. Regarding student teaching experiences, Anderson and Mitchner reference the literature about student teaching and field experiences in general with brief descriptions of the typical science student teaching experience. Russell and Martin (2007) in their review of learning to teach science, remind us that a critical aspect in the work of teacher educators who support the process of learning to teach falls in the area of conceptual change about
science regarding the beliefs, views about science and epistemology, and science content that teachers and learner hold and use to frame their engagement in science. Attention to the issues of conceptual change are present in all of the literature on science education cited above, and continue to be prevalent themes in the current research literature on learning to teach science.

Within the field of science education, a search of the research literature from 1999 through 2009 using the keywords “secondary,” “science,” “student teach*,” “field experience,” and “practicum” identified a twenty-five research studies published in peer reviewed journals that focused on the middle school and secondary science student teaching experience within the United States. Of these studies, a few which will be discussed later in this chapter, addressed coteaching. Two studies by Luft (1999) examined the experiences of a student teacher who taught in a school context that was culturally different from her own. Three of these studies were framed using sociocultural frameworks and student teaching (Sadler, 2006), communities of practice (Friedrichsen, Munford, & Orgill, 2006), coteaching (Tobin, Roth, & Zimmermann, 2001).

The remaining studies on secondary science student teachers and their full practicum experiences did not address the process of learning to teach as situated within the full practicum setting. Instead, these research studies addressed concepts regarding the impact of teacher education instruction and innovations on secondary science preservice teachers process of learning to teach by examining the student teachers; belief structures, understanding of science concepts, and practice in full practicum settings. These studies generally are not directly relevant to this research study as they do not
investigate the learning experience embedded within the full practicum setting, nor do they interrogate the contextual role of the practicum setting in the process of learning to teach, or utilize sociocultural theories for framing the research studies.

*Coteaching as a model for learning to teach science*

*Historical background and coteaching theories*

The term coteaching is affiliated with two distinct bodies of literature (Bacharach, Heck, & Dahlberg, 2008; Martin, 2008). The common thread between these works is a focus on joint practice. However, these two bodies of literature are philosophically different in epistemology, theoretical grounding, and in regard to the goals of practice. The first body of coteaching literature predominately focuses on the work of inclusion and mainstreamed classroom teachers who teach together to better serve the needs of students in their joint classroom (Cook & Friend, 1995). The second body of coteaching literature focuses on a sociocultural process of learning to teach that involves teachers at multiple points in their careers (preservice, inservice, and also occasionally research faculty) who teach together in order to transform their practice (Roth & Tobin, 2004, 2002, 2005b; Tobin, 2006). It is the second body of coteaching literature that I utilize for this research study.

*Coteaching as a model for learning to teach*

In the late 1990s Tobin and Roth both simultaneously, but separately began using coteaching models as means for supporting learning to teach (Roth, 1998; Roth,
Masciotra, & Boyd, 1999; Tobin, 2000). Both researchers reported finding that the experience of teaching alongside other teaching professionals impacted the work of the participants in positive ways and provided a supportive context for learning about practice. After this point the two merged resources and began writing and researching about coteaching together. Together they began investigating and theorizing about how the coteaching model worked.

Early publications primarily described the coteaching model (Roth & Tobin, 2002). They reported finding that “two teachers planning, teaching, and debriefing all lessons together learned about science teaching, both in explicit and tacit ways” (Tobin & Roth, 2005, p. 315). Initial research primarily centered on what occurred within the coteaching instructional experience, and later began to encompass conversations about coteaching that occurred outside of instructional time. As it has been developed, coteaching is an approach for experienced and beginning teachers to teach together and learn about the praxis of teaching and learning through their mutual practice. Coteaching provides teachers the opportunity to learn through situated interactions by teaching collaboratively in a supportive environment. Grounded in the belief that learning to teach is a sociocultural activity (Tobin, 2005, June; Tobin & Roth, in press), coteaching views mutual participation in shared contexts and cogenerative dialogues (LaVan, 2004, 2005; LaVan & Beers, 2005) about experience as critical elements in the process of learning about and shaping practice.

The realization that all stakeholders were impacted through co-participation in the teaching events and follow-up conversations about the experience led to the development
of cogenerative dialogues. Cogenerative dialogues are particular to coteaching (Beers, 2009; LaVan, 2005; LaVan & Beers, 2005). Cogenerative dialogues are open discussions that typically occur outside of instructional time where all participants’ opinions and voice have equal value. Such conversations provide the opportunity for all stakeholders (teachers, students, and teacher educators) to reflect on their praxis (LaVan, 2005; Tobin & Roth, 2005), and are described as a "collective, dialogic generation of descriptions and explanations (theory) of the events, which lead to the formulation of new concrete action possibilities" (Tobin & Roth, 2005, p. 315). A central goal of the conversations centers on the improvement of the teaching and learning experience. Tobin’s current work in the area of coteaching continues to center around the use of cogenerative dialogues in urban settings to improve the process of teaching and learning in schools (Bayne, 2008; Emdin, 2006; Lehner, 2006).

Coteaching as a model for learning to teach has continued to be studied by Roth and Tobin (Roth & Tobin, 2005b). Several other researchers, both within the United States and internationally, have also begun to use this model (Eick, Ware, & Jones, 2004; Jones & Eick, 2007; Murphy, Beggs, & Carlisle, 2008; Murphy & Scantlebury, in press). It has predominantly been used in the field of science teacher education, but is also being implemented across whole programs of teacher education (Bacharach, Heck, & Dahlberg, 2008, in press). Below I provide an overview of the research on the coteaching model of learning to teach. Researchers have studied each of the following groups as they participated in coteaching: preservice teachers involved in early field placements, student
teachers and cooperating teachers, and beginning teachers. These groupings provide a natural organizational structure for this review of research literature.

Research literature on coteaching as an approach for learning to teach science in secondary settings.

Coteaching: Preservice teachers in early field experiences

Several teacher educators have implemented the coteaching model as an approach for learning to teach for preservice teachers involved in early field placements. Samaras and Gismondi (1998) are among the earliest researchers to utilize a model of coteaching as a means for learning to teach. They implemented the coteaching model in urban elementary school early field placements, and their study reports on the viability of this model as an approach to teacher education. Specifically, this case study reports on the perceptions of four preservice teachers and two cooperating teachers and their experience with the coteaching model. The study also discusses the implications of this sociocultural approach to student teaching. Samaras and Gismond’s theoretical framework for coteaching and their manifestation of the model are clearly aligned with Tobin and Roth, the main developers of the coteaching model, though they do not reference these authors. This is one of the two studies discussed in this review of literature that does not ground the coteaching model of learning to teach in the theoretical framework developed by Roth and Tobin.

Two groups of researchers have adapted the work of Roth and Tobin (Roth & Tobin, 2002) to develop their own models of coteaching for their preservice science
teachers. Eick and colleagues (Eick & Dias, 2005; Eick & Ware, 2005; Eick, Ware, & Williams, 2003) have integrated the coteaching model into the early field work experience accompanying a Secondary Science Methods course at Auburn University. Together they examined how preservice teachers’ thinking about practice and inquiry science have changed through work with the coteaching model (Eick & Dias, 2005); what types of knowledge develops through coteaching (Eick & Dias, 2005; Eick & Ware, 2005; Eick, Ware, & Jones, 2004); preservice teacher perceptions of the coteaching experience (Eick & Ware, 2005; Eick, Ware, & Jones, 2004); and what types of conditions optimize preservice teacher learning within the coteaching model (Eick & Ware, 2005). In Ireland, Murphy, Beggs, Carlisle, and Greenwood (Murphy & Beggs, 2005; Murphy, Beggs, Carlisle, & Greenwood, 2004) developed a model of coteaching in which preservice science specialist teachers worked in urban primary classrooms with teachers who had no prior training in inquiry science. During these early field placements, the coteachers cotaught hands-on inquiry science lessons. These authors studied the experiences of these coteaching pairs in 18 schools. Specifically they examined student perceptions about science both before and six months after the coteaching experience (Murphy, Beggs, Carlisle, & Greenwood, 2004). This student perception study was part of a larger study that examined the perceptions of all stakeholders as well as the factors that lead to successful coteaching (Murphy & Beggs, 2005).

As a whole the research on coteaching in early field experiences reports on stakeholder perceptions, factors that support successful implementation of the model, and
the potential value of utilizing the coteaching model as a means for learning to teach. While all of the studies are grounded in sociocultural theories of learning, the studies from the groups lead by Samaras, Eick and Murphy are different from the ones described in the rest of the review. Work by Samaras and Gismondi (1998) is not an adaption of the work by Roth and Tobin (Roth & Tobin, 2002), but rather it appears to have been developed by the authors as a potential method for improving their teacher education program. Furthermore, studies by Eick (Eick & Dias, 2005; Eick & Ware, 2005; Eick, Ware, & Jones, 2004; Eick, Ware, & Williams, 2003) and Murphy and Beggs (Murphy & Beggs, 2005; Murphy, Beggs, Carlisle, & Greenwood, 2004) are two of the three coteaching studies represented in this review that utilize a communities of practice framework.

_Coteaching: Teaching interns and cooperating teachers in full practicum placements_

Research at three different sites included study of the coteaching of teaching interns (student teachers) and cooperating teachers. In Australia, Rigano, Ritchie, and Bell (2005) studied the knowledge gained by a practicum student, Donna Rigano—an educational researcher who cotaught in Trisha Bell’s classroom. The primary emphasis of this paper reports on the wisdom-in-practice developed by Rigano. The paper also explores the viability of coteaching as a professional development model for elementary classroom teachers without prior experience in inquiry science. This study also utilizes a communities of practice framework as a theoretical lens for interpreting the coteaching experience.
Three studies out of the University of Delaware report on the use of the coteaching model in suburban US schools. Scantlebury (2005) addresses the role of gender in the interactions between three chemistry cooperating teachers and three chemistry interns who cotaught together over the course of the semester. She argues that gender can play a critical role in shaping the ways that coteachers interact and access capital within a coteaching setting. Gallo-Fox, Scantlebury, Wassell, and Gleason (2005) report on the implementation of the first year of coteaching at the high school site, and propose a theoretical framework of three dialectical components of coteaching: co-respect, co-responsibility, and cogenerative dialogues. Researchers argue that “when the three Cos existed in a dialectical relationship coteaching was successful and coteaching failed or weakened if any of the three were absent or became less secure” (p. 29). In a third study, Gallo-Fox and Scantlebury (2006) examine the interactions between cooperating teachers and teaching interns during coplanning sessions to study the ways in which these meetings provide potential resources for cooperating teacher learning.

City High, an practicum setting affiliated with the University of Pennsylvania, is the primary research site for work on coteaching by Roth and Tobin (Roth & Tobin, 2002; 2005b) and affiliated researchers (LaVan, 2005; Roth, Tobin, Carambo, & Dalland, 2004; Wassell, 2005; Wassell & Lavan, 2009). Using the dialectical structure/agency theoretical lens, Roth, Tobin, Carambo, and Dalland (2004) study the coteaching of a high school chemistry course over the course of a year to examine the resources available to coteachers within the interactions of classroom instruction. Work by Wassell (2005) studied the coteaching of two student teachers of physics. Her research examined the
different roles that the coteachers assumed within the classroom and how these experiences shaped their practice. Additionally, she studied the opportunity for teacher discourse within the coteaching experience. Four sites were identified: coplanning, teaching huddles, debriefing, and cogenerative dialogues. Tobin’s most recent study (2005, June) studied types of interactions that occur within a year-long study of a coteaching chemistry classroom as well as the roles assumed by various stakeholders in the learning process. Additionally, Tobin reported on themes that emerged from cogenerative dialogues between classroom students, teaching interns, cooperating teachers, and university researchers.

_Coteaching: Beginning teachers_

A number of longitudinal studies followed preservice teachers who experienced coteaching into their first year in classroom (Beers, 2005; Juck & Scantlebury, 2006; Scantlebury, Gallo-Fox, Wassell, & Juck, 2005; Wassell, 2004; Wassell & Lavan, 2009; Wassell & Stith, 2005). Two reported on findings from a longitudinal work following the first cohort of teachers from the Delaware coteaching practicum into their own classrooms as first year teachers (Scantlebury, Gallo-Fox, Wassell, & Juck, 2005). Scantlebury, Gallo-Fox, Wassell, and Juck (2005) examined how the structure/agency dialectic impacted interns’ opportunities to develop capital in their coteaching experiences and preliminary findings regarding the new teachers’ reports of their transition into the classroom. Juck and Scantlebury (2006) provides a more thorough discussion of these teachers’ experiences through their first year in the classroom and
describes the ways that these teachers were able to draw upon resources and schema developed in the undergraduate coteaching experience to support their work as first year teachers in their new settings.

Two studies from the University of Pennsylvania also look longitudinally at teaching intern coteaching experiences. In a paper analyzing two cases of beginning urban teachers, Wassell and LaVan (2009) describe the practices and strategies developed by these teachers in their practicum coteaching experience that transferred into their own urban classrooms. An auto-ethnography by Beers (2005) explores the impact of coteaching on her first four years teaching in the classroom. Beers argues that her early coteaching experiences along with continued use of coteaching and cogenerative dialogues in her classroom “has informed [her] identity as a teacher and transformed [her] practice toward one that is more effective and more culturally adaptive” (pp. 79-80).

Work by LaVan (2005) explores the effects of cogenerative dialogues, a component of coteaching, on an experienced classroom teacher who implemented cogenerative dialogues in her classroom in an attempt to address issues in her classroom. Over the course of a year, LaVan (2005) worked with Jennifer Beers to implement cogenerative dialogues with her students. These sites of rich discussion about classroom practice brought student collaborators into the conversations about the classroom and enabled all participants to reflect on practice and pedagogy. LaVan found that cogenerative dialogues “promoted a shared sense of responsibility… because they actively worked toward making structures more conducive [to] individual and collective
goals” (p. 117). As a result of these conversations, Beers was able to transform her practice and create a classroom culture that better supported the learning of her students.

**Chapter conclusion**

This research study of the nature of a cohort coteaching model fits within the frameworks of the theoretical underpinnings and overview of the literature presented within this chapter. The full practicum has been identified as a part of the process of learning to teach, which within the field of science teacher education has only been studied in a limited capacity. Furthermore, questions about the sociocultural learning experiences afforded within this part of the process of learning to teach are not well researched. While the use of coteaching as a model for learning to teach science has been expanding, it has not yet been explored in the ways utilized in this study. Not only does this study address current gaps in the research literature, but it also utilizes theoretical frameworks for studying the experience of learning to teach within full-practicum settings that have only recently begun to be applied in the field of teacher education.
CHAPTER 3: RESEARCH DESIGN

The goal of this study was to develop an understanding of what happened when eight secondary science teaching interns participated in a cohort coteaching model for their full practicum experience. This opening statement provides the central focus of the research study with a sub-question centering around the nature of the learning opportunities afforded to interns within State University’s coteaching model. This research focuses on learning within context; bringing attention to the culture of the community and the ways that knowledge is shared and collaboratively produced through community interactions. This study utilizes a methodological approach that merges complimentary sociocultural theoretical frameworks of learning and development with ethnographic approaches. Specifically, this methodology merges Rogoff’s (1995) theories of sociocultural planes of development with an expanded logic-of-inquiry research methodology (Gee & Green, 1998) to bring together multiple qualitative traditions and afford perspective into both the cultural/contextual experiences of the coteaching community of practice as well as insight into the process of learning and development within this community. For this study the unit of analysis centered on the coteaching community of practice and the groups’ activities and interactions with a focus on meaning-making.

This chapter begins with a discussion of the methodology for studying learning in context and a description of the logic-of-inquiry methodology (Gee & Green, 1998) that was used to shape this research. Next, an overview of the data collection procedures is provided. This is followed by a discussion of the methods used for data analysis. After a
description of State University’s cohort coteaching model, the study’s research participants are discussed, and issues of researcher access to the setting and researcher reflexivity are presented. The chapter concludes with a section on trustworthiness and study limitations.

**Methodology**

This study utilizes complementary theoretical frameworks and research methodologies. This methodology brings attention to the role of language and contextual resources in the process learning within cultural settings. Such a framework has “led to an increased use of methods of discourse analysis to help understand how social interaction contributes to cognitive change” (Jacob, 1992, p. 325). As Moll writes,

> Research on teaching, at least as far as the Vygotskian-inspired analysis are concerned, is moving toward a more holistic, integrated understanding of teaching. This movement is manifested not only in the units of study connecting individuals and social context but also in the understanding of how specific social practices, discourse patterns, and uses of artifacts mediate the children’s learning and development. An integrated understanding of teaching may fulfill the potential of Vygotsky’s idea to provide a unifying framework for the study of human actions, including understanding how teaching, learning, and thinking related to broader social, cultural, and historical circumstances. (p. 124)

This study is grounded in a sociocultural framework and utilizes ethnographic research perspectives (Gee & Green, 1998). Specifically, the research methodology
follows a *logic-of-inquiry* approach (Gee & Green). Gee and Green in their description of a *logic-of-inquiry* methodology make a strong argument about the importance of a “theoretically coherent research approach” (p. 121). They argue that frequently research studies fail to clearly delineate underlying theoretical frameworks that are used to shape analysis, nor are the research methodologies that are used closely tied these frameworks or described in ways that explain how or why such approaches best address the research questions. Highlighting these points they call for clarity and interconnected links between research methodology, theoretical frameworks, research questions, and analytical approaches. Specifically, they argue that within sociocultural frameworks it is appropriate to utilize ethnographic perspectives and merge them with other qualitative methodologies in a theoretically grounded way that provides a methodological approach for examining questions of learning within situated contexts and cultures. As they argue it is important to allow the analysis to follow the research questions, overarching theoretical frameworks of the study, and also reflect the means most appropriate for the varied data collected to inform the research. Such approaches need to be done under “a coherent… understanding of the sociocultural nature of discourse, social practice, and learning” (p. 121). As they write,

> We argue that what is needed is a set of approaches that cohere in theoretically oriented ways, and not a consistent set of methods, giving the range and type of data collected within an ethnographic study or studies guided by ethnographic perspectives. What remains consistent in this approach is the theoretical perspective and approach that guides selection and analysis of particular methods.
of analysis. This approach allows us to be responsive to the type of data being analyzed and the questions being examined. (p. 161)

In keeping with a *logic-of-inquiry* methodology, a number of qualitative approaches of analysis where utilized to strengthen understanding of the coteaching experience and the learning and development that occurred within the coteaching community of practice. Specifically, three different analytic approaches were utilized. These include: general qualitative and ethnographic approaches, cross-case analysis (Miles & Huberman, 1994), blending of discourse analysis and ethnographic methods with a focus on the process of meaning making. Methods of analysis are further described after the discussion of data collection procedures and data sources that were used to inform this study.

**Overview of data collection procedures and data sources**

Data collection occurred over a period of seven months from December 2004 - June 2005, with field observations occurring during the four months that the interns were working in the schools, February 2005-May 2005. Data collected are representative of traditional types of ethnographic data sources (Atkinson, Coffey, Delamont, Lofland, & Lofland, 2001; Hammersley & Atkinson, 1983) and include interviews, observational field notes, recordings of situated interactions, and classroom documents represent typical ethnographic data.

Table 3.1 provides an overview of the data collected that were used to inform this study. Organized by data source, this table depicts the type of data, the research
participants, and amount of data collected. The section that follows provides an overview of the data collection process. Subsequently, each type of data source is discussed.

Table 3.1. *Overview of data sources*

<table>
<thead>
<tr>
<th>Participants</th>
<th>Data Source</th>
<th>Frequency</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eight teaching interns and eight cooperating teachers</td>
<td><strong>Interviews</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Intern</td>
<td>Three formal interviews with an average of 3.5 hours per intern</td>
<td>Twenty-eight hours of intern interviews</td>
<td></td>
</tr>
<tr>
<td>• Cooperating teacher</td>
<td>Two formal interviews about one hour each</td>
<td>Sixteen hours of cooperating teacher interviews</td>
<td></td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fieldnotes</td>
<td>Each intern was observed at least 20 times over fifteen weeks</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Recordings of meetings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Coplanning sessions</td>
<td>A minimum of two per participant</td>
<td>Twenty coplanning sessions</td>
<td></td>
</tr>
<tr>
<td>• Seminars</td>
<td>Five seminars located at BHS attended by interns and cooperating teachers</td>
<td>Five seminars</td>
<td></td>
</tr>
<tr>
<td><strong>Program Documentation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Fall methods course syllabus, intern reflective journal entries, weekly schedules and lesson plans, miscellaneous instructional materials</td>
<td></td>
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</tbody>
</table>

Generally, ethnographers begin with a broad research question that is explored during the initial phase of data collection. This becomes more focused as researchers develop a clearer understanding of the community and its culture (Carspecken, 1996; Carspecken & Apple, 1992; Spindler & Spindler, 1992; Thomas, 1993). Data collection is a reflexive
and recursive process in which theory and practice inform one another as the research process unfolds. Hammersley and Akinson (1983) provide numerous reasons why research questions evolve once the ethnographer is in the field, and Spindler and Spindler write that, “As a rule, the specific problem, with related hypotheses, is developed as the fieldwork proceeds” (p. 68). I collected data for this study as a part of a larger evaluative study of the implementation of a mid-Atlantic State University’s Undergraduate Secondary Science Program coteaching model. While the overarching questions of the larger study guided the data collection process, my work at Biden High School was also guided by a desire to understand the experiences of the teaching interns within that coteaching community of practice. Over time, however the research question for this study evolved, became more focused, and brought my attention to the opportunities for learning located that are within the culture of the community of practice and situated interactions. As a result, the data collection process became more focused over time. I describe the process as consisting of two different phases of fieldwork. These are described in the sections that follow. Data collection first began with intern interviews following the end of their Secondary Science Methods Course, but prior to the beginning of coteaching. Data collection in the field was ongoing throughout the interns’ coteaching placements at Biden High, which began on February 7, 2005, and is described, in further detail below.

**Fieldwork: Phase I**

Field observations were conducted in two different phases. *Phase I* began when the interns began coteaching at Biden High in early February and lasted through the first
week of April. Initially, data were collected around broad questions of the nature of the coteaching experience and the interns learning experience within the larger umbrella of an implementation study on the coteaching model. During this phase of data collection, my goal was to gain an understanding each intern’s instructional experiences by observing each of their instructional coteaching configurations. I observed each of the eight interns working with different coteachers, and I also observed at least one coplanning session for each group of teachers. Specific classes were chosen for observation based upon the following research goals: to observe cotaught lessons, to observe as many of the participants as possible, and to gain insight into the interns’ integration into the classroom. Classes in which tests, quizzes, and movies were scheduled were generally avoided. Instead, classes were selected where active instruction was scheduled to occur. While I typically arrived at the school with a tentative observation schedule, this was often subject to change due to situations in the field and input from research participants. During this phase, I relied heavily on field notes for documenting on-site observations. During coplanning observations, I sat with the coteachers and took field notes while also recording the session with a micro-cassette recorder placed in the middle of the table. On-sight seminar meetings were attended by both interns and cooperating teachers and were also recorded. Fieldnotes were written about all coplanning and seminar meetings; these were also later transcribed.

The combination of field observations, a second round of interviews, and informal conversations with research participants during Phase I led me to the realization that instruction over the course of a day was informed by both coplanning sessions and on-
going interactions throughout the course of a teaching day. Phase I observations illuminated the fact that coteachers “conferred” many times throughout the course of coteaching together (before, during, and post instruction). Through my time in the field, I realized that following an individual participant over the course of a single day could potentially provide valuable insight about how their coteaching evolved throughout the course of a day and also about the role of ongoing coteacher interactions throughout the day. Additionally, I was finding that my location in the back of the classroom often made it difficult for me to listen in on the “teacher talk.” I was becoming increasingly curious about coteaching conversations and I began asking questions about how these dialogues informed practice. Insight from the first phase of data collection led to a marked shift in focus and approaches to data collection for the next phase in data collection.

Fieldwork: Phase II

Phase II of data collection began in mid-April. These observations were distinctly different from Phase I in that my goal was to gain insight into the typical day of each intern’s teaching experience. Each intern was followed for two instructional days. I typically arrived during period 1 and shadowed them throughout the day. Thus, I attended prep periods, lunch and after-school meetings as well as all instructional periods. Research participants voluntarily wore a digital recording device throughout the day so that coteaching conversations could be recorded. Additionally we typically met for about twenty minutes in the afternoon to discuss the day’s events. These open-ended conversations about the day (Fontana & Frey, 2005; Hammersley & Atkinson, 1983), typically encompassed reflections on instruction, progress, and work with coteachers.
While I spent each day shadowing one particular intern, my interactions were not limited to one individual. Each intern worked with multiple coteachers daily. While not my central focus, I also observed and spoke with those teachers and other coteachers as needed and when physically possible during my time on-site. Finally, I also attended other coplanning meetings if they occurred after the intern that I was shadowing had finished their day at Biden High.

Throughout my time in the field, I tried to maintain a balance regarding the time spent with each intern and the types of activities that I observed. I used a spreadsheet to keep track of contact hours with each research participant. While every effort was made to spend equal amounts of time with each intern, due to circumstances in the field I was able to observe some interns more frequently than others. Contact time with individual interns ranged from thirty-one contact hours to forty-five contact hours. This time includes three and a half hours of interviews, fifteen hours of coteaching seminars, and twelve and half to twenty-six hours of observation at Biden High.

Finally, throughout the study I maintained a daily Project Log that contained organizational notes, copies of all email communication related to the project or with participants, and memos regarding the ongoing progress of the study.

Data sources

2 For example there was a coplanning group that was having difficulties that I frequently attended. Scheduling issues such as illness, absence due to job hunt or family circumstances also impacted observations. Finally, some interns cotaught different classes with two interns over the course of the day while others only cotaught one class. Because of this I observed some of the participants more frequently than others due to the nature of their schedules.
As has been discussed, four different types of data sources were used to inform this study. These sources include interviews, observations, recordings of meetings, and program documents. Each of these sources is described below.

**Interviews**

Interviews provide a rich opportunity for gaining access to an emic perspective. Based on the assumption that participants’ perceptions about coteaching could change as their involvement within the model increased, interviews were conducted as part of the implementation study prior to the beginning of coteaching, five weeks after coteaching began, and as a close-out interview after coteaching was completed. Each interview had a slightly different focus to reflect participants’ experiences in the field and emergent understandings of practice. The purpose of the first interview was to gain an understanding of their science methods course experiences, views about teaching, and initial perceptions about coteaching. Additionally, this was my first opportunity to meet with the interns individually and an initial opportunity to build a personal rapport. The second interview occurred five weeks after the interns began coteaching. The main goal of this interview was to develop an understanding of the interns’ integration into the community of practice and to gain an understanding of their current perceptions of the experience. The final interview occurred after the coteaching experience was concluded and sought to gain participant perspective about the experience.

Interviews were conducted using a combination of semi-structured and open-ended interviewing techniques (Carspecken, 1996; Foley & Valenzuela, 2005; Fontana & Frey, 1994; Hammersley & Atkinson, 1983). The interviews were viewed as
collaborative efforts (Fontana & Frey, 2005; Weiss, 1994) and structured as free flowing conversations with the goal of addressing the different topics identified in the protocol. While general questions were drawn up in the form of an interview protocol, these were used as loose guidelines and as a list of points that I hoped would be addressed. Interviews were also used for theoretical sampling and to clarify observations from the field. At times the protocol were referred to, but the flow of the interview conversations were predominantly directed by the participants. Each of the interview protocols is located in Appendix A.

In total each of the teaching interns was interviewed for about three and a half hours. The first interview generally lasted about forty-five minutes. The second interview averaged one hour and twenty minutes, and the close out interview lasted approximately one hour and thirty minutes. Cooperating teachers were interviewed twice: five weeks into the coteaching experience and again at the end of the coteaching experience. Each of the cooperating teacher interviews averaged one hour.

Field observations

Field observation and writing of fieldnotes are a central component of ethnographic fieldwork. Data collected during field observations are comprised of field notes from observations of coteaching and solo teaching experiences, observations of coplanning sessions, prep periods, lunch, and program seminars. During observations of classroom instruction, I typically sat in the back of the classroom at a lab bench while taking notes and video taping instruction. The interns’ actions and interactions were the focus of my observations. In contrast, during coplanning sessions, seminars, and lunch
periods I typically joined the coteachers sitting at a classroom table and focused my attention on group interactions. My fieldnotes are descriptive, analytical and methodological (Emerson, Fretz, & Shaw, 2001). They contain description of interactions, setting, resources, as well as my own analytical hunches, on-going research questions, and thoughts about additional data collection and issues of positionality.

Recordings of meetings

Spindler and Spindler argue that by recording activities in classrooms, a researcher is able to capture “a more complete record of those activities” (Spindler & Spindler, 1992, p. 78). They write that recordings can provide an opportunity for researchers to “‘return’ to the classroom… [in order to examine] particulars with close attention” (p. 78); they can also be used to “bring the data to life” (p. 78) and for “reexamin[ing] new hypotheses and new theoretical orientations” (p. 79). Little (2002; 2003) in her papers proposing a theoretical analytical framework for studying teacher learning in the context of everyday work writes, “these records show with needed specificity what is available for consideration [in regard to teacher learning] by way of talk and material artifacts” (Little, 2003, p. 938). By working with recordings of teacher interactions, researchers gain access to the ways that teachers afford opportunities to learn within their professional community. Additionally, “records that preserve the flow of interaction show how teachers coconstruct representations of practice… [and show] how opportunities to learn and participate are also collectively shaped, coconstructed and distributed” (Little, 2003, p. 939). Transcriptions of situated interactions provide a
valuable resource for researchers working to understand how opportunities for learning are socioculturally constructed in practice.

Specific recordings of coteacher interactions that are used to inform this research include coteacher coplanning sessions and on-site seminars, which were attended by both interns and cooperating teachers.

Documents

“The good ethnographer is also a good collector of artifacts, products, documents—anything that can be conceivably related to the object of study” (Spindler & Spindler, 1992, p. 67). These authors explain that while the immediate value of documents and artifacts may not be known, their importance often becomes realized during data analysis. Additionally, as both they and Valenzuela (1999) remark, most of the supporting documents never make their way into the final pages of a study, rather they are used to inform and support analysis and findings.

Numerous documents all connected to the implementation of the model and coteaching practice were collected throughout the study. These represent a wide range of materials and include weekly intern teaching schedules, lesson plans, and journal entries that were submitted electronically. Additional classroom teaching documents include classroom handouts, assignments, and lab protocols. These were collected while in the field observing coteaching or during coplanning sessions and were offered to me by the research participants. These document materials served as secondary data sources and were primarily used as reference and for fact checking.
Methods of Data Analysis

Analytic approaches used in this study are informed by the work of three different sociocultural researchers and theorists. First, Rogoff’s work provided an analytic lens for examining particular aspects of the sociocultural learning experience. Secondly, Gee and Green’s (1998) work around logic-of-inquiry provided a methodological approach for merging various qualitative methods with ethnographic approaches in a theoretical and socioculturally appropriate way. The central understandings of these works are described below and followed by discussion about how they were utilized together in the analytic process for this study.

Rogoff’s framework for sociocultural analysis of development: Studying planes of development

Rogoff provides a framework for examining sociocultural learning experiences (Rogoff, 1995; Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995). She argues that learning occurs on multiple levels that she identifies as the community plane, the interpersonal plane, and the personal plane. While learning occurs concurrently in each of these areas, examining them collectively becomes difficult due to the complexity of the experience. Rogoff argues for an analytic approach that foregrounds one plane of learning at a time while still acknowledging the “mutually constituting” (1995, p. 144) nature of the planes. She writes, “individuals’ efforts and sociocultural institutions and practices are constituted by and constitute each other and thus cannot be defined independently of each other or studied in isolation” (Rogoff, Baker-Sennett, Lacasa, &
Goldsmith, 1995, p. 45). By choosing to focus at a particular level, researchers can foreground a particular aspect of the situated learning experience. Rogoff argues that when studying development through a sociocultural framework one can analyze the experience across three different planes: community, interpersonal, or personal. Each of these planes provides a particular lens for analyzing the participant experiences within the larger community experience. Planar analysis does not ignore occurrences within other planes, but actually incorporates them to contextualize and further inform understanding. As Rogoff et al (1995) write, “From the perspective that development occurs through participation, it follows that personal, interpersonal, and cultural processes all constitute each other and develop in sociocultural activity” (p. 56).

For this dissertation, the emphasis is on the collective process of learning to teach within a community of practice. Therefore analysis centers on the community and interpersonal planes. In keeping with Rogoff’s theoretical framework, the individual plane is acknowledged, but not emphasized in this document due to the already large scope of the analysis presented here.

**Analysis of development on the community/institutional plane**

The community plane of analysis focuses on people participating with others in culturally organized activity with institutional practices and development extending from historical events into the present, guided by cultural values and goals (Rogoff, et al., 1995, p. 46).
Central to analysis of the community plane is recognition of the “mutual embeddedness of the individual and the sociocultural world” (Rogoff, 1995, p. 143). Understanding development at the level of community requires a dual understanding of two interrelated processes: how the community develops as a cultural organization, and how cultural practices are utilized within the community. Analysis at the community plane focuses on the ways that traditional practices of the community are passed along and shaped as group members utilize these practices in their ongoing work. The development of individuals at the community level is interpreted as apprenticeship, wherein newcomers participate in community cultural practices and come to participate in ways that are aligned with more experienced community members. Finally, understanding development at a community level requires recognition that practices are not static. The culture of a community can change, as can the ways that the collective conceptualizes their work and their roles. For the purpose of this study, analysis of this plane emphasizes the participation of the interns and cooperating teachers in the cultural practices of the coteaching community.

Analysis of development on the interpersonal plane

The interpersonal plane focuses on “the processes and systems of involvement between people as they communicate and coordinate efforts while participating in culturally valued activity” (Rogoff, 1995, p. 142). Such interactions may include those that were “meant to instruct,” and also those that were “simply available” through participating in a context with others. Interpersonal processes are described broadly and
include direct engagement or “observation” in “face-to-face” or “side-by-side joint participation,” or even in “more distal arrangements that do not require copresence” (p. 142). Furthermore, interactions occur in multiple configurations, including those in which people work independently and draw on a community’s cultural practices or previous experience with others. For example, a “distal arrangement” could include the coteachers’ “solo” instructional period when they teach independently, but draw on collectively constructed plans and the cultural norms and practices of their micro-community. As Rogoff explains, interpersonal interactions are guided by the “cultural and social values” (p. 142) of a context as well as interactions with other participants with whom learners may or may not have symmetrical relationships. Rogoff (1995) further explains, “these collective endeavors constitute and transform cultural practices with each successive generation” (p. 147). Developing understanding into the interpersonal interactions enables researchers opportunity to understand how participants shape and reshape their culture and provide opportunities to change future practice. Analysis at the interpersonal level seeks to understand development as participants interact with others and the culture of the community as they “communicate and coordinate” their actions. This analysis looks at the processes of participation as well as the ways that interpersonal interactions support and restrict participation.

Analysis of development on the personal plane

Rogoff (1995) writes that the focus of analysis at the personal level centers on “how individuals change” (p. 142) as they participate in the cultural activities of a community. She describes this as a process of participatory appropriation, this is “the
personal process by which, through engagement in an activity, individuals change and handle a later situation in ways prepared by their own participation in the previous situation” (p. 142). She describes this development as a dynamic process of “becoming,” and describes the learning that occurs as a dynamic appropriation of culture, not a process of knowledge acquisition or internalization. Other theorists have also written about individual development within sociocultural contexts. Like Rogoff, Lave and Wenger (Lave, 1993, 1996; Lave & Wenger, 1991; Wenger, 1998) and Gee (1992, 1996) also describe this as a process of developing membership and a process of “becoming,” or “identity development.” Due to the extensive length of the existing study, specific analysis around the intern’s personal development and their developing sense of identity as a high school science teacher are not specifically addressed in this dissertation. However, they are described here as individual development of cultural Discourse and issues of membership are discussed in the findings of this study. Specific analyses on the level of the personal plane, however have been saved for future writing and publication projects.

Rogoff’s approach to studying sociocultural learning experiences provide an approach for delving into the multiple layers of learning that occur within a learning community and provide a vehicle for interpreting the experiences of the secondary science interns who participated in the coteaching community of practice at Biden High School. Her framework provides the organizational structure for this dissertation. The first two findings chapters focus on community level experiences within the coteaching community of practice. These chapters delineate how the coteaching community of
practice was organized and supported learning within the cultural practices of the community. The last two findings chapters are situated around the interpersonal process and explore the interactions of a small group of coteachers as they developed instruction and moved their plans into practice. Specifically these chapters focus on the ways that group member interactions afforded participants with opportunities for thinking and learning about practice.

*Logic-of-inquiry analyses*

As discussed in the beginning of this chapter, analytical approaches for this study are in keeping with *logic-of-inquiry* research methodology (Gee & Green, 1998), which argues that in studying sociocultural learning within community researchers must draw on the different traditions of ethnography and discourse analysis in theoretically appropriate ways. Rogoff’s work around the planar analysis of development strongly informs my research analysis, because types of analyses were better suited for examining the participants’ experiences across different planes. As Gee and Green write,

> As members interact across time and events, they are continually defining and redefining what counts as community through the norms and expectations, roles and relationships, and rights and obligations constructed. Within such communities of practice, individual members are afforded access to particular events and spaces; thus, they have particular opportunities for learning and for acquiring the social and cultural processes and practices of group membership. (p. 148)
The key concern was to be able tease apart the ways that participants where participating within this coteaching community of practice in order to begin to understand what types of opportunities existed within the many contexts for participation. Initial analyses of the data were done a broad level drawing on general qualitative and ethnographic approaches. Then beginning at the level of community analysis first examined the community-wide practices of the coteaching community of practice. Next, acknowledgement of the contextual differences between disciplinary sub-groups of coteachers, what I call *micro-communities*, are examined through a cross-case comparison (Miles & Huberman, 1994). Finally, research moved to the interpersonal plane of development through analysis of a three coteachers’ interactions around the development and implementation of instruction. Such analysis begins with a broad lens into the experiences of the whole community and then zooms to more focused levels of analyses. Figure 3.1 illustrates the relationship between Rogoff’s theories of development on community and interpersonal planes and the analytical approaches used at each level of analysis.

<table>
<thead>
<tr>
<th>Initial multi-planer analysis of the data: Ethnographic methods</th>
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<tbody>
<tr>
<td>Community plane of development</td>
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<tr>
<td>Analysis at the broad community plane: Ethnographic methods</td>
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<tr>
<td>Analysis across a group of inter-related micro-communities:</td>
</tr>
<tr>
<td>Cross-case comparisons</td>
</tr>
<tr>
<td>Interpersonal plane of development</td>
</tr>
<tr>
<td>Analysis of interactions between one micro-community of three coteachers: Discourse analysis and ethnographic methods</td>
</tr>
</tbody>
</table>

*Figure 3.1.* Multi-layered analysis zoomed in on increasingly narrower planes of development using differing analytic methods
Specifics about the three different analytic approaches utilized are described below. These three analytic approaches include: general qualitative and ethnographic approaches, cross-case study analysis, blending of discourse analysis and ethnographic methods.

**General qualitative and ethnographic approaches**

Analysis of the data set as a whole began with initial multiple readings of the data. Data were organized chronologically, by micro-community, and by data source. Each of these readings helped reveal different aspects of the experience. The chronological reading helped to show the evolution of the coteaching community of practice and changes in behavior and cultural practices over time. Micro-community readings emphasized the role of context in the learning experience, as these data illuminated the large differences in the ways that different groups of participants cotaught together, formed their roles for practice, and shaped their work together. Finally, reading the data by data source emphasized the different types of practices and conversations that occurred within different settings, for example, the ways that people behaved when coteaching and solo teaching, versus the types of conversations that occurred during coplanning and seminar meetings. During these multiple reads of the data I began the process of open-ended coding, noting big ideas and themes that were present in the data. During this process I began to write analytical memos about the patterns that I was seeing and developing theoretical ideas about the coteaching experience. After this I used HyperResearch ® to continue to code the data by using the software to label the data by
code. At this point I both labeled data as per the codes in my hand-written notes and also as part of an on-going iterative process in which I continued to analyze the data based on the patterns that were emerging. Finally, I used the memoing feature of the software extensively, to link my analytical thinking and interpretations of the data directly to the coded data chunks. This was an iterative and recursive process informed by both what I was seeing in the data and also my understanding of situated learning as developed by Lave and Wenger (1991), from this point forward analysis continued to be informed by on-going readings of the literature. Data analysis occurs through searching the data for emergent patterns and themes. Part of the process of interpreting the data included thinking about patterns of coherence as well as contradictions within the data to interpret (Sewell, 1999) the participant experiences.

A wide range of codes and themes emerged from the coding process, many of these codes contained data spanning each of the three developmental planes as described by Rogoff. While such findings are in keeping with Rogoff’s arguments about learning within community, they can create difficulties for researchers in terms of the complexity of the data and needing to determine the clearest way to describe findings. Beginning at the level of community, I selected all of the coded data around the various types of practices that the coteaching participants engaged in each instructional day and began by creating a community level description of the experience of coteaching at Biden High School.

Cross-case analysis
After this I remained at the community level of analysis, but instead of examining the experience across the broader coteaching community of practice, I moved to the level of specific micro-communities to delve into the ways that these groups interpreted and enacted coteaching within their smaller community level contexts. Interns all worked within more than one micro-community. Each of these micro-communities were defined be specific participants who coplanned and cotaught specific courses together, and developed contextually specific ways of practicing. These micro-communities fit Miles and Huberman’s (1994) definition of “a case as a phenomenon of some sort occurring in a bounded context” (p. 25). These authors argue that “multiple cases offer the researcher an even deeper understanding of the processes and outcomes of cases,” (p. 25) therefore, drawing on approaches from cross-case comparative analysis (Miles & Huberman) I selected an intersecting group of three micro-communities that four interns moved between to highlight the marked differences between the experiences of these four interns according to setting. Micro-communities were first interpreted as separate entities around issues of group dynamics, framing of participant roles, and curriculum and pedagogy. Descriptions of each case were written to describe the contextual experience within each micro-community. Then the cases were compared to help illuminate the differences among the groups. From here I moved to the plane of interpersonal development to study the ways that specific interpersonal interactions played a role in shaping the participation structures and coteaching processes of one specific micro-community. For this analysis ethnographic methods were merged with those from discourse analysis with an emphasis on semiotics, or meaning making. That analytic process is described below.
Blended discourse analysis and ethnographic methods

Fine-grained analysis of interaction data enables researchers to understand how aspects of practice become publicly shared and negotiated within a professional learning community (Little, 2003). The merging of discourse analysis and ethnographic approaches enabled analysis of the collective process by which participants made sense of practice within the development and implementation of a specific lesson about muscle anatomy. As I read through the entire data set on the initial multiple readings of the data, it became apparent that the coteachers’ practice was layered and intercontextual (Floriani 93, Bloome & Egan-Roberston 93). However, as I thought about the codes, themes and the central arguments emerging from my work I was finding that the intertextuality (Bloome & Engan-Robertson, 1993; Lemke, 1992) and intercontextuality of practice across sources and time was becoming lost in the decontextualized data chunks. I felt it important to identify these intertextual layers and compile them so that I could work with cohesive data sets. Using HyperResearch ® to code my data I used the “Flow” code to identify/mark intertextual layers of practice evident in the larger data set. Every time I located an ongoing thread of practice (across time and data source) I coded this large data chunk. This way I was able to compile many threads of practice across each of the coteaching micro-communities. These threads often carried across context and were found winding across data sources (coteacher meetings, lunches, weekly seminars, and in classroom practice) and carried across micro-community through the coteacher networks. What was represented in each thread and how fully each thread was developed in the data set reflected, in part, my contact hours with different coteaching community members at
any point in time and also my emphasis of data collection during the time of each lesson development and implementation. Working through the data report I began to compile the more comprehensive threads of practice.

Gee and Green (1998) describe slice of life analyses as focusing on intertextual data sets that look across time and space to:

include [analysis of] the moment-by-moment, bit-by-bit construction of texts (oral and written), the chains of concerted actions among members, and the role of prior and future texts in connecting these “bits of life,” and what members take from one context to use in another (p. 149).

Such analyses enable one to analyze how people learn in social contexts as they engage in the following social dimensions: world building, activity building, identity building, and connection building (Gee and Green, 1998). These analyses are grounded in sociocultural theories of learning and development situated within communities of practice. Gee and Green (1998) identify the data sets constructed around these theoretical understandings and methodology as a slice of life. Part of the power of the slice of life terminology is the way that the language provides a sense of the way that the data is carved out of the larger experience and also slices across time and space.

The slice of life data set selected for the analysis found in Chapters 6 and 7 contained a broad range of data spanning February through June, 2005 and incorporated data from each of the types collected (coplanning meeting transcript, observations across the day: classroom instruction, lunch, time between the bells, intern and cooperating teacher interviews, and seminar transcripts). There were several other reasons for
selecting this particular data set from the many that had been created. The interactions studied were from a strong cohesive group (Siskin, 1994) that created a dynamic learning community while working together. While not all groups in the larger coteaching community were as tightly bound (Siskin, 1994), this data set provides many rich examples of the ways that successful groups worked together within the coteaching model. As such, analysis of these data illuminate the ways that coteachers negotiated their plans in practice and enables rich understanding about how these coteachers afforded each other with many opportunities to consider and learn about practice as they worked together to develop and implement instruction. These data provide a rich site for examining the ways that cohesively bound coteaching micro-communities afford learning through their interactions. Collectively this slice of life data set provides a rich site for examining the ways that coteaching micro-communities afforded learning opportunities through their interactions.

Once the slice of life data set was compiled and selected from the other available longitudinal “slices,” initial analysis began through the construction of trajectories of practice. Looking across a trajectory of practice provides a unique way to explore how practice is socially constructed and developed within specific contexts. My use of the concept of trajectories of practice builds on Little’s (2002, 2003) work on trajectories of learning and development which builds on works by Lave and Wenger (Lave, 1996; Lave & Wenger, 1991; Wenger, 1998). Wenger (1998) writes,

In using the term “trajectory” I do not want to imply a fixed course of a fixed destination. To me, the term trajectory suggests not a path that can be foreseen or
charted but a continuous motion – one that has a momentum of its own in addition to a field of influences. It has a coherence through time that connects the past, the present, and the future. (p. 154)

Like Wenger, I do not view trajectories of practice as predetermined or moving along a specified plane. Rather, I consider trajectories to be a series of interrelated interactions that are intertextually and intercontextually related. These related and layered experiences connect across time and space can be examined collectively to understand how teachers interact and afford opportunities for learning in the ongoing work of coteaching. In reality, these trajectories and slices do not exist. They are constructs developed by researchers as means for studying experience and to illustrate shifts in practice over time and space. The constructs illustrate the dynamic developments that participants collectively negotiated in their on-going practice. The slice of life data compilations and analysis of the experiences contained within them provides a venue for understanding the development of practice and affordance of learning during these interrelated episodes.

I began analysis of the data set by breaking the transcript and field note data into episodic chunks. Episodes were identified by topical shifts in conversations and/or purpose of discussion (Horn, 2002). Following Little’s (2002, 2003) example I began constructing tables to illustrate trajectories of practice found within the slice of life data set. The purpose for constructing the trajectories of practice was to delineate shifts in practice and on-going meaning-making process (semiotics) that occurred as the coteachers collectively constructed their practice. Different tables emphasized different
aspects of the teachers’ ongoing practice that appeared to be integral to their on-going negotiations.

As I looked across the episodes it became clear that as the coteachers coplanned they considered multiple iterations of practice that were frequently renegotiated. The trajectories of practice analyses illuminated the many possibilities that the coteachers imagined for their work and drew attention to the multiple shifts that occurred.

*Line-by-Line Analysis of Episodes*

Once the references [data] are identified, it is possible to reenter the data and examine each of these moments in time to identify the social process and practices that were constructed, the meanings that were developed, and what counted as appropriate actions and knowledge within each event or point in time reference (Gee and Green, 1998, p. 137).

After the coplanning transcript and fieldnote data were divided episodically and the trajectories of practice were constructed, I began to look within each construction of meaning (conceptualization of the plans) to understand what was occurring within these chunks and how the coteachers were collectively constructing new meaning for practice. An element of this approach was to analyze data for the ways it showed affordances for learning without assuming that learning necessarily resulted (Little, 2002). Codes began to emerge that were topical and related to aspects of practice; demonstrated skills and knowledge of practice, or related to group dynamics, and also those connected to specific types of action or processes.
Coding was conducted using the qualitative research software HyperResearch ®. This software appears to be better suited to support analysis utilizing qualitative traditions such as grounded theory or ethnography which requires chunking data by codes or themes. It is not suited for discourse analysis. It was particularly mismatched to my analytic goals as my central needs were not to code the day by topic, but rather to examine and develop an understanding of the interpersonal processes and on-going co-constructions of practice that were present within the data. This was the software that I had available however, and I needed a way to work through the data and attach my on-going interpretations of the coteachers’ exchanges to particular chunks of data. The annotated memoing feature became an essential tool to support my needs and facilitated my ability to attach analytic understandings to the data as I worked through the data line-by-line approach to interpret what was occurring. These annotated memos were the sites where I recorded multiple possible interpretations for what was occurring in the data, and also where I drew connections between the data, group dynamics, and processes evident in the data. These memos and the understanding that I constructed through writing them were instrumental in developing understanding around the ways that participants were working to construct their practice and affording opportunities for learning within the context.

Although my initial coding included topical codes, when I moved to the writing stage I focused my analysis further by specifically focusing on themes relating to interpersonal processes. Generally, findings about these processes emerged from the data. An exception to this was the conversational practice, “rehearsals” which originated from
the research literature (Horn, 2005). The flow chart that follows presents a graphic of the research process for this analytic process (See figure 3.2).

Flow chart: The research process for analyzing for learning affordances

**Primary analysis of ethnographic data set**
(Develop organizational code “FLOW” to identify any on-going developments (threads of practice) in the larger ethnographic data set. Code these threads as part of the ongoing coding process.)

**Secondary analysis for learning affordances through interpersonal processes**
Using “FLOW” code reports compile multiple data “flows” intertextuality across the study data set

Select Anatomy and Physiology Sarcomere practice *slice of life* data set

Using slice of life data set
Break transcript and field note data into episodes

Develop trajectories of practice charts

Line-by-line analysis: Code data by process and topic with detailed memo writing about interpersonal processes

Re-constitute the data around processes of interpersonal meaning-making and collective construction of practice

On-going reading in literature iterative process as part of analysis and writing

Figure 3.2. Flow chart of research methods for secondary analysis: Analyzing for learning affordances

**State University’s undergraduate secondary science education program**

State University’s Undergraduate Secondary Science Education Program is accredited by NCATE and located in the University’s College of Arts and Sciences. At this University all undergraduate secondary teacher education programs are located outside of the School of Education and situated within the content areas. Preservice teachers in this program specialize a specific science content area: Biological Science
Education, Chemistry Science Education, Earth Science Education, or Physics Education. Advising for the majors occurs within the particular science departments where the majors are located. Dependant upon the specific content major, each of the students completes 30-43 credits within their science discipline and also 23-34 credits in the other science disciplines (biology, chemistry, geology, physics) and mathematics (including Calculus). The major provides students with a solid background in the science discipline that they wish to teach and also an introduction to the other sciences. These undergraduates take a total of 24 education credits, 9 of which are student teaching full practicum completed in the spring of their senior year. Additionally, students must fulfill the college and university core requirements (State University Course Catalog, 2004-2005; Program website). See Table 3.2 for more specific information about the different majors.

By the time the preservice teachers began their full practicum they had all completed upper level course work in their science majors, taken experimental laboratory classes in their disciplines and most majors were required laboratory classes in other disciplines. Additionally, of the participants some had been undergraduate researchers in University science faculty research laboratories, others had been teaching assistants for undergraduate lab courses, and one participant had held a teaching/research internship at the Smithsonian National Air and Space Museum, Washington, D.C. during the summer before his senior year (Field notes; Intern Interviews). As a result of these background disciplinary experiences, the preservice teachers were viewed as science content

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3 This major was located in the geology department; these interns identified themselves as geologists.
specialists by both the program director, the cooperating teachers, and the interns themselves (Fieldnotes, Interviews).

Table 3.2. *Overview of Science and Education Credit Requirements for Secondary Education Majors*

<table>
<thead>
<tr>
<th>Major; Degree</th>
<th>Credits in science specialty</th>
<th>Credits in other science disciplines and math</th>
<th>Credits in education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Science Education; B. A.</td>
<td>33 credits in Biology</td>
<td>16 Chemistry and Biochemistry; 7-8 Geology; 8 Physics; 3-4 Math</td>
<td>15 credits + 9 credit full practicum</td>
</tr>
<tr>
<td>Chemistry Science Education; B. A.</td>
<td>42-43 credits in Chemistry and Biochemistry</td>
<td>4 Biology; 4 Geology; 8 Physics; 8 Math</td>
<td>15 credits + 9 credit full practicum</td>
</tr>
<tr>
<td>Earth Science Education; B. A.</td>
<td>32 credits in Geology and Climatology</td>
<td>3 Biology; 4 Chemistry; 3 Marine Studies; 12 Physics; 3 Math</td>
<td>15 credits + 9 credit full practicum</td>
</tr>
<tr>
<td>Physics Education</td>
<td>30 credits in Physics</td>
<td>8 Chemistry; 15 Math</td>
<td>15 credits + 9 credit full practicum</td>
</tr>
</tbody>
</table>

Unless they shared a common major, many of these preservice teachers had not taken courses together prior to the Secondary Science Methods course, Teaching Science in Secondary Schools, which was taken the semester before the full practicum. This course was cotauft by the secondary science teacher education program administrator and Biden High School’s science department chair. During the fall science methods course the preservice teachers were exposed to the theories of coteaching through literature readings and discussion. They also were assigned a coteaching partner who they would coteach with in the spring semester. Together these intern pairs cotauted a microlaboratory lesson and coplanned a curriculum unit. All interns also spent 20 hours
observing their future cooperating teachers at Biden High School (BHS) during the fall semester (Program syllabus, Intern and Administrator interviews). (For more information about how the interns and cooperating teachers were prepared for coteaching see Scantlebury, Gallo-Fox, and Wassell, 2008).

The full practicum was a fifteen-week experience completed in the spring semester, of the preservice teachers’ senior or fifth-year. During that semester they attended a non-graded weekly seminar that accompanied the full practicum experience and were concurrently enrolled in a 1-credit classroom management course. Since the 2003-2004 academic year the State University Undergraduate Secondary Science Education Program’s model for student teaching has been coteaching. This is the only teacher education program at the university to utilize the approach for student teaching and was adapted based on the program administrator’s experiences with the University of Pennsylvania coteaching model with the master’s program in secondary science education. This model was adapted to fit to State University’s needs and resources based on theoretical and philosophical grounds of coteaching as delineated in chapter 2.

When the spring semester began the coteachers drew upon past experiences, video footage, stories shared, the theories of coteaching and the tenets of cogenerative dialogues introduced during the science methods course and professional development meetings in shaping their work. However as the interns had reported in their January and May interviews they were not necessarily sure what this would look like before the coteachers actually began coteaching together.
With the exception of a few inclusion science classes cotaught with Joan Harris, Biden High School’s science special educator, coteaching was not typical practice for the science department teachers all of whom were accustomed to independently teaching in their own classrooms. Coteaching as practice and a model for learning to teach was enacted only during the spring semester when interns worked in the classrooms. During the coteaching semester the teachers assumed dual goals around learning. Their central focus was on the learning of the high schools students in their science classrooms, and a secondary focus was on the interns’ learning to teach as part of the coteaching experience.

Coteaching interns were expected to be involved in classroom teaching on the first day of the coteaching practicum. All interns cotaught the first day. They assumed various roles in the classroom—tutoring groups of students, working with individuals, leading discussions or asking and answering questions; the extent of involvement depended upon previous preparation and planning with coteachers and personal comfort levels (Field notes).

**Coteaching assignments: Non-traditional full practicum placements**

Teaching placements for the cohort of teaching interns at Biden High School were complicated. The eight interns were assigned to eight of the teachers in the department, however they were not assigned to a single cooperating teacher as is often done in traditional student teaching arrangements (Guyton & McIntyre, 1990). Rather, each intern taught with up to four cooperating teachers and two other interns over the course of each school day. Each intern had an intern teaching partner. Each intern pair then was
assigned to work with two or three cooperating teachers who had their own classroom. Additionally, five of the interns also cotaught with a certified special educator with a chemistry degree who worked in inclusion science classes to support mainstreamed students with Individualized Education Programs (IEPs). Coteaching groups were generally organized around disciplinary specialization (i.e. Biology, Chemistry, Earth Science). For example, Chemistry interns worked together and with the other Chemistry teachers in the department. Course assignments reflected teachers’ disciplinary background and also included interdisciplinary science classes\(^4\). Coteachers were sometimes paired across content area for the interdisciplinary courses Environmental Science and the Coordinated Science classes I, II, and III\(^5\)—integrated science classes for grades 9, 10, and 11. Table 3.3 lists interns’ disciplinary majors, intern pairs and cooperating teachers and the list of courses that they taught. Arrows on the chart link the interns to the cooperating teachers that they worked with and the courses that they were collectively responsible for.

\(^4\) All science teachers at BHS taught interdisciplinary science classes; interns were expected to as well.

\(^5\) The teachers at BHS called the Coordinated Science classes Coor I, II, and III.
<table>
<thead>
<tr>
<th>Intern Science Disciplinary Major</th>
<th>Intern pairs</th>
<th>Cooperating teacher and courses taught</th>
</tr>
</thead>
</table>
| Chemistry                         | Amanda       | • Pam: AP Chemistry; Pam and Joan: Coor II and III inclusion classes  
|                                   | Joe          | • Tim: Chemistry, Honors Chem, Coor II Chem Honors |
| Biology                           | Samantha     | Henry: AP Biology, Coor II, Coor II Bio Honors  
|                                   | Sean         | Patsy: Anatomy and Physiology, Period 1 inclusion class with Joan; Coor II |
| Biology                           | Bernadette   | Anne: Forensic Biology; Coor II         |
|                                   | Luke         | Vincent: Environmental Science (Interdisciplinary), Period 6 inclusion class with Joan; Coor II |
| Earth Science/Geology             | Javier       | Jeanine: Ninth Grade Academy Science (Coor I), Period 3-4 (Block scheduling) inclusion |
|                                   | Julie        |                                        |

During the 15 week coteaching practicum, interns were each responsible for teaching five class periods a day. They cotaught four of these classes and “Solo” taught one class. They did not coteach all of their cotaught classes with their teaching pair, rather many different combinations of coteachers were represented in the daily schedule. When coteaching, interns always taught with at least one cooperating teacher or the special educator, however the number of coteachers and who the coteachers were shifted each class period. Possible teaching combinations are represented in Figure 3.3.

Placements were designed to provide experience teaching a wide-variety of courses in order to provide interns with a range of teaching opportunities (Claire, Interview, November 2003). Interns taught a variety of types of courses and tracks (interdisciplinary science, required classes, and elective courses). Additionally,
Solo Teaching
Intern teaching alone
Intern teaching with support of cooperating teacher (This was more typical in beginning of semester, but occurred across whole semester & during labs for legal purposes)
Intern working with inclusion teacher (from mathematics) who did not participate in coteaching community

Coteaching Configurations
Intern and cooperating teacher
2 Interns and 1 cooperating teacher
1 Intern, 1 cooperating teacher, 1 inclusion science teacher
2 Interns, 1 cooperating teacher, 1 inclusion science teacher

Figure 3.3. Possible solo and coteaching configurations

Each intern taught different grade levels (introductory and upper level courses), tracks (honors track, general track), and five of the interns also taught inclusion courses for mainstreamed students with IEPs. Two interns taught in the 9th grade academy, which utilized longer length class periods and block scheduling, in addition to teaching more a traditional 50-minute class used by grades 10-12. Through these varied assignments interns taught a mix of different courses, grade levels, tracked student groups, types of bell schedules, and also experienced teaching inclusion classes. Intern schedules are located in Appendix B.

Research participants

Eight of the nine preservice teachers placed at Biden High School agreed to participate in the coteaching implementation study. The experiences and perceptions of these eight interns within the community of practice are the focus of the study. Learning within a community of practice assumes a dynamic environment with interactions with
multiple professionals within the field; therefore data also includes documentation of the experiences and perceptions of the eight cooperating teachers involved in the community of practice.

While the experiences of the teaching interns are the focus of this study, central emphasis of the research question is on the learning within the context of a coteaching community of practice. As such, data from cooperating teachers is also used to inform this study. Interactions between interns and cooperating teachers will be analyzed and cooperating teacher perspectives provide additional data sources.

Teaching interns were recruited to participate in the coteaching implementation research study during a science methods course in Fall 2004. I attended the meeting and with the instructors out of the classroom I explained the study to the participants, my role, issues of confidentiality, and risk inherent in the study. At this point interns could either sign up to participate in the study or email me individually. The first interview began with a review of the informed consent process. The preservice teachers were asked to sign the consent forms. I received one copy of the form and the other was given to the participant. Biden High School’s cooperating teachers were recruited in a similar way. They were formally asked to participate at a professional development meeting about the coteaching. Consent forms were then distributed and signed prior to the beginning of data collection.

*Biden High Science Department: A community of practice*

Pam Alder, Biden High’s science department chair has suggested that of the reasons that teachers join and remain in the science department at Biden High is its
collaborative and supportive culture (Pam interview, October 2003). This culture has 
historical roots partially originating from the small size of the science department, a need 
to share limited resources, and collaborative curriculum development. Originally a small 
rural school with limited resources, teachers are accustomed to sharing equipment and 
supplies. Additionally, several years ago the teachers worked together to develop 
interdisciplinary science curricula for 9th through 11th grade students. These courses are 
called Coordinated Science I, II, and III. It is the nature of these interdisciplinary courses 
that Pam, the department chair, attributes to some of the cohesiveness of the department. 
As an interdisciplinary science curricula teachers are forced to teach some topics outside 
of their content area each time they teach a Coordinated Science class. This has required 
that teachers work together to support each other’s practices particularly when new 
people join the department.

Teachers in the science department communicate regularly and support each 
other's practice in addition to helping each other with the coordinated science classes. 
The science teachers receive frequent email updates from their department chair and also 
use email to coordinate the use of equipment, to share assessments and lesson plans, and 
to plan instruction with the inclusion teacher. While the science teachers' classrooms are 
spread throughout the building, the classrooms are clustered together in groups of two to 
three. This enables them to easily talk about practices and share equipment. Additionally, 
although divided across gender lines, many of these teachers regularly eat lunch together. 
While lunchtime conversation is typically social, this is also time used problem-solve and 
discuss curricula and practice. Many of the teachers at Biden High believe that the
downtime during the day is an important element in their work, one that enables them to stay fresh throughout the day. They also feel that their social and supportive relationships with their colleagues add to their practice. Overall, the science department is characterized by a sense of mutual respect for each other as professionals. (Sources, Pam interview, Fall 2003; Cooperating teacher interviews, Spring 2004, 2005; Field Notes, 2003-2004). The department's history of collaboration and its sense of community is one of the reasons that Claire Lyons selected Biden High School as a school for placing student teachers (Claire interview, Fall 2004).

**Researcher access**

From Fall 2003 through Fall 2005 I worked as a research associate studying the implementation of the coteaching model of student teaching by an Undergraduate Secondary Science Education Program at a mid-Atlantic State University. I was involved in all aspects of the study from research design and IRB approval through analysis and publication stages. My role on the project was to serve as an independent researcher—someone not connected to the students' course grades or involved in their hiring process. I served as a third party researcher collecting and analyzing data that remained confidential and was not shared with the program administrator until after all course grades have been assigned and the interns had graduated and obtained jobs. I worked with all stakeholders involved in the implementation of the model during the 2003-2004 and 2004-2005 academic years.
The implementation study, approved through the State University’s IRB board, had a much broader scope than the research questions studied for this dissertation. The goals of State University’s study were to examine the implementation of the coteaching model in suburban setting. Additionally, the study followed program graduates into their first year of teaching. This was an evaluative study: careful attention was paid to the ways in which the model manifest in the field. Analysis focused on both the implementation of the model and its ongoing improvement. Utilizing a feminist ethic of care, a feedback loop was implemented in order to addresses issues as they were identified rather than to wait until the following implementation year (Gallo-Fox, Wassell, Scantlebury, Juck, & Gleason, 2005). Data collection and analysis were part of an on-going recursive process with one informing the other.

The following types of data were gathered: interviews, observations (field notes), audio and video recordings of situated interactions, email communications, and documents (reflective journals, instructional materials, and course assignments). In all, thirty-three participants working in five different high schools participated in the study during the first two years in which the coteaching model was implemented.

This dissertation focuses on a subset of the larger project's data and examines sub-questions that emerged while working in the field. While these research questions emerged from the larger study, they have a distinct focus that is separate from the larger study, and the dissertation question and research are my own. All of the data were collected while I worked as an educational researcher studying the implementation of the coteaching model at a Mid-Atlantic State University. I was the primary researcher.
working at Biden High School. As part of my role, I developed the research instruments and collected all of the data regarding this community of practice. This dissertation study was a re-analysis of the cleaned pre-existing data set that did not contain any identifiers or links to the research participants, and was considered to be a minimal risk-study. It was approved through Boston College IRB with exempt status. The consent forms found in Appendix C, are from the original implementation study approved through State University.

**Researcher reflexivity**

Researchers… who hold a situative perspective, remind us that we are inevitably part of the contexts in which we seek to understand teachers’ knowing and learning. Rather than pretending to be objective observers, we must be careful to consider our role in influencing and shaping the phenomena we study” (Putnam & Borko, 2000, p. 13).

As Putnam and Borko remind us, sociocultural theorists pay particular attention to the roles that they play within the research context and in the lives of the participants that they study. This is particularly important within studies of teaching and learning. Putnam and Borko write, “As researchers trying to understand what teachers know and how they learn, we must be particularly attentive to the support and guidance that we provide” (p. 13). In this section I discuss issues of researcher reflexivity and describe the delicate line that I walked as researchers and also a peripheral member of the coteaching community of practice.
While I viewed my role as an independent researcher, who was in the field to study the coteaching experience, I also recognized that within the field of coteaching research, researchers are expected to participate in the setting in order to better understand the nature of the experience (Tobin, 2006, p. 134). Furthermore, the implementation study was situated within a feminist ethic of care (Gallo-Fox, Wassell, Scantlebury, & Juck, 2006; Noddings, 2001). I believe that the researcher-participant relationship is not a unidirectional one, with the researcher collecting data and learning about the participant’s lives without reciprocating. As such I felt that it was important to support the research participants through the sharing of resources that I collected and by being available to talk about practice if participants wanted to.

All of the data that I collected were available to participants upon request and all participants were given multiple opportunities to review their interview transcripts. A few of the interns borrowed videotaped and field notes in order to gain another perspective into their instruction. Later in the semester many of the interns borrowed videotapes that I had made of their classes for their reflective assignment.

On numerous occasions throughout the semester cooperating teachers and interns talked to me about dilemmas in practice and group interactions. I generally served as an active listener, or a sounding board. In other instances, we discussed the problematic situations and developed strategies for trying to address a problem. Often, I asked participants if they had talked about the issue with their coteachers and encouraged them to try to work out the situation with their colleagues. There were times when coteachers did sit down and talk about things, however there were also times when the power
dynamics between cooperating teachers and interns led interns to find a different way to address the problem, or they decide to endure the situation.

There were times during the data collection where I wondered about my role in shaping the experiences of the participants. During the second phase of the study when I was observing one intern across a full teaching day, we typically spent 20 minutes debriefing informally about the day. Much of this time was spent with the interns reflecting on their day. During these exchanges, I noticed that the interns were fairly reflective about their practice and thoughtful in how they adjusted their teaching from class to class. I wonder if these debriefing sessions may have played a role in shaping the interns’ practice, however I do not have any data that speaks to this one way or another. I should note, however, that reflective practices was a goal of State University’s coteaching model and also an integral component of semester assignments such as the reflective journal and the video reflection assignment (Interview Claire Lyons; Program documentation). Finally, on rare occasions when the situation warranted it, I assisted in the classroom by providing an extra set of hands or support during a busy laboratory. This was a rare occurrence, however, and for the most part I tried to be an unobtrusive smiling observer in the back of the classroom.

I realize that I became a peripheral member of the community through my availability and willingness to talk about practice and the coteaching experience. Additionally, I was at Biden High more frequently during the semester than either the clinical supervisors, or the program administrator who was only an email away.
Regardless, I was surprised when at the end of semester many of the participants thanked me for my help and support throughout the semester.

**Trustworthiness and study limitations**

Theories of triangulation are frequently used to support qualitative findings and issues of validity. Such approaches point to the notion of a single truth or a “fixed point” (Richardson, 2000, p. 934) that can be verified and identified. However, in a sociocultural study of a community with multiple participants working within numerous varied contexts for learning and interacting particularly in a profession that values the individuality of professional action, a single truth cannot be assumed. Naturally there will be patterns of practice and coherent themes, however there is also a need to accommodate for difference and variability. Not all individual participants have the same perspectives and backgrounds, nor do all participants act consistently across various contexts.

Richardson (2000) has argued for a theory of crystallization as new way of understanding issues of validity and trustworthiness in qualitative research. She writes,

> The central imaginary is the crystal, which combines symmetry and substance with an infinite variety of shapes, substances, transmutations, multidimensionalities, and angles of approach….Crystals are prisms that reflect externalities and refract within themselves creating different colors, patterns, and arrays casting off in different directions. What we see depends upon our angle of repose. (p. 934)

Writing about the process of crystallization, Janesick writes “What we see when we view a crystal, for example, depends on how we view it, how we hold it up to the light or not”
This approach towards trustworthiness makes theoretical sense within this sociocultural study that draws upon a *logic-of-inquiry* methodology. Looking across multiple planes of development and utilizing a range of analytical approaches, I have constructed a series of images that all coalesce around the participants’ experiences within Biden High’s coteaching community of practice. These experiences are rich and varied and in great detail present multiple facets about what it meant to participate and learn within this community.

*Limitations of the study*

This research study examines the experiences of sixteen people engaged in the work of teaching high school science. Although the analysis presents an in-depth description of what occurred and addresses known gaps in the research literature, these are the experiences of one group and are not generalizable across all contexts. However, this study as a whole describes in detail what happened within this cohort coteaching context and presents the learning experiences of participants within the coteaching community of practice at Biden High. Such discussion provides insight into the potential of coteaching cohort models for supporting teacher learning. Of particular note is the fact that not all of the research findings report on

Limitations of the data set and analysis exist as well. A key limitation of the slice of life data set is also its strength. This slice of life has a very heavy emphasis on the initial coplanning meeting when the coteachers began to develop the unit and the modeling activity; 68% of the data set in fact is comprised of the transcription of this part
of the coplanning meeting and the related field notes. However, the dialogue in the coplanning meeting is rich and clearly shows intertwining of voices and valuing of all coteachers as important contributors to the process. While the coplanning meeting is rich, observational data of classroom instruction is limited to only one class period from my early weeks in the field. Furthermore, these are not the richest field notes of the set and little classroom dialogue is captured; as the semester progressed I found that my note-taking process became more focused and also included more aspects of classroom interactions. Despite the limitations of these fieldnotes, these data provide insight into how the coteachers’ plans for practice were implemented within the classroom, the ways that the coteachers worked together to contribute to one another’s and the group’s collective practice in the classroom. Finally, they include teachers’ reflective remarks about the experience.

I believe that the stretch of time represented in the data set and the fact that the experience continued to bubble up in the data across a span of five months time indicated the importance of this experience for the teachers—all of whom spoke about it (unprompted) during at least one interview. It is my belief that the strengths of this data set far outweighed the limitations and warranted my efforts. Furthermore, the findings reported in these chapters are reflective of the experiences of the larger coteaching community and are mirrored within the practices of the other micro-communities although to varying extents. Overall, when viewed as a cohesive data set, the Anatomy and Physiology Sarcomere “slice of life” provides a venue for analysis about how the
Anatomy and Physiology group afforded each other with rich opportunities for learning about practice.

Rogoff’s analytical framework (1995) as described earlier in this methodology chapter, provides one way for addressing the limitations of the focused data set. Rogoff describes the importance of being attuned to the large context and other layers of ongoing development within any experience. This sensitivity to the broader experience provides a ways to address some of the limitations regarding the focused data set. I found that by drawing on the broader experience to inform my understanding I was able to support the analysis and also bring in examples and counter examples. As such, within the analysis reference is made to the broader context of the coteaching community of practice in order to illustrate how these practices are reflected in the experiences of the larger coteaching community of practice. Such comments are made in order to illustrate the commonalities across experiences and to support the interpretation of the experience (Bloome & Engan-Robertson, 1993).
Learning within sociocultural contexts entails more than acquiring the formal knowledge of the community. As Lave and Wenger (Lave & Wenger, 1991; Wenger, 1998), Gee (1992, 1996), and Rogoff (1995) have all argued part of learning within a community entails developing the cultural practices of the community and becoming recognized as a community member. In order to be recognized as a member, one needs to come to talk, behave and think in ways that are recognizable as aligned with existing community members. Wenger (1998) studied the experiences of insurance claims processors. He describes the process of becoming a claim processor in the following way:

What claims processors learn cannot easily be categorized into discrete skills and pieces of information that are useful or harmful, functional or dysfunctional. Learning their jobs, they also learn how much they are to makes sense of what they do or encounter. They learn how not to learn and how to live with the ignorance they deem appropriate. They learn to keep their shoulders bent and their fingers busy, to follow the rules and to ignore the rules. They learn how to engage and disengage, accept and resist, as well as how to keep a sense of themselves in spite of the status of their occupation. They learn to weave their work and their private lives…. What they learn and don’t learn makes sense only as part of an identity, which is as big as the world and as small as their computer screens. They become claims processors. (pp. 40-41)
A central goal of this chapter is to illuminate the experiences of the interns as they participated in the coteaching community of practice. What was the nature of the coteaching community? What cultural practices and Discourses (Gee, 1992, 1996) did the interns access through their ongoing engagement in the community, and as a result what ideas, behaviors, and ways of thinking about teaching were they afforded opportunities to learn about? It was clear from the data that the coteaching semester was a time of transition for the interns who were shifting from full-time roles as University students into the world of teaching. This was particularly evident even in the early weeks of the coteaching semester as the interns talked about struggling to get up at 5:30 AM, wearing professional attire instead of their comfortable sweat pants, spending the full day teaching at Biden High, and then bringing work home and working late into the evening (Fieldnotes; Intern interviews, March and May). These teaching lives presented a marked contrast to University roommates who were still taking courses and were anticipating graduation. Interns talked about how tired they were, and the “loss of their social life” (Fieldnotes; Intern interviews, March and May). These changes reflect the shifting of lifestyle of a University student to professional teacher. However, the patterns described above do not speak to the actual learning experiences within the coteaching community of practice.

As I analyzed the data from Biden High School it became clear that across the instructional day, the coteachers participated in a wide range of activities and behaved very differently according to setting. This helped me to realize that within different parts
of the school day participation in the life of the coteaching community looked very
different and required the coteachers to behave and interact differently.

Typically, student teaching experiences are studied through the combination of
observations of instruction and interviews before and after the full practicum setting. The
emphasis of this research is typically on the instructional aspects of the practicum
experience. However, as it was apparent from the data, the coteachers engaged in a wide
range of practices across the entire school day. Focusing my analysis specifically around
classroom instruction would have limited insight into the experience of learning within
this community. In early work entailing the potential of ethnographic methods for
understanding the teaching experience, Warren (1969) argued that there was a need to
open up the research lens beyond the scope of teacher and student instructional
interactions. He wrote,

The preponderance of research on teaching has focused on teacher behavior in the
classroom to the exclusion of significant sociocultural, contextual forces, and
conditions which affect how teachers structure their classroom performance and
what they invest in it. Many encounters which either present teachers with
difficulty in effecting satisfactory closure or help them attach new meaning to
their occupation do not embody the stereotypical teaching experience, i.e., the
classroom with the teacher at the front, text in hand. Such encounters often occur
outside the classroom; they may not involve students. (p. 18)

Following the work of Warren (1969), in this chapter I present a broad range of activities
that the interns participated in as a regular part of their full practicum experience. My
argument is that these activities, along with the values and beliefs of the community participants, served an important role in the interns’ development as high school science teachers. Across the semester interns were granted full access to their coteachers’ culture of practice and the Discourses of the community, and became fully immersed in the work of teaching. They were pressed with the multiple responsibilities of the teaching while simultaneously learning alongside peers and cooperating teachers how to juggle the demands of the job. This experience was highly interactive and supported, and throughout the day interns and cooperating teachers were focused on the dual demands of teaching science to their high school students and on the intern’s experience learning to teach. This findings chapter, in conjunction with Chapter 5, focuses on the experience of learning to teach high school science within a coteaching community of practice from the community plane (Rogoff, 1995). Together these chapters provide an overview of the nature of the experience of participating in coteaching community of practice at Biden High through discussion of the typical activities of the coteachers.

Throughout this dissertation, I identify the coteachers as a coteaching community of practice. Wenger (1998) defines a community of practice as a group of people engaged in mutual practice, joint enterprise, and shared repertoires. He explains that communities of practice are formed “because they [community members] sustain dense relations of mutual engagement organized around what they are there to do” (p. 73). In this study, the coteachers were mutually engaged in the task of teaching their high school science students. Furthermore, the community of practitioners was created through the structures of the cohort coteaching model with the intent of providing a rich learning experience for
the interns. Wenger argues that, communities of practice form “tight node[s] of interrelationships… [that] arise out of engagement” (p. 76) and the constructions of practice, or “meanings that they negotiate with one another” (p. 73). As the coteachers from BHS worked together, they constructed their practice together in coplanning meetings and then adjusted plans for practice throughout the day during cotaught classes and also between classes. This process was reflective, ongoing, and mutual.

The varied activities of the community provided access to different aspects of practice undertaken by the science coteachers at Biden High School. This is important to understand, as theories of workplace learning (Billett, 1998, 2002), on-site professional learning within a community of practice (Lave & Wenger, 1991; Wenger, 1998) and organizational learning theory (Orlikowski, 2002) all argue that a critical component of the learning that occurs within professional settings is the learning of cultural practices and participation structures. Lave and Wenger call this the “learning curriculum” (p. 97) and describe it as the “culture of practice” (p. 95). Lave and Wenger argue that through participation in a community of practice one learns how to participate within it. They write,

An extended period of legitimate peripherality provides learners with opportunities to make the culture of practice theirs. From a broadly peripheral perspective, apprentices gradually assemble a general idea of what constitutes the practice of the community. This uneven sketch of the enterprise (available if there is legitimate access) might include who is involved; what they do; what everyday life is like; how masters talk, walk, work, and generally conduct their lives; how
people who are not part of the community of practice interact with it; what other
learners are doing; and what learners need to learn to become full practitioners. It
includes an increasing understanding of how, when, and about what old-timers
collaborate, collude, and collide, and what they enjoy, dislike, respect, and
admire. In particular, it offers exemplars (which are grounds and motivation for
learning activity). (Lave and Wenger, 1991, p. 95)

Lave and Wenger (1991) emphasize the importance of legitimacy of the
newcomers as members within a community, arguing that membership must be supported
and enabled in order for new participants to access and learn the community practices.

**Participating in Biden High’s coteaching community of practice**

At the beginning of the semester the school administrators at Biden High provided
a special orientation for the interns. All interns were given school identification, email
addresses, parking places, and also access to the computer system and school library, and
classroom keys. As Claire, State University’s secondary science program administrator
explained, “They [the school administrators] are really embracing the student teachers
as teaching interns, yes, as teachers, and looking forward to them being there full time”
(Interview, 11/11/03). These special arrangements helped support the interns’ access to
school resources and work as community members during the semester. Such efforts
were in keeping with a sense that within this high school community the interns were
valued participants. Cooperating teachers facilitated entry into the classrooms by opening
up their classrooms and volunteering to coteach with interns. Pam, Biden High’s science
department chair and coteacher of the interns’ Science Methods course (Fall 2004), and Claire worked together to match up teaching interns and cooperating teachers. The teaching schedule was created by Pam, who utilized input from the cooperating teachers regarding which classes they felt were best for solo teaching or coteaching. Classes assumed to benefit from coteaching due to the increased numbers of teachers in the room, included large classes and those with students with identified special needs (Claire Interview 11/11/03; Pam, Interview, 10/23/03; Fieldnotes; Program Documents). During the early weeks cooperating teachers helped interns move from peripheral roles such as attendance, handing out papers, working with small groups of students, and reviewing homework towards into more central roles of instruction by encouraging the interns to lead classroom activities in cotaught classes and supporting them as they made these transitions. Additionally, cooperating teachers supported interns as they assumed the responsibility of their solo class (Fieldnotes, 2/17/05, 2/22/05, 2/24/05; Interviews).

Throughout the semester cooperating teachers expressed the belief that interns’ involvement in the classroom helped support and enhance student learning by increasing the student-to-teacher ratios and opening up increased opportunities for students to work with teachers in individual and small group settings (Fieldnotes; Interviews).

Access to the work of the community of practice and transparency of practice is critical for newcomers to learn the cultural practices of the community (Lave & Wenger, 1991). One of the ways that interns gained important access to the routines of the community was through daily participation in community practice alongside the cooperating teachers and through on-going conversations about practice between
community members. As the coteachers worked together and created plans for instruction they shared their ideas, thoughts, perspectives, and perceptions about practice. As they explicated their ideas, each other’s understandings were opened up and made transparent. Patsy (cooperating teacher) described the nature of these interactions as if her “brains were coming out in the open.” In reflecting on the coteaching experience at the end of the semester, she said,

*I think I’ve learned a lot more about styles working with other people because you become more verbal in terms of the co-planning. I’m hearing more about what I’m thinking now. It’s like my brains are coming out in the open…I see that and they [my coteachers] see that.* (Seminar, 5/10/05)

Patsy’s comment refers to experiences coplanning, however, the coteachers interacted throughout the day about their work (Fieldnotes). The spaces for participating in and interacting about practice include both formal and informal contexts as is described in this chapter. As is illustrated, the different routines and structures of the school day afforded interns with access and opportunities to participate in the cultural practices of the community. Across the day the coteachers’ activities varied greatly. The varied contexts afforded interns with access and transparency to the practices of teaching high school science at Biden High School and comprised a key part of the learning curriculum within the coteaching community. Within these contexts the interns gained access to the work of teaching science at Biden High and participated in the community’s culture of practice.

I begin by describing coplanning meetings because of the unique role that they played in the coteachers’ practice. I then address the daily activities of coteaching practice. Discussion seeks to highlight key patterns of activity in order to show different
patterns of practice across the day and to illuminate how these different experiences collectively comprised the coteachers’ practice. Furthermore, attention is paid to key practices and dynamics of each context in order to illustrate how these parts of practice afforded interns different opportunities to learn about the work of teaching.

Coplanning

Coteaching places unique demands on teachers who share classroom space and responsibility for student learning, as there is a need to develop mutual understandings so that they can work together and teach students in a unified way. In order to do this successfully, coteachers needed to form a consensus about their pedagogy, their purpose for instruction, and their expectations for students and student learning (Scantlebury, Gallo-Fox, & Wassell, 2008). Coplanning was critical in the coordination and negotiation of these shared understandings and the construction of coteaching practice, because “without coplanning, teachers did not have common understandings of classroom instruction and had divergent goals for students” (Scantlebury, Gallo-Fox, & Wassell, 2008, p. 972). Agreement about the scope and sequence of curriculum, content to be covered, and goals for student learning were needed along with a common plan for action. Coplanning decisions played an important role in how the coteachers shaped their practice and framed their roles as teachers and their relation to knowledge in the classroom. This section describes the practices of coplanning in order to illustrate how coteachers engaged in the work of coteaching during these times.
Coplanning was a formal activity that occurred during weekly scheduled meetings for the purpose of planning. Typically, these meetings occurred near the end of the week, either after school or during common planning periods (Fieldnotes). Interns were required to submit electronic weekly lesson plans for each class to their supervisors and the Program Administrator by 5 PM each Sunday — these meetings helped them prepare for this task. However, the coplanning meetings did more than simply provide interns with information needed to write lesson plans. Coplanning meetings served as the site for developing plans and mutual understanding for practice, and lead to the alignment of plans for practice in regard to curriculum and pedagogy. These coplanning meetings shaped how the coteacher unit constructed themselves in the classroom.

Coteaching groups of three to six people scheduled coplanning sessions most regularly. Despite the need to coordinate plans with as many as six people, as with the Environmental Science group, these groups typically ended up being more coordinated and had lessons that were well planned (Fieldnotes). In instances where only one intern and one cooperating teacher taught together, coplanning meetings were often left to the last minute. This resulted in less coordinated practice or created situations where one individual needed to direct the lesson (Fieldnotes; Interview data). In instances where coteachers did not coplan, classroom practice was not coordinated and coteachers were unprepared to participate in the collective effort of instructing students (Fieldnotes). The coordination problems that can result through the failure to coplan has been noted in research by Bullough and colleagues (Bullough et al., 2002) on partnered full practicum experiences, and in studies by Tobin (2006) on coteaching. The State University
coteaching model highly emphasized the importance of coplanning. Only on rare occasions did coteachers miss scheduled coplanning meetings (Fieldnotes, 2/17/05).

While all coplanning meetings shared the common goals of figuring out what would be taught in the upcoming weeks and discussing pedagogical approaches to be used, not all coplanning sessions were alike. Depending on the coplanning group, the process was either mutually collaborative, or hierarchical and directive (Scantlebury, Gallo-Fox, & Wassell, 2008). Some of these differences reflected cooperating teacher stances on coteaching, and the extent to which they ‘bought in’ to the coteaching philosophy. Other differences between coteaching sessions resulted from time constraints, group dynamics and goals for the coplanning meetings such as whether participants “scripted” practice in a detailed way, or whether they framed practice in terms of big ideas and concepts to be taught (Fieldnotes; Sean Interview, 5/20/05). Some groups were more likely to use their time to share ideas, collectively brainstorm, and discuss curriculum content and issues of pedagogy in order to together develop plans for practice. This was typical of Environmental Science group coplanning meetings. In contrast, the coplanning process was more hierarchical and directed by cooperating teachers when they were crunched for time, felt restricted by existing curricula or testing programs6 (i.e. Advanced Placement Classes), or were not open to changing existing curriculum or incorporating new ideas into practice (Scantlebury, Gallo-Fox, & Wassell, 2008).

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6 In 2004-2005 when the study was conducted, high school science test scores were not used in calculating school rating for in the state accountability program. The high school science teachers and chairperson indicated that they did not feel pressure regarding the state science tests administered to 10th graders.
From the perspective of the interns, the most valuable and productive coplanning sessions were those in which their voices were valued and they could contribute to the development of the plans (Fieldnotes, Interviews). These coplanning meetings provided space for the exchange of ideas and the mutual construction of local knowledge. One example of this occurred on February 17, 2005, during the second week of the coteaching semester as the Environmental Science began to develop plans for the fossil fuel unit. During the planning meeting Vincent, the cooperating teacher, suggested that they might use a “pair-share.” After two other interns and Vincent used the term “pair-share” an additional six times Luke asked, “This might, probably, sounds ridiculous, but what is a pair-share thing?” Luke’s question launched a conversation in which each of his coteachers in layered conversation developed a definition of the term and described what it would look like in the classroom for this activity.

BERNADETTE: It’s when they find a partner and then get out a piece of paper and answer some questions, and they discuss it.
LUKE: With each other?
BERNADETTE: They share with each other.
JAVIER: It could be a pair-share activity. You could have questions on the overhead or, like with your partner—“Find a partner sitting next to you, please,” you know, “answer these questions.”
JULIE: Share their knowledge at the beginning of the chapter. What is a fossil fuel? And what do we use fossil fuels for in everyday life? Or something like that.
Vincent: What is fossil fuel? Name three examples. Where do they come from? How are they formed?
JULIE: And do the pair-share and then bring them back as a class and discuss it.

Coplanning meetings provided an open forum for coteachers to ask question and talk about their shared practice. The topics discussed in coplanning meetings are too many to list. However, all aspects of practice were discussed. Coplanning discussions were
frequently pragmatic encompassing curriculum scope and sequence, goals for content coverage, classroom routines and structures, issues of pacing, assessment, discussion of available resources. Furthermore, they reflected insight from practice and were grounded in reflection on experience. Across the semester, all coteachers shared insights, provided advice, debated ideas, talked about prior experiences, and effectively created a pool of collective understanding for practice (Fieldnotes, Coplanning meeting transcripts). This provided an opportunity for coteachers to access other coteachers’ ideas and perspectives about their work.

Regardless of whether coplanning meetings were cogenerative or more directed, interns gained experience working with experienced practitioners on the planning process. Differences among the types of coplanning sessions were related to issues of transparency and access (Lave & Wenger, 1991). On March 3, 2005, I observed Joe (intern) participate in two coplanning meetings for two different courses and with two entirely different groups of coteachers. After his second meeting he contrasted the coplanning experiences explaining that, “the difference between the two meetings is, “Okay, let’s plan. What are your ideas?” Versus, “Okay, tell me what we are going to do? …. Meetings with Pam and Joan [Coor III Inclusion cooperating teachers] are to find out what has been planned.” As I wrote in an analytical memo about the earlier meeting, “Interns are there to be informed, and when you are there to be informed, you are there as a listener and as a learner—if there is learning to be going on. It is more about getting information and less about being an active participant in the process” (Memo, 03/03/05). Joe’s comparison of the two different meetings reveals issues of
access, power, voice, and personal involvement in the coplanning process. In the first meeting Joe was able participate in the process of planning for instruction, in the later meeting he was afforded with opportunities to see how those cooperating teachers approached their practice. These examples illustrate different ways that intern participated in the coplanning process depending upon the group of coteachers with whom they were working.

Coteachers spent most of the instructional day together; much of their time was spent teaching and juggling with intense workload and continual demands of the job (Fieldnotes). Coplanning sessions provided important opportunities for coteachers to talk about practice in time reserved to discuss practice. Little (2002, 2003) notes that productive opportunities to talk about practice and learn together occur rarely in the work of practicing teachers. She notes that such discussions can afford important opportunities for learning about practice when the take place within professional learning communities. Coplanning meetings provided an important space for coteachers to construct common understandings for practice and their upcoming work. Furthermore, these meetings were a key space where coteachers created cohesive plans for practice that supported coordinated classroom practice.

*Bright and early: Carpools, morning prep and breakfast with coteachers*

The interns typically left for school at 6:30 AM. It was a half hour drive from State University to Biden High. Most of the interns drove together in carpools, which had initially started as a money saving effort. On morning rides interns typically discussed the
work that they had completed the night before, including materials prepared for cotaught classes and discussed upcoming instruction (Intern Interviews). Sometimes interns relied on each other to help prepare for the day. As Bernadette explained,

*We’d chit-chat—it depended, sometimes we’d be like, “Hey, did you get that done?... How’d it come out?” And then sometimes, which is really bad... we’d be like, "What are we doing today?" ... Like, "What exactly are we doing today, because I don’t really know." —So, we’d talk about it.* (Bernadette Interview, 5/20/05)

Interns arrived at school between 6:45 and 7:10 AM and had approximately a half hour to get settled into the day before classes started at 7:31 AM. Interns generally described this as a time to check in with their cooperating teachers and review plans for the day. Several of the coteachers had these conversations over breakfast in the classroom. As Sean explained,

*I'll stop in Dr. Anderson's room... I'll just kind-of hang out there, talk to him about everything. Kind-of go over what we're going to do in the day briefly, like I already know, but just kind-of go over it. Sometimes look at the warm-up he picked out. Then like around 7, I'll go over to Patsy's room, get breakfast... and then sit there and just relax and talk about what we're going to do the first period. Talk about just how yesterday went, like everything like that, just talk. And then like, period 1 starts.* (Sean Interview, 5/20/05)

Sean described a fairly relaxed time, however as others explained it was also time to get materials situated, set-up the classroom and multimedia equipment, and “rush” to deal with any last minute copying or lab preparation for the day (Fieldnotes, Interviews). Julie described time before school started as important time for getting set up for class,

*I really needed to be set up. Like, everything for my lesson laid out, nice and neat. I know where everything is. Like all grades entered. All papers ready to go back. ... And it would pretty much putting the 3-2-1 [warm-up] question on the board, or writing the schedule for the day on the board. Putting the homework on*
the board. And just if I needed the overhead, going and getting it … Anything along those lines. Getting a video cued up if I needed that… (Interview, 5/23/05)

How much the interns could complete in the mornings was variable and depended upon carpool members punctuality, lines at the copier, surprises when the copier was broken, or students who arrived to class early to talk, ask questions, or receive extra tutoring (Amanda Interview, 5/25/05; Fieldnotes). Once first period started, the rest of the day was spent teaching students either in coteaching or solo instruction formats. Instruction was broken up by two prep periods and a twenty-three minute lunch period each day.

In summary, carpools and the interns’ time on campus before classes began provided time to prepare for the day, coordinate instructional plans with coteachers, and to review what had been prepared for classes during the evening. Carpools provided the majority of interns with a collaborative time with peer coteachers to coordinate their coteaching on a daily basis. Although the carpools were not explicitly designed for the purpose of planning, this time helped to support instruction for the day as it provided space for interns to refresh in their minds the plans for the day. Once on campus, interns used the time to touch base with cooperating teachers, review plans for the day and to finish getting materials prepared for classes. As will be discussed in the section that follows, time between the bells provided moments when coteachers discussed their classes and their practice, or scrambled to wrap-up a class or set-up for the next one (Fieldnotes, Interviews).


**Coteaching**

Within cotaught classes all teachers assume shared responsibility (*co-responsibility*) for student learning (Scantlebury, Gallo-Fox, & Wassell, 2008; Tobin, 2006). What this looks like in practice can assume many different configurations (Bacharach, Heck, & Dahlberg, 2008; Carlisle, 2009). One coteacher may lead the class with others contributing from the periphery. In these instances, teachers shift in and out of lead roles while others provide teaching and managerial support from the periphery and check in with students for student understanding.

Coteaching afforded many opportunities for colleagues to learn from one another *in-situ*. As discussed in this section, by teaching “at the elbow of another” (Roth and Tobin, 2001) the coteachers’ practices became tightly interwoven and provided opportunities for participants to observe one another interacting in the classroom. It is argued that these observations were used to inform future practice, and supported the development of shared repertoires and practices.

The strongest examples of coteaching that I observed at Biden High were marked by a fluidity and coherence that I have only located once in the literature. As Roth et al. (2005) describe, “the actions of [the coteachers] were so coordinated that they functioned as a collective teacher, with a synergistic effect rather than merely the sum of their actions” (p. 676). In these instances, instruction and behaviors of all coteachers were tightly integrated and cohesive. I call such practice “interwoven practice” to portray the essence of such teaching as tightly integrated and overlapping. The example from the
data below illustrates how three Environmental Science coteachers’ practice was interwoven during a lesson about the formation of fossil fuels.

Vincent [cooperating teacher] started to wrap up the activity…. Vincent said to the group, “Okay, what order do you think these materials were formed in? Put numbers in your chart to indicate what order you think they came in?” Luke [intern] then moved up to the front of the room and repeated, “Okay, what order do you think they came in?” Vincent used the power point slide to list the order that they were formed in. Javier [intern] then picked up the discussion and spoke about peat while writing on the overhead transparency. A student asks if these are something they should take notes about. Javier indicates, “This is definitely something you want to write down.” ….They moved on to the next power point slide and Vincent explained the information about lignite. The students took notes on that. Luke picked up for the next slide about bituminous coal. He stood over on the side of the room and referring to the slide as he gave the notes; he continued the discussion talking about anthracite coal. I think this point in the lesson was their best discussion in terms of sharing the floor and going back and forth. They really slid in and out in terms of who was leading the conversation, who was talking about the point of focus. Vincent was shifting the slides as they went along. I felt like the floor was shared equally by the coteachers, and they all took responsibility for what was going on. (Fieldnotes: Environmental Science, Cotaught-Javier, Luke, Vincent, 2/24/05)

Particular to coteaching practice is the on-going interactions exchanges about practice in-situ. These interactions include both verbal and non-verbal exchanges including the mutual, shared practice in the classroom and frequent exchanges about the progressing lesson. Interns and cooperating teachers reported that a valuable part of coteaching was that they were able to observe others in practice (Interviews, Fieldnotes). As Sean [intern] described in his final interview, “You see what they [your coteachers] do and then you can also like change to kind-of mimic them, or like just take what you think is good from them and then change it into what you’re doing” (Sean, Interview, 5/20/05). Luke also talked about how coteaching provided valuable opportunities to observe others in practice.
I feel like I learned more in my co-teaching classes than I did in my solo…. because not only did I get to teach but I got to observe…. for one thing, you simply learn more about the content. I learned so much from Anne and Vincent both—like little interesting facts, or things like that about different aspects of what we were teaching. Sometimes I found myself almost like—I went into student mode…And I had to like snap out of it and say, “Who’s the teacher?” [Laughing] So, just simple things like that. But then at the same time modeling how they interacted with students, and learning about how they interacted calling parents and stuff like that. I really feel like—there are certain benefits to doing things on your own—to actually teaching, and there’s a lot of benefits to observing, too. So, in co-teaching you get both at the same time, (Interview, 5/24/05)

Furthermore, interns remarked that they incorporated practices of others into their own instruction and drew on observations from classes earlier in the day as they repeated a class later in the day (Fieldnotes; Interviews). Cooperating teachers also remarked that they drew on observations made during coteaching to inform future practice (Interviews). Across the semester, coteachers remarked that it was valuable to compare and contrast different colleagues’ approaches toward practice.

Coteaching relationships were mutually beneficial. As coteachers worked together, they learned practices from one another and even changed the ways that they were approaching instruction mid-stream. The example below is from the Environmental Science fossil fuel class cotaught by Javier, Luke, and Vincent and excerpted above. At this point in the lesson, students were working in groups to examine coal in its various stages of formation. Javier was at the center of instruction. His use of focused questions to support student observations served as a model for Luke (another intern) who later on in the lesson also began asking students questions about their observations. As is illustrated below, a noted shift occurred in Luke’s practice over the course of the activity.
This example illustrates how coteachers teach and learn together and how through these experiences practices can shift while working alongside others.

Javier is the lead person he is overseeing the movement of materials from group to group and is asking students about what they are observing. Some of the questions I hear him asking are, "How shiny is it? Is it hard? Is it heavy? How does this material compare to the peat?" He also asks questions later on like, "Did you get the peat yet? Have you looked at the anthracite?" He is trying to keep track of who has had which materials. Luke is also circulating around, but he is not taking the same type of role as Javier. Javier has been bending down and getting in with the groups and talking with the kids. Luke is circulating and peering at the groups working not really asking questions to help focus them. I noticed by the third time of switching materials that he is starting to get into it and starting to lean over the tables and talk to the group, however the questions he asks are different than those of Javier's. Some of them are interpersonal—i.e. "Are you feeling better?" Then he also asks, "Have you guys gotten to see this material or not?" As the activity goes on, Luke seems to be getting a little more comfortable with the interactions and starting to get more involved, although he never gets to the same degree as Javier, but I do hear him start to ask questions like, "Is this shiny? Is it hard?" — Sort-of mirroring some of these questions that Javier had been asking. (Fieldnotes, Environmental Science period 3, Javier, Luke, Vincent Coteaching, 2/24/05)

As coteachers taught together they developed shared repertoires (Lave & Wenger, 1991) of practice. Lave and Wenger describe shared repertoires as "routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions or concepts that the community has produced or adopted in the course of its existence, and which have become part of its practice" (p. 83). Shared repertoires are indicators of the existence of a community of practice (Lave & Wenger). Roth and Tobin (Roth, 2005; Roth, Tobin, Carambo, & Dalland, 2005) have described the coordination of coteacher actions as 'becoming like the other'. They also illustrate how the resources and actions of one coteacher provides structures that support the practice of other coteachers while the teachers work collaboratively. Roth and colleagues describe these developments as
occurring both consciously and unconsciously. While their work seeks to describe the unconscious developments of practice through coteaching, I use the multiple examples in this section to illustrate the shared repertoires and shared practices of coteachers in order to support my argument that this group of coteachers formed a coteaching community of practice.

Classroom observations revealed numerous instances where coteachers shared practices, routines, movements, and meaning. The examples that follow draw from fieldnotes across the semester and various classrooms and illustrate ways that coteachers’ practices reflected each other in action and thought. The first two examples provide examples of coordinated practice, the third shows how coteachers were on the same “wavelength” and could communicate the use of a single word.

Samantha [intern] kept on answering questions. She, at one point, is talking about the movement of the myocin heads and is moving her arms to demonstrate movement. This is something that I actually saw Patsy [cooperating teacher] do a couple of minutes later when she was reinforcing this idea over on the side of the room. (Fieldnotes: Patsy and Samantha Coteaching, Anatomy & Physiology, 3/03/05)

10:01 AM, Bernadette [intern] has been circulating from table to table for much of this lesson... I hear her voice, but can't see her.... She is crouched down at the end of one table in the front far corner (window side) of the room. She pops up and continues talking to the students. Then she moves on and goes to the front center table to help a female student... Both coteachers are circulating around the room helping students. It seems that they mostly go over to tables when kids flag them down and ask a question. When they finish with one group they check out the progress at other tables and move slowly around the room, until another student "grabs" them. 10:08 AM.... I can't see Anne [cooperating teacher]. I find her crouched at the front side table where I had previously found Bernadette. She is helping a student. 10:10 AM, Bernadette finishes up with a student and goes across the room to another table to talk to a student who has raised her hand. (Fieldnotes: Anne and Bernadette Coteaching, Coor II, Period 3, Topic - Chemistry, 5/03/05)
After the student leaves, Luke puts his backpack on the back lab table. Bernadette meets him at the lab table. They look at each other and they say, "Rubric." Bernadette picks up a stack of papers and then moves off to another part of the room. (Fieldnotes: Anne, Luke, and Bernadette Coteaching, Bio/Forensics, Period 1, 3/14/05)

The first two examples provide illustrations of ways that coteachers’ practices were aligned and coordinated. Roth, Tobin, Carambo, and Dalland (2005) have also written about how coteachers practices can become synchronized and adapt similar mannerisms. Through micro-analysis of voice they have even found that coteachers’ vocal inflections in their delivery of material become tightly synchronized. Although this study’s analysis does not move to the micro-level, evidence shows that alignment of practice and learning from one another was not unidirectional, that is only from the cooperating teacher to the intern. Rather, data show that cooperating teachers reported learning practices and repertoires from the interns, and that interns positively reinforced reform-oriented practices for the cooperating teachers (see also Gallo-Fox, Wassell, & Scantlebury, Submitted).

However, as Lave and Wenger (1991) describe, not all learning that occurs within communities of practice is ideal. They and Gee (1992, 1996) both note how cultural communities are actually the main sites for reproduction of bad practices, stances and ideologies—i.e. prejudice. The example from a sequence of Chemistry courses illustrates how weak practices can be reproduced, or supported within a coteaching community of practice.

When I got to the classroom, the coteachers were handing back a whole bunch of sheets, and they started reviewing the test. Tim [cooperating teacher] was up in
The front of the room looking at the test. He was basically reading the test aloud and rambling along—moving through the answers at a pretty quick pace. He explained things as he went along, but he just kind-of stood there in the front of the room with the paper in his hand, he mostly looked at the paper and did not even look up a lot. Amanda [intern] was at the side of the class over by the teacher's desk looking on. (Field Notes: Amanda & Tim, Coteaching, period 5, Coor II – Honors Chem, 3/08/05)

As I noted in an analytical memo while I was coding “Tim was not much more animated than the Joe and Amanda are when they do reviews. He might have even been less animated than Amanda!” (HyperResearch ®, Annotated Memo, 2/27/07). I observed Amanda solo teaching the same course later that day during period 7. Like Tim, Amanda was reviewing the test. As I observed Amanda I was struck by the marked similarities between the way she was teaching and what I had observed earlier in the day. As I wrote in my fieldnotes,

I was struck by how much this class reminded me of the period 5 that I had seen earlier. I guess that should not really surprise me because it is the same course… What surprised me was that before Tim had delivered the instruction—this time, it was Amanda who was teaching. Tim was out of the room, and Amanda was using the EXACT same examples standing in the exact same… place as Tim … and she was going over the examples using many of the same words. To me, it seemed like déjà vu. It felt like I was sitting in on the same lecture, hearing the same conversations, but just that there was a different person delivering it. Amanda had her own mannerisms involved— her casual way of walking and her smile, but it was the same. I mean, it was so much the same, and it just really blew me away. [Even the way she phrased things] at one point, she said “do not let scientific notation be what throws you”. [Tim had said the same thing earlier in the day.] She talked quickly and sort-of mumbled. This is Amanda’s delivery style, yet I also have in my notes from earlier that Tim is also a mumbler, and he had kind-of stood up there and just yammered on. (Fieldnotes: Amanda, Solo, Honors CoorII (Chemistry), 3/08/05)

Roth, Tobin, Carambo, and Dalland (2005) also warned of the potential negative implications of coteaching and the power of appropriating collective practice writing:
Coteaching harbors the danger that participants appropriate practices that might be regarded as undesirable. That is, our research suggests that if new science teachers are paired in their practicum with teachers who are not appropriate role models, they are likely to pick up practices—including inappropriate discourse of science content—that is not desirable. (p. 700)

Gee (1992, 1996) in his discussion of membership and the development of cultural Discourse, has also described this phenomenon explaining that when one develops the Discourse of a community it becomes very difficult if not impossible to critique or operate outside of it. While Roth and colleagues’ writing frames the cooperating teacher’s influence over interns as unidirectional, what I describe in this section is a multi-directional process. Cooperating teachers influence interns, however, interns also influence each one another and also their cooperating teachers (see also Gallo-Fox, Wassell, & Scantlebury, Submitted). For the most part this was a positive learning experience and a way to enhance and support reform-oriented practice. Darling-Hammond in her discussion of 21st-century teacher education calls for the development of collaborative clinical models where the school settings are strengthened through work with student teachers. While PDS models are typically cited as providing such potential, data in this section suggest that coteaching may also be an approach for strengthening cooperating teacher practice.

These findings are important to recognize, because even in instances where preservice teachers work with exemplary cooperating teachers, the cooperating teacher’s perspectives have been found to overpower the preservice teacher (E. R. Smith, 2005). So powerful can be the persuasive power of cooperating teacher and the culture of the teaching community (Featherstone, Gregorich, Niesz, & Young, 1993) that field
experiences have been found to “wash-out” the learning of theory at the University level (Zeichner & Tabanick, 1981). Data suggests, however, that the cohort model for learning to teach provides support structures that can help to counteract the strong influence of cooperating teachers and help interns maintain commitment to theories taught in the University setting. For example, Bernadette and Luke [interns] both cotaught Biology/Forensics with Anne (cooperating teacher). Anne was a strong cooperating teacher with a clear commitment to traditional teacher-centered instruction and sought to keep her practice closely aligned to previous years. Working together Bernadette and Luke sought to incorporate inquiry-oriented instructional practices and reform-oriented pedagogies into their daily practice. Though they frequently felt disempowered on these fronts, their mutual commitment to these pedagogies, along with consistent support from their supervisor and contrasting coteaching experiences with Vincent, enabled them to remain strongly committed to these pedagogies (Fieldnotes; Interviews). In fact, during his first year of teaching Environmental Science in his own classroom, Luke worked with his students to build a small estuary around a small pond on the school grounds that they returned to and drew on as part of their ongoing curriculum (Luke Interview, Fall 2005). This example provides one of many ways that interns were able to sustain commitments to theories taught in the University teacher education context despite contradictory practices and belief structures of their cooperating teacher.

Coteaching supported the development of reflexive practice through the on-going opportunities for teachers to dialogue about their evolving practice as it was occurring. This provides marked contrast to traditional models for student teaching where preservice
teachers are observed teaching and then provided feedback after class, or in instances where they are not observed and must relay classroom experiences to cooperating teachers or supervisors after the class is over. In contrast, coteachers typically supported each others’ practice while they taught together by inserting additional ideas and comments into instruction to help inform student understanding, providing different explanations of material, or adding to the content information shared within the classroom. *Huddles* (Tobin, 2006; Wassell, 2004) provided coteachers with space to talk about the dynamic unfolding of practice “in the moment.” Throughout the instructional period, coteachers briefly gathered and verbalized what was occurring in the moment. Coteachers then problem-solved and made quick decisions about the next direction for instruction. These *in-situ* reflections on practice provided space for teachers to fine-tune evolving practice, deliberate about next steps, coordinate practice, and also share insight about student understanding. As huddles dispersed, coteachers typically moved into action. Often their behaviors indicated a shift in direction from what had occurred in practice just before the coteacher huddle and reflected a decision that had been made within the huddle (Fieldnotes). These practices supported intern’s ability to make mid-stream assessments of practice and learn to adjust their plans for practice as an ongoing part of their instruction (Interviews). The fieldnote below illustrates a quick huddle between two interns Javier and Luke. Here they use the huddle to shift roles in classroom instruction and confer about which material to cover during the last minutes of class.

*Luke finished up what he was talking about. He went over to Javier who was at the side of the room by the computer. There was a 2-second huddle or exchange. I heard Luke say, “You want to go?” They talked for a second, and I heard Luke say, “I don’t think we’re going to have time for that.” As those words were*
coming out of Luke's mouth, Javier took a step and did a sweep across the center of the classroom and picked it up where Luke had left off—he's talking about recycling. (Fieldnotes: Javier and Luke Coteaching, Vincent absent, Environmental Science, period 3, 4/14/05)

Plans for practice were developed in coplanning meetings, formalized as written documents and submitted each week as lesson plans then further developed during huddles and ongoing teacher exchanges in practice as coteachers collectively enacted and constructed their plans. Coteaching incorporated multiple participants involved in layered actions, discourse, and frequent mid-stream adjustments. Within coteaching interns gained access to the cultural practices and repertoires of the community of practice. Through their engagement in the community, interns participated in the routines of the classroom, developed a sense of pacing and timing, worked with students in whole groups, small groups and independently, and also worked to check on and expand upon student understanding of material. Additionally, coteachers received support in practice and opportunities to focus on specific aspects of teaching instead of being responsible for all aspects of practice at one time. As Patsy, one of the cooperating teachers explained, she felt this experience afforded interns with opportunities to focus on teaching students in a way that they would not have been able to do had they only solo taught. She remarked,

That’s why I like the co-teaching. You can focus more on—How can I teach this to the kids? —More on different teaching strategies, and they’re not worrying just about behavior, because there is somebody else in the room to help with that. When you’re totally soloing all day, you can just spend way too much time doing the classroom management stuff and not enough time really getting the opportunity to really teach. (Patsy, Interview, 6/07/08)
The section that follows examines the solo teaching experience that each of the interns participated in as a part of their regular day. It highlights tensions between the solo component and views of teachers as independent practitioners and experience within the coteaching community of practice that situated practice as a mutual collaborative construction.

Solos

Each intern taught one solo class period per day. Community members called these independent class periods, “Solos” (Fieldnotes; Interviews; Meeting Transcripts). Their use of this term is reflected throughout the dissertation. Solo teaching experiences provided markedly different from coteaching experiences because like traditional student teaching experiences, solo classes were typically taught independently. This reflected a model of student teaching where the preservice teachers independently assume control of classroom instruction. As will be discussed in this section, despite the fact that interns generally aligned solo class instruction with their cotaught classes, the cooperating teachers and interns highly valued the solo teaching experience, which they believed provided opportunities for classroom independence and opportunities to develop individual teaching voices. Additionally, the juxtaposition of the coteaching and solo teaching experiences highlights a tension between the goals of practicum experiences and the ways that they prepared preservice teachers for later independent classroom practice.

Courses that the interns taught independently were also classes that they cotaught with other coteachers earlier in the day. Unlike traditional student teaching experiences,
however, the interns were not expected to spend a set amount of time observing their cooperating teacher from the side of the classroom prior to taking over classroom instruction. Interns assumed full responsibility of their solo class as soon as they felt comfortable. Cooperating teachers tried to leave the classroom space as quickly as possible in the semester in order to help interns establish themselves as the classroom teacher (Fieldnotes, 2/22/05). Javier and Julie took over their solo classes in the first week of the practicum experience; by the 3rd week of the semester most of the interns had taken over their solo classes (Interviews; Seminar transcript, 2/22/05). Once interns took over their solo class, they were responsible for classroom preparation, instruction, and student grades for these classes for the rest of the coteaching semester. Some interns assumed all interactions with parents over the phone and email; other interns addressed these responsibilities with the support of their cooperating teacher. Once interns were established as lead instructors for the solo class, coteachers often worked on the periphery of the classroom, occasionally inserting ideas or providing support for the lesson as it was warranted (Fieldnotes; Interviews).

Despite being independently responsible for solo classes, interns tended to keep instruction closely aligned to cotaught classes, this provided support for their independent practice (Fieldnotes; Interviews). Like traditional student teaching experiences (McIntyre, Byrd, & Foxx, 1996), fieldnotes document that interns tended to focus on content delivery and classroom management during their solo classes. However, interns also incorporated many of the culturally-valued practices such as reform-oriented science, mixed pedagogies, and small group work when it was supported by the coplanning
process and corresponding cotaught lessons. Due to their primary role in solo courses, interns appeared to have less time to focus on individual student needs and to check in with students for understanding than they did when coteaching (Fieldnotes). As Samantha explained,

> When I really started to take on my class — the solo class... it was just so much harder. I enjoyed it ... [but] I couldn't give as much attention to certain students as I wanted to. There are two students in the back... and they need a lot of help, and at the end I just couldn't give them all my attention... But it really bothered me that when I'm in my solo that I can't give all my attention to everybody. The class is just too big, and you can't run it then. You're just all over the place. Pasty would say that to me... [She] would be like, “Samantha you can't— Don't feel bad if you don’t answer everybody’s questions... You can’t just go off and speak with him, because then everybody else gets off task.” And I knew that, but it’s just hard learning how to do sixty million things at one time and make 20 million decisions in a matter of a couple of seconds. That was hard. With the co-teaching it was never like that. I felt like I was just so much more involved with the kids. (Interview, 5/20/05)

Amanda also suggested that there were distinct differences between the solo experience and cotaught ones. She emphasized that she felt that the solo was important for learning how to manage the classroom and multi-task multiple activities at once.

> It would be nice to get more than one solo period. I think that’s definitely helpful just because you don’t have someone at the ready with the papers that you’re going to hand out, or reminding you to remind them about the quiz in two days, or just having someone, having two minds working on the same project as opposed to having only yourself. I mean, that’s what it’s going to be, all you, come September. So it’s a matter of making sure you can multi-task whereas with the co-teaching you had someone helping you multi-task. (Interview, 5/25/05)

The comments by both Samantha and Amanda about the differences between the coteaching and solo teaching experiences suggest that how the interns participate within each context may differ. As Lave and Wenger have argued, “learning occurs through participation.” These different types of participation have implications regarding what it
is that the interns learn in the coteaching and the solo teaching experiences. This highlights a tension regarding intended outcomes of the full practicum experience. Should the goal be learning to juggle the multiple tasks of the classroom independently and learning how to balance whole class needs versus individual student needs? Or, rather should the goal of the instructional experience include becoming attuned to individual student needs and learning how to address student needs in practice, while also learning to examine, reflect on and improve practice? Solo teaching data suggest that while the interns gained multiple learning experiences, some interns, such as Amanda valued the solo because she believed it prepared her for teaching in ways aligned with the cultural myth of practice as the rugged classroom teacher who has tight control of all aspects of the classroom (Britzman, 1991). She and many of the other practitioners viewed this as the type of preparation that they needed for future years in their own classrooms (Interviews). Research by Bullough and colleagues (Bullough et al., 2003; Bullough et al., 2002) on the use of paired placements for full practicum experiences also found this tension between the goals of preparation for individualized practice and the opportunities for reconceptualizing the outcomes of the experience through paired placements. They suggest, however, that having multiple teachers in the classroom provides unique learning experiences that can benefit future independent teacher practice. In the paragraphs that follow, further data is presented that illustrates how the solo experience aligned with traditional outcomes of student teaching experiences.

Coteachers viewed the solo as a space for interns to develop their own voice and style as a teacher (Fieldnotes; Interviews). It was also a place to try out, new techniques,
practices and instructional approaches, different forms of assessment, experiment in practice, or deviate from the mutually agreed upon approaches used in cotaught classes (Fieldnotes; Interviews). Early in the semester three out of the five cooperating teachers involved with solo periods told interns that they had had the flexibility to change instructional plans from the cotaught lesson plans during solos. For example, they could substitute different material, address different concepts, or utilize different pedagogies, activities, or assessments for their solo class. As Patsy stated in a coplanning meeting the 3rd week of the semester, “You are allowed to go off and to do different things in your solo if you are not comfortable with [the plans we make]” (Anatomy and Physiology coplanning transcript, 2/17/05). As I wrote in my fieldnotes that day,

*I do not remember anyone doing things differently during their solo periods last year. I’ll be interested to see if Samantha actually takes Patsy up on that, or if she sticks to doing things the same way. I thought it was nice of Patsy to offer that as an option. (Fieldnotes, 2/17/05)*

Of those who worked with the three cooperating teachers who opened up the possibilities for individualization during solos, Bernadette, Julie, and Samantha were the interns who most frequently brought in additional ideas and pedagogies into their solo classes. In opening up the solo as an independent space for experimentation and individualization, interns were provided a venue for teaching in ways that they felt best addressed student needs without asking for their cooperating teacher’s permission before deviating from practice. This opened up space for intern voice and negotiation of practice in a way that

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7 Javier and Luke also worked with these cooperating teachers, but were more likely to align their solo instruction with lesson plans from cotaught lessons. Amanda, Joe, and Sean worked with different cooperating teachers for their solos, they tended to keep their solo practice tightly aligned with cotaught plans.
differs from more traditional models of student teaching where the expertise of the cooperating teacher has been found to influence a student teachers’ pedagogical practices (E. R. Smith, 2007).

The solo class was a part of the coteaching model because both Pam (the science department chair at BHS) and O’Brien, the clinical supervisor, felt that preservice teachers needed to develop classroom management skills and demonstrate that they could manage a classroom by themselves during a student teaching experience (Pam Interview, 10/23/05; O’Brien Interview, 2/10/04; Claire Interview, 11/12/03). As Claire explained in an interview prior to the implementation of coteaching in 2003,

Pam was more adamant about it than I was, and I think O’Brien would be even more so — That they [interns] will have to have experiences when they are the only teacher in the room, because that’s the reality of what it will be like when they start teaching”. [Later in the interview she added] “The first year [of teaching] is going to be hard no matter what they have during student teaching. So I didn’t necessarily see a need for them to solo per say. Pam felt that they should because that’s the real world of teaching. (Interview, 11/12/03)

The practitioners’ emphasis on the importance of independent classroom practice led Claire to include the solo class period as part of the coteaching model. Throughout the coteaching semester, the cooperating teachers and interns all emphasized the importance of the solo part of the experience with many of them expressing that they wished the interns had two solo classes (Fieldnotes; Interviews). It was clear that all practitioners involved in the program (cooperating teachers, supervisors and interns) valued the solo teaching period and viewed it as a space for independent classroom responsibility. Practitioners viewed the solo teaching experience as a “proving ground” (Interviews: cooperating teachers, supervisors, interns) and in their final interviews, interns
consistently identified the solo as a key place where they developed confidence in themselves as teachers. As Julie explained,

When I took over that classroom [solo class] with the chem unit and pretty much it was all me. And realizing that, for myself, “Yeah I am capable of this. I can do this.” Because I was really questioning, “Like, how on earth am I ever going to teach my own classroom?” And then I got that opportunity to do that whole unit by myself. I was like, “I can do it! Oh, my gosh!” It was really, I don’t know—empowering I guess, in a way to learn that. That was really great. (Julie Interview, 5/23/05)

Perceptions of the solo that emphasized the independent, autonomous teacher align with traditional views of classroom teachers. Britzman argues that such views can be problematic as they can limit preservice teachers’ ability to negotiate and talk about the complexities and uncertainties of practice and reinforce conceptions of the individual teacher as a rugged individualist who is an expert and in control of the classroom (Britzman, 1991; Florio-Ruane & Smith, 2004); these images contradict with current conceptions of teachers work within reform-oriented learning contexts which emphasize the value of collaboration and learning in community with colleagues (Darling-Hammond & Sykes, 1999). Ironically, views of teaching as independent as valued by the teachers in this study and reinforced by the solo experience were in marked contrast to the rest of the coteaching experience which centered in collaboration and the ongoing process of interactions around and within practice. Despite this contradiction, all of the teachers valued the coteaching experience. In fact when asked, “Do you feel that you missed out on anything because of coteaching?” interns’ uniform and resounding response was, “No” (Intern, Interviews, 5/05).
The bell rings it’s the end the class… [and] you just have those six minutes of packing time just to “Ooooo” breathe and decompress and be like, “Okay, that really didn’t work, or that was great.” Or take the managerial steps — All the students coming up to you, and any late work or whatever crap like that. Most of the time, Pam and I would be like, “Well, that was good.” Or Joe and I would talk a little bit on the side kind-of like, “Okay, do this, this, and this, or whatever.”

With my solo seventh period especially — because I was coming from downstairs… half of the class had beat me to the classroom and was waiting to
hand stuff into me, or ask me questions, or whatever like that. So, all of that little managerial [stuff], you know—“Okay who was absent? Here’s what you missed. Okay, you have an excused absence. Let me write it down.” All of that little stuff spilled over into the start of class…. Just having that six minutes was crucial to really being organized…. it is like, “Oh, my God. Gotta finish grading all those things, and give them to Pam.” And then get everything together, run upstairs, and get everything together for seventh period. (052505 Amanda interview)

Coteaching as a recursive process:
Coteachers’ experience informs future members’ instruction

As Amanda’s quote above describes, the coteachers squeezed many activities into the time between the bells. In addition to wrapping up one course and gearing up for the next class, coteachers shared snippets of talk about the classes that they had taught or were going to teach, as well as the on-going shifts in practice that occurred across the day. While formal lesson plans were submitted on Sunday, what actually happened in instruction changed as the day and week evolved (Fieldnotes). After a lesson plan was taught once the successive classes were shaped by the ones that proceeded them (Interviews, Fieldnotes). As Sean explained,

For the most part what happened period 5 really shaped what we [Henry, Samantha and Sean] did period 7. So it's also like what we [Joan, Patsy, Samantha, and Sean] did period 1 shaped what Patsy and I did in period 4; and I'm sure that shaped what they did in period 3 and then period 5. I'm sure that's always like that. You know? What you do in one class shapes what's in the other. (Sean interview, May 20, 2005)

Because different coteachers taught the same course across the day, lessons learned in practice were relayed from one coteacher to the next. Interns passed information along to each other about instruction including: how things went, problems found around instructional materials, or feedback about the pacing and timing of the lesson such as whether or not they had enough, or too little planned. Coteachers shared observations
from practice which included lessons learned, student responses to instruction, and adjustments made to their plans. They even shared information about group dynamics and coteacher’s moods in order warn each other when they needed to tread lightly (Interviews; Fieldnotes). Information shared was used to help each other succeed in the classroom, to support the students’ learning experience, and to coordinate and synchronize class periods. Coteachers talked about what they learned in practice and adjustments made to lesson plans throughout the day — when interns passed each other in the hallway between the bells, while packing up and arriving in the next room, during prep time, lunch time, and at the end of the day (Fieldnotes, Interviews). These exchanges reflect some of the Discourses of the coteaching community and the reflective practices that the coteachers used to shape their practice and that of their coteachers. Evidence shows the supportive nature of the community with participants passing on information gleaned from practice to help colleagues. Furthermore, it shows the ways that these types of communications made teacher thinking public through the sharing of experience.

**Preps**

In order to maximize the interns’ planning time with their multiple coteachers, interns’ preparation periods coincided with their cooperating teachers whenever possible. Once a week, four of the coteaching groups regularly coplanned during their common planning time. However, for the rest of the week prep periods were flexible (typically self-directed) with a focus on the work of the day and classroom needs. Interns moved
freely about the school during preparation periods going in and out of coteaching classrooms, touching base with coteachers, going into the faculty spaces, getting chemicals out of the chemical supply closet or materials from the departmental storage room and bookroom, and in and out of administrative offices as necessary. Depending on the period interns worked alone, with coteachers, or alongside others on their own work. When their classrooms were not being used for instruction, coteachers frequently worked there, but they also utilized other available spaces throughout the high school (e.g. the faculty lounge or the periphery of classrooms that colleagues were teaching in). Sometimes, typically during period 2 and 6 interns gathered in the faculty lounge making copies, working at the central table, or side-by-side on a bank of school computers — cooperating teachers sometimes joined them here. Interns who worked in the faculty lounge frequently did not teach together during the day and sometimes only saw each other during prep or lunch. However, these interns took advantage of this time with other content specialists to garner support for instruction. For example, on 5/03/05 as Bernadette (Biology intern) prepared for her upcoming chemistry lesson in Coordinated Science II, she consulted with Joe (Chemistry intern) about how to teach conservation of matter and how to pronounce a chemist’s name while he worked on grading (Fieldnotes: Period 2, Faculty Lounge).

Prep periods were typically busy times for getting caught up on work, and preparing for upcoming classes (Fieldnotes). It seemed that part of each preparation periods was spent grading. However, the coteachers also participated in many other activities that were relevant to classroom instruction, student assessment, and curriculum
development. During prep periods coteachers also talked about classroom events from the day, shared ideas and stories about students, and talked about life, decisions, and the job hunt.

Interns and cooperating teachers often shared the room working alongside each other on various activities. For example, on 4/21/05 I observed Amanda preparing chemical solutions for a lab that her students would be working on, while Joe and Tim developed questions for an upcoming test. During preparation periods Chemistry interns often set-up or cleaned up chemicals from laboratories. Other interns also set-up labs, and prepared hands-on activities or demonstrations as appropriate for their disciplinary area. When there was time, interns also tested out activities or labs—occasionally trouble shooting before trying activities with students (Fieldnotes, per 4a, 4/18/05). Coteachers also used the time to review problems for class and check in with each other. For example, on 4/20/05 Samantha found Sean to review a di-hybrid cross problem (2-factor cross) for their genetics unit that she kept solving incorrectly. The two interns worked together to solve the problem before their up-coming lesson. Occasionally, interns also spent the period observing others teach lessons that they would be doing later in the day or week (Fieldnotes, 4/28/05), or helping out cooperating teachers who needed additional

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8 For example, interns set up for their next class, prepared notes, power point presentations and worksheets for class; figured out which materials were needed for upcoming classes, made Xerox copies, gathered supplies and materials for instruction, fed classroom pets, swapped out class sets of textbooks between units (the Coor II classes shared textbooks), debriefed with coteachers about past lessons and collectively reviewed plans for upcoming classes or adjustments made to lesson plans, talked about student progress, previewed videos, entering grades and attendance, created materials for classes, located and learned how to use equipment for class, consulted with others about instruction, talked about IEP meetings, and cleaned desks.
support for a lab or new activity that they were doing with their class (Fieldnotes, 5/06/05, 5/11/05; Interviews).

Like lunchtime, which is discussed in the section that follows, preparation periods provided coteachers with time outside of instruction to participate in the activities of the community and shape their identities within the community of practice. Prep periods provided interns with additional time to focus on the work of the classroom and interact with colleagues about their work. In summary, preparation periods were generally a busy part of the day for dealing with the crush of work. Though interns had twice as many preps as their cooperating teachers, they were typically very busy addressing instructional needs and teaching demands, and connecting with coteachers or working alongside them on the tasks of practice.

**Lunch**

Cooperating teachers ate their lunch in one of three different settings. Five of cooperating teachers ate lunch in their classrooms: two ate independently while working, and three of them ate with one other teacher. Anne ate lunch in the faculty lounge with teachers from other departments. Vincent and Tim along with a couple of other male teachers from the school ate lunch in Vincent’s room, and socialized and watched television during their lunch period. At the beginning of the semester, interns tended to eat lunch with their cooperating teachers joining their lunchtime practices. However, by the end of the semester most of the interns had shifted lunchtime practices and joined the collective in Vincent’s classroom.
At the beginning of the year, many of the interns ate lunch in the faculty lounge where they joined the veteran teachers around the main table. In early March, I joined Anne (cooperating teacher), Bernadette, Joe, and Samantha (interns) in the faculty lounge and was surprised when the veteran teachers, representing various departments across the high school, spent the majority of lunchtime complaining. I wrote,

*There were a lot of different things going on during the conversation and I did not catch it all. Grant and Betty were complaining about the copier not working—it had not been working since last Thursday. There was a program from the [school] play on the table. Grant picked it up and he said, "This is why it [the copier] is broken; they were running that off." Then he and the whiney teachers complained about how students are being excused for dress rehearsal and how they are not really excused from their class and they mark them as unexcused absences and the kids come and say, "But I was excused." And they say, "But you never came in to class check in with me." The teachers are very upset about this. [A couple minutes later...] Then Anne started talking about a SMART Board™ and the teachers started complaining about how the only SMART Board™ in the district is in the district office. Why would they get a SMART Board™ when we really need it at the high school?… (Fieldnotes, 3/08/05)*

As the semester progressed, the interns began to reject the faculty lounge and one-by-one began to join Luke and Javier and the rest of the lunch group in Vincent’s room. As Joe explained,

*I started to eat in the teacher’s room because the other teachers were in there. I think it started out like me and Samantha, Sean, Bernadette, and some of the other teachers. But all the other teachers would do is complain about their students and stuff like that. And I just—I didn’t feel like being around that so much. So I just started eating lunch in Vincent’s room with those guys, because they’re more fun. [Laughs] And then Bernadette followed me in there. (Interview, 5/24/05)*

Over the course of the semester each of the interns joined the lunch group in Vincent’s room at least a couple of times, with most of them becoming regulars by the end of the semester. The lunch group in Vincent’s room was a consistent group of male faculty
teachers who gathered to enjoy their lunch break together, relax, and watch movies or television shows. The group had an unwritten understanding about not talking shop and not complaining. Vincent and I had discussed the origin of the lunch group and their rules during an interview the year before,

_We have rules…. well, we have an understanding ... three years ago there was a group of us, we would come and eat lunch in one of the productivity rooms and sit down. There's a core of older teachers who just sit down and complain, and talk bad about students, or talk about how they hate that this has happened. And that’s not what I want to do with my sanity time… I want to have fun. I want to talk about things. I want to relax, and I don't want to be made to feel apprehensive about my job, or about what kids do…. So we got together and said, “Hey, we just need to get together and have fun. We'll bring in a movie. We'll watch twenty minutes of it. We don’t care; we’ll finish it when we finish it. And rule number one is we have fun. Rule number two is we don’t talk about school…” On occasion we’ll talk about [coaching], but none of the academic stuff and no complaining. No bitching and complaining, because twenty-five minutes is short enough, and I don't want to spend it complaining. So, we just sit back and talk, and we usually watch comedy or some type of action. (Vincent, Interview, May 2004)_

Being able to participate in these differing lunch time contexts provided interns with contrasting perspectives about ways the veteran teachers constructed their time and identities as professional participants within communities of teachers. Lave and Wenger (1991) explain that legitimate peripheral participation of newcomers in the talk and stories of the community provides opportunities for newcomers to learn the discourse and stories of practice and learn the mannerisms and discourse of the community. Carter (1993) writes, “Stories, including those told by teachers, are constructions that give a meaning to events and convey a particular sense of experience” (p. 8). Whichever constructions of practice the interns choose to be immersed in posed significant learning opportunities as the interns developed their Discourse (Gee, 1992, 1996) and professional
identities as teachers. As Featherstone, Gregorich, Niesz and Young (1993) illustrated in their study of the student teaching experience, the powers of school culture can strongly influence the ways that new teachers internalize their practice. Furthermore, they found that “even the most committed novices are vulnerable to the staff-room culture of the schools in which they student-teach and teach” (Featherstone, Gregorich, Niesz, & Young, 1993, p. 6). In choosing an alternate lunch site to the staff room, the intern’s shifted their lunchtime context and the constructions of practice that they were immersed in during this time. By extracting themselves from the complaining and negative construction of practice and students, interns made a conscious decision regarding their learning contexts and lunchtime cultural influences about practice that shaped their development and participation within the coteaching community of practice. By choosing this route, this potentially also helped them avoid some of the negative frames of practice noted by the student teachers in Featherstone’s article as the interns became a part of the community and developed their professional identities.

The overarching approach to lunch utilized by the faculty who ate in Vincent’s room became highly valued by the interns who also did not want to listen to the teachers in the staff-room complain throughout their lunchtime. The interns came to value down time during the day and lunchtime as space to relax, refuel with friends, and to take a break from the demands of teaching. Lunch in Vincent’s room was a time that the interns greatly valued and as Luke said,

*And then there's Vincent and just the people that I eat lunch with and everything. I think it's good when teachers can—I think it helps you to stay sane when throughout the day you turn off the teaching once in a while. You know, get that*
out of your head and just talk about and think about things other than school. But you need to know when to do that. (Luke, Interview, 5/24/05)

Interns’ greatly valued this time to relax and unwind in an arena where work took the backseat, and the “camaraderie” and joking of colleagues was preferable (Fieldnotes; Interviews). Additionally, these interns were able to get to know teachers in other departments. This social networking helped them strengthen their connections with the school and expand their practice. For example and Luke used the social connections from lunch to borrow resources (an LCD projector) from the Social Studies department in order to better support instruction in the Environmental Science classes. Interns also began to adapt the stance that lunchtime was a time for relaxing. For example in his final interview Joe explained, “Lunch time, I tried to never do anything, but eat lunch.” This was goal of many for lunch, but the fact of the matter was that work did creep into the lunchtime space.

On many days interns were observed working on the fringe of the classroom, away from the core group of teachers eating lunch and watching movies in the front of the room, either at the back tables or on the computer at the side of the room as they tried to finish up work for an afternoon class or an assignment due that evening for either the Program or their classroom management class. When they sat at the tables eating lunch, Amanda and Julie would often whisper to each other about their morning and take some time to complain about something that had happened (Fieldnotes, Interview Data). This was also a time for networking across content areas. For example, when Julie and Luke (Earth Science/Geology and Biology interns) had to teach a Chemistry unit in their Coor II classes they used lunch time to talk to the Chem interns (Amanda and Joe) about
pedagogical ideas and approaches for the unit (Fieldnotes, Interview data). On rare occasions, there were days when interns stayed out of the Environmental Science room (either in the faculty lounge, or in another classroom) so that they could finish their prep work for the day. As Amanda explained, “I really like that my planning period and my lunch were together. I think that definitely saved me several times, just being able to work through lunch. I was able to just focus on something for a while, or to be able to just relax.” (052505 Amanda Interview). Finally, there were plenty of days where interns would quickly work on wrapping up last minute planning or debriefing with their coteachers at the beginning of lunch and then slide into Vincent’s room for the last fifteen minutes of group lunch.

*Debriefing*

Debriefs were specialized conversations that centered around the process of reflecting on practice and unpacking classroom events. Coteachers regularly debriefed about cotaught classes and interns debriefed about their solo classes by talking about the solo with cooperating teachers. Typically, debriefing sessions followed a similar pattern in which the coteachers reflected on the lesson, often with attention to an aspect of class that had not gone smoothly. Both cooperating teachers and interns problematized classroom experiences. However, interns were more likely to raise concerns about practice as part of the discussion. Conversations in debriefing sessions were typically

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9 Lunch outside of Vincent’s room important also for developing relationships; for example, Patsy, Joan and Samantha became friends. The teachers often provided each other with emotional support, encouragement, and advice (Fieldnotes; Interviews).
multi-directional with all teachers discussing the lesson and what had gone wrong, or well. Group members discussed the coteachers’ collective practice, and did not necessarily focus on only the intern’s practice. Evaluations about intern practice came from both the intern and also the cooperating teacher with discussion frequently reflecting the effectiveness of the lesson or a part of the lesson. These exchanges were not only evaluative, however. Interns typically only talked about their solo class with other teachers outside of class during times such as debriefings, because cooperating teachers usually did not observe solo classes, the interns reflected on the experience and cooperating teachers provided feedback.

Debriefing sessions served as mutually reflective conversations when coteachers reflected on shared experience and talked about ways to extend or improve their practice in the future. As part of debriefing exchanges, cooperating teachers often provided advice or suggestions for addressing problems, and the coteachers would discuss implications for future practice (i.e. how the next day would go, adjustments to be made, or what could be done if the lesson were to be repeated). For example, on 3/3/05 after having difficulties in class with a science lab about population growth Henry, Joe, and Samantha had the following exchange,

*Henry was surprised that there was a problem. He said, "I did not have trouble with this last period. The kids never have any beans to start with. I did not anticipate that this would happen. Last time, the problem was when they got to the second generation."… Samantha also said that she was surprised that once the students got the formula down they did not have a problem with the math. She said, "I was surprised, I did not expect that." And then finally, [they talked] about what to do next time. "I guess next time," someone said, "we will need to make sure we emphasize that you only take 20 of each bean." Henry said something like, "You know, we did not really have enough time to go over this during the class. We ran out of time yesterday or the other day, that probably would have
helped us all know the lab.” (Fieldnotes: Coteaching, Henry, Joe, Samantha, Coor II, period 4)

On another day before a coplanning meeting Amanda and Pam talked about their Advanced Placement Chemistry class. Amanda had taught the lesson, and Pam had observed from the teacher’s desk at the side of the room. As I noted in my fieldnotes,

“Amanda said something like, ‘I have to go over the lesson tomorrow, my explanation was not good.’ Pam then said, ‘Well, actually it was.’ Then they had a nice exchange where they reflected and talked about how the lesson had gone and what kinds of information they had gotten across to the students” (Fieldnotes: Coplanning meeting, Coor III, Period 2, 2/24/05).

Quick debriefings occurred on the run in the quick snippets of time at the end of class, between the bells, and often consisted of quick comments such as, “That went well,” “Or we’ll need to re-teach X tomorrow” (Fieldnotes; Interviews). However debriefings also took place at the end of the day, during preparation periods, during lunch, and during minutes grabbed prior to the beginning of official meetings such as coplanning sessions or Seminar (Fieldnotes). These exchanges were less pressed for time and provided opportunity for longer reflection and examination of practice.

Sanders, Dowson, and Sinclair (2005) in their field study of cooperating teacher and preservice teacher interactions observed over 87 hours of dyad interactions spanning the school day from before school through after-school. They identified the cooperating teacher filling a combination of seven different roles, all of which have been theorized in the research literature as essential elements of cooperating teachers’ work with preservice teachers. The types of interactions that occurred during debriefing sessions at Biden High correspond with both evaluating and conferencing interactions, which Sanders et al. identified as occurring only 15% of the time in their field-studies. The authors found that
such exchanges were typically short, one-sided, and rarely (1% of the time) reached the level of “pedagogical discussion” (p. 723) or “to an analysis and application of the strategies required to address particular difficulties encountered during an evaluation” (p. 729). In contrast to Sanders et al.’s findings, debriefings that occurred during coteaching were multidirectional with interns often critiquing the lesson, or asking for feedback. While quick debriefings did not provide time for extended discussion, longer debriefing sessions frequently incorporated thoughtful conversations about pedagogy and strategies for improving practice in the future.

**On-site Seminar Meetings**

As part of the field experience, interns attended a weekly seminar with program participants. Some of the seminars were held at the University with Claire, the program administrator, and all of the undergraduate secondary science preservice teachers. Five of the seminars were held at Biden High School for participants of this learning community. Cooperating teachers were invited to attend the on-site seminar along with the intern cohort. While not all cooperating teachers attended all of the meetings, all cooperating teachers attended some of the meetings. Biden High School administrators, clinical supervisors, and Claire also attended some of the on-site seminars (Fieldnotes, Attendance records). I facilitated the Seminar meetings at Biden High along with Pam, the Science department chair. We typically followed the framework for on-site seminars set by Claire the year before, although we formalized the process of a round-robin weekly
“check-in” (Little, 2003) were all participants shared a success or an issue from their practice.

The purpose of the on-site seminar was to provide a forum for reflective practice on the teaching and learning of science (Seminar Transcript, 2/22/05). Seminar meetings followed the rules of cogenerative dialogues that emphasized the valuing of all voices and perspectives (LaVan, 2004). Seminars were designed to provide a safe public forum for sharing experiences, talking about how things were going, and collectively examining problems of practice. Each seminar began with an agenda related to the coteaching experience; typically, these were issues common to the coteaching classrooms (i.e. getting to know students, sharing instructional space, and classroom management). Other topics such as goal setting, national conferences, and resources for practice were also addressed. Additionally, a meeting with school administrators provided time to talk about sexual harassment policies and a group mock interview experience (Seminar transcripts). At least one-half of each seminar was dedicated to providing time for community members to talk about what they were doing in their classroom. Coteachers typically shared a “success” story, described new practices that they had tried in the classroom, or described an issue or dilemma that they were currently confronting. Problems of practice were discussed as a group and strategies from different classrooms, or different perspectives about how to address these issues were shared (Fieldnotes, Seminar transcripts). Despite the fact that two to six coteachers from each micro-community were present in each meeting, they each typically talked about different aspects of practice. Furthermore, this was one of the only formal times when all coteaching community
members gathered and to talk across disciplinary specialization about their experiences. This was one forum where curricular practices and pedagogical ideas were shared across disciplines, and where interns gained experience talking about their practice in a public forum with departmental colleagues who they did not coteach with.

**Wrapping up the day**

Period 7 ended at 2:17 PM. As the classrooms emptied out the coteachers began debriefing about the day and figuring out what needed to be done for the next day’s instruction. Grading needed to be picked up and divided, and coteachers needed to come to agreement about how points would be assigned. Students came by for tutoring or to take make-up tests. Coteachers gathered up copying and headed to the faculty lounge, or prepping materials for upcoming classes or labs. People also met afterschool for coplanning— on Mondays the Envi. Sci coteachers would meet for “Power Hour,” which often ran as long as two hours. Other coteaching groups generally would plan at the end of the week.

After school carpool members often felt pressured to wrap up quickly and go home. Carpool members would wait for each other while they talked to coteachers and finished up odds and ends, however they generally left the school around 3 pm. This resulted in people tending to bring work home, instead of staying at the school to finish it up. At some points in the semester this created issues with cooperating teachers who felt that the interns should be staying at school to do additional prep work for labs or activities (Fieldnotes).
Carpool rides back to campus

Typically by about 3 pm, the carpool groups had gathered in either the Environmental Science room or one the Chemistry classrooms, and were headed towards the faculty parking lot. Interns explained that the drive home provided times to “complain,” “vent” or decompress about the day. They “listen[ed] to the radio” or “chill[ed],” and frequently carpool members fell asleep (Intern Interviews, March and May 2005). Finally carpools served as important social spaces. As Amanda explained,

\[It \text{ just gives you a little more social time, because you're going to be social—it was just a matter of if it was in the car ride, or during lunch, or what have you. So it was nice to have that little bit of social time, just because you've lost all other aspects of your life. (Amanda, Interview, 5/25/05)}\]

According to intern reports, the carpools served as an important time to unwind and socialize. These rides provided a space for transitioning between Biden High and home. However, after a short break interns typically were back to work addressing student grading, course preparation and other professional duties. This is addressed in the section that follows.

Work, work, work: School comes home

One of the things that became clear as I listened to the interns talk across the semester was that their days were filled with a constant crush of schoolwork. During the day it seemed like they were always rushing to get something done before class or to grab a moment to confer with a coteacher. Once back in their apartments or dorm rooms it was not much different—it seemed that there were always lessons to be prepared (content to study up on and materials to prepare), papers to be graded, and things to be shared with
coteachers (Intern, Interviews, 5/05). At times, the amount of work seemed to be compounded by the fact that the interns were graduating in May. Around them their friends were enjoying the end of their senior year. In the previous section about carpools, there is a quote from Amanda about how carpools provided a “bit of social time, just because you’ve lost all other aspects of your life.” In regard to their semester experience, intern’s talked about the loss of their “social life,” “home life,” or “time to hang with friends” (Intern interviews). This clearly was a time of transition for the group as they took on professional duties and began to assume professional identities as high school science teachers. When the work of the classroom came home, professional duties extended into the interns’ private lives. A significant part of this was related to the demands of teaching. As they explained,

*I foresee the rest of my life, if I keep teaching, going and then coming home and then always thinking, I have something I need to have done. You know?* (Javier Interview, 5/26/06)

*There is a lot more after school that needs to be done… it all just keeps eating away at your 24 hours, every day.* (Amanda Interview, 5/25/05)

*I thought, "Oh my God it's going to be so easy. You wake up in the morning; you're done at 2." And it's not like that at all. You're tired, and the day doesn't stop. I think about what my expectation was—I thought I was only going to be working from like 7 to 2. And I took all of my work home. I always was trying to come up with new ideas, trying to understand things well because I am not that familiar with Anatomy. So I was always teaching myself and preparing my notes like a freaking nut. Always trying to be a chapter ahead. It just took up a lot of time.* (Samantha Interview, 5/20/05)

Most interns explained that after getting back to their apartments around 4 or 5 pm each day, they would relax for an hour or so with friends, eat dinner, and possibly go
to the gym before digging back into work. Then, each would work until about 11 or so each night.

*I would go home, and I would eat, and I would just start doing my notes again for the next day, and continue that until the night, until like 10:30 or 11:00 at night. That's like really late, but I was always so nervous I wouldn't know my material well enough. So I'd … not rehearse it, but read it over and over. Or try and look online to get more detail for fifth period [solo], or come up with activities, or a way to organize things differently…. So, I did all that.* (Samantha Interview, 5/20/05)

*Then I’d start grading and everything around like 7, 8. I'd grade, or do work if we had a Power Point to do, or something for the next day, we'd do that until 10, 11. Some nights I'd bring the papers home and say I'm not grading them. I'm too tired and I'd just go to bed early.* (Bernadette Interview, 5/20/05)

*I took a lot of time at home to prepare and to do lesson plans and stuff like that because it's a lot. Like, you need to be more explicit with your lesson plans [for coteaching]. I would try to make it almost like a script. Like make it very detailed, because, for instance, when we were co-teaching with Vincent [Environmental Science] there's six different people teaching in there. So, for them to know exactly how the lesson is supposed to go it needs to be almost like a script. So, in that sense, it takes a lot longer to plan. I mean, it's good because it gets everything in order in your mind, too, but it made it a lot longer to plan. So, I would go home and I would go work out usually, and then get something to eat. Then by then, it's like probably like 8, and then try to do all lesson plans-like, check my e-mail, get out all that kind-of stuff, and get all the lesson plans done.* (Luke Interview, 5/24/05)

As the semester progressed, some of the interns addressed the workload pressures by shifting more of their prep work towards the weekends and making the most out of their prep periods so that they could get as much grading out of the way as possible (Fieldnotes; Interviews). This strategy appeared to be most successful for Julie, who explained,

*JULIE: I learned, probably one of the most important things is try to keep school at school, because you'll have like no life at home.*

*JEN: How'd you learn that?*
JULIE: When I would be at home grading until like 10:30 and realized, Oh, I haven't eaten dinner yet. [Laughs] And then, Oh, I need to wake up at 5! In the beginning I was more worried about like relaxing while I was in school. Then I was like, “No, I don't need to relax while I'm in school. I'm here... I might as well be grading papers.” So, I pretty much I tried to get all my grading done during my two planning periods, and then I left. (Interview, 5/23/05)

Samantha also explained that she started relying on her coteachers more in order to help her feel less anxious in the classroom and also to help decrease some of her preparation.

Finally I was starting to get a little bit burnt out, and I said to Pasty, "I can't keep doing this to myself," because I was getting sick. And she was like, "You know, just let up off it a little bit. And you know, if you don't understand something, I'll be in there and I'll help you." And things like that. And then it got better. The semester got easier for me. (Interview, 5/20/05)

Luke explained that the pressure of the job hunt added another layer of tension to his evening work. Often he found himself dividing his evening hours between lesson plans, grading, and pursuing job leads.

You want to do the best that you can with your student teaching experience, but at the same time, you're like, "Well, can I, should I sacrifice all my time for that when the real ultimate goal of this whole experience is getting a job?" (Interview, 5/24/05)

Interns explained that after wrapping up their grading and prep work, they’d typically get to bed around 10 PM on an early night, 11 or 11:30 more typically. As Luke explained, “I'd shoot for six hours of sleep a night... I'd go to sleep around 11:30 on a good night” (Luke Interview, 5/24/05). Unfortunately, some—like Javier especially at the end of the semester—often found themselves working until the early hours of the morning trying to wrap up work needed for the next day. “You know. I would start working on something and not expect it to take that long. And then just keep working on it
until I was finished, which would end up being 3:00 in the morning sometimes” (Javier Interview, 5/26/07). Regardless of the time they went to sleep, the interns were up again between 5 and 6 AM and jumping into their cars, or waiting for their carpools by 6:30 the next morning. With their demanding workload most interns found themselves unable to participate in the University social life in the same way that they had before. They found themselves being pulled out of their former roles as students by their professional workload, and shifting toward new identities as high school science teachers (Fieldnotes, Intern Interviews, 5/05).

**Participating in the coteaching community of practice**

I began this chapter, asking the question what types of experiences do the teaching interns participate in as members of the coteaching community of practice and what are the implications of this involvement? As the data illustrate, within Biden High’s coteaching community there were a many different activities that the coteachers engaged in on a daily, or weekly basis. These experiences included formal instruction and formal interactions with colleagues in meetings, as well as informal work times and downtime with colleagues. Within these different spaces the coteachers participated differently in the community through their actions and interactions. For the interns becoming a recognized member of this professional community required that they learn these contextually appropriate Discourses and know how to participate in this setting accordingly.
Throughout this dissertation I identify the coteachers as a coteaching community of practice, drawing on the data presented in this chapter I would like to quickly clarify my use of this term and illustrate how this group is a coteaching community of practice. Wenger (1998) defines a community of practice as a group of people engaged in mutual practice, joint enterprise, and shared repertoires. In earlier work, Lave and Wenger (1991) argued that part of the experience of professional learning in community was linked to important issues of legitimacy of participation and access and transparency into the community’s culture of practice. Wenger describes joint enterprise as “defined by the participation in the very process of pursuing it [the community’s work]” (p 77). For the BHS community of coteachers, their joint enterprise can be interpreted on two levels. First of all, the community’s ongoing instructional practice was created and shaped by the coteachers’ ongoing interactions and discussions about practice. Second, the coteaching community of practice itself and what it meant to coteach evolved during the placement of the interns in this setting. Though a collaborative department, the cooperating teachers did not coteach as part of their regular practice, these collaborative teaching practices were particular to their work with the interns. Upon the interns’ arrival, the coteachers needed to construct mutual understandings and create a vision of what it meant to coteach in this setting. While some of the cooperating teachers had cotaught with interns during the previous year, the coteaching practices that evolved were in many ways unique and markedly different from the previous year (Cooperating teacher interviews, 2004, 2005: Fieldnotes, 2004, 2005). Additionally, as Wenger describes, part of the joint enterprise creates a sense of “mutual accountability” (p. 81) among community members for
addressing the work of the community. As part of their collective work coteachers shared the process of writing up formal lesson plans and gathering, or creating materials for instruction. Furthermore, grading was divided among coteachers who worked together (Fieldnotes; Interviews). When coteachers did not meet deadlines, or come to school prepared for class, these actions had serious ramifications for their coteachers and their shared classes. Failure to meet group expectations and needs created significant problems for coteacher relations at various points throughout the semester (Fieldnotes; Interviews). This notion of “co-responsibility” has been further developed as a central tenet of successful coteaching elsewhere (Scantlebury, Gallo-Fox, & Wassell, 2008). Finally, as discussed in the earlier section on coteaching and coplanning, community members developed shared language, practices, and mutual understandings unique to their experience. As illustrated in this chapter and further throughout this dissertation, this group of interns and cooperating teachers did indeed form a coteaching community of practice, which supported one another’s ongoing practices and development at Biden High School.

While each of the coteachers participated in the activities of practice described in this chapter, the ways that the coteachers participated in these structures and what they learned within these experiences were highly dependent upon the group of coteachers with whom they worked. The model of coteaching implemented at Biden High placed interns in multiple classrooms with differing combinations of cooperating teachers and interns throughout the day. Furthermore, they participated in a series of nested communities (Cazden & Mehan, 1989) that provided access to the larger professional
world of teaching and learning high school science. The chapter that follows presents an analysis of this experience and also describes the interconnected communities that the interns participated in during this semester. These varied experiences had implications for the interns’ participation within these settings and also their development as high school science teachers.
CHAPTER 5
THE COTEACHING COMMUNITY OF PRACTICE: A COMPOSITE OF MICRO-COMMUNITIES AND WHOLE COMMUNITY NETWORKS

In sociocultural theories of development, context is understood to be critical in shaping the learning and development of participants. Reciprocally, the participants also play a critical role in shaping the context. One of the critiques of traditional student teaching models is the idiosyncratic nature of the learning experience, which assigns a single preservice teacher to one cooperating teacher and that teacher’s courses. Such a model provides the preservice teacher predominantly with access to a single teacher’s teaching experience and the parameters of the practicum experience are framed by the one cooperating teacher’s practices, classroom structures, beliefs, and perspectives which play a strong role in shaping the preservice teacher’s experience. Furthermore, depending upon the classroom teacher’s status in the school, their background, and their perceived areas of expertise, the practicum science student teacher may only experience one type of course — (i.e. all upper level elective courses, Advance Placement Courses, or introductory level courses required for all students). In comparison, the design of State University’s coteaching model was markedly different. It placed a cohort of eight preservice science teaching interns within the science department at Biden High School, and due to scheduling arrangements each intern cotaught with multiple cooperating teachers on a daily basis. This aspect of teaching with multiple cooperating teachers and differing groups of coteachers is unique to this model of coteaching, and has not been reported elsewhere in the literature on coteaching. As is argued in this chapter, this design
created unique opportunities for interns to experience multiple different classroom experiences and approaches towards practice.

In this chapter, I develop the discussion around the multiple teaching micro-communities that emerged within the context of the model. I argue that each micro-community was distinct in the ways that participant roles were constructed and how they framed their coteaching practices. By working within multiple micro-communities, the interns engaged in very different frameworks for teaching. These varying experiences provided different insight and experiences to varying conceptions of what it means to teach and how one might frame his, or her, practice. Additionally, in this chapter I argue that in addition to gaining experience within multiple micro-communities, the interns participated in broader coteaching professional networks comprised of the composite of coteachers who worked at Biden High school, and also to larger professional circles that spread beyond the school setting. These networked professional experiences lead to the creation of a number of professional teacher networks of coteachers, and boundary-crossing experiences (Wenger, 1998) that supported the interns growing identities as secondary science teachers and professionals. The paragraph that follows briefly defines the terms micro-community and network as they are used in this study.

Coteachers spent most of the instructional day with other content specialists (i.e. Biology, Chemistry, Earth Science) with whom they taught. These content area sub-groups of coteachers taught the same courses and typically shared common science disciplinary knowledge grounded in university-based science majors. Each of these groups became what I call a micro-community nested within the larger coteaching
community of practice as they developed localized practices and common language and understandings specific to their practice. Some groups had their own identifiers by course or discipline (e.g. “Envi Sci,” “The Chemies”). As will be described later in the chapter, within each micro-community, group members’ roles and behaviors were differently constructed. Additionally, each micro-community had context specific practices.

Additionally, during time outside of instruction, the coteachers also interacted on a professional level with the larger group of coteachers at Biden High School. These interactions and the on-going professional exchanges that resulted are what I call the larger professional network of coteachers, or the entire coteaching community of practice, at Biden High.

The entire coteaching community of practice and the micro-communities are depicted in Figure 5.1. All of the cooperating teachers and interns who participated in the coteaching community of practice are placed within the large oval that bounds the coteaching community of practice. The circles formed by permeable dashed lines within the larger community of practice are the individual micro-communities and are identified by the names of the primary courses that each micro-community taught. In parentheses within each micro-community is the science disciplinary specialty of the interns who worked within that micro-community. Lines between the coteachers are used to show which coteachers cotaught classes together. These lines depict the formal everyday teaching interactions between participants that were created by the teaching schedule.
These different interactive groups are the units of analysis for this chapter, which seeks to illustrate the differing experiences provided through working in these varied communities. I begin this chapter by illustrating the widely different experiences situated within coteaching micro-communities, through a cross-case analysis (Miles & Huberman, 1994) of experience. After briefly describing three micro-communities that four of the interns participated in, I discuss the marked differences between the experiences and argue that through the experience of working within more than one micro-community the coteaching model provided preservice teachers with widely different opportunities to learn about practice even within one practicum school setting. Next, I briefly discuss the networked nature of the coteaching experience.
Working within and between micro-communities: A cross-case analysis of micro-community experiences

Interns spent the majority of each school day working with their micro-community members coteaching classes or working on courses during non-instructional time. As Lave and Wenger (1991) describe, access to cultural practices and transparency of the work of the community is an integral part of becoming a member of a community and the learning that results. For example, in their discussion of the learning experience of apprentice butchers, Lave and Wenger argue that structures in typical supermarket contexts often require that newer butchers work on specific lower level tasks in isolation from the more experienced butchers who are engaged in more technical skills (pp. 76-79). They argue that this limits the newcomer’s abilities to learn the wide range of practices that master butchers need to know as experienced members of the profession. In contrast, they explain how West African tailors learn their practice while working alongside others with a wide-range of experience and access to the ongoing conversations of the profession. Although participants learn the tailoring process by progressing through different tasks that become increasingly more complicated, everyone within the community of practice worked within the same space and was collectively exposed to community conversations and the full process of producing garments and interacting with customers. Lave and Wenger argue that this immersion in the full range of community practices supports the newcomers learning of the profession and their ability to become master tailors. As discussed in the previous chapter, the interns participated in all the activities that comprised the coteaching community of practice’s work throughout the entire day. However, within the different micro-communities the ways that practice was
constructed and that participants were able to engage in these activities varied greatly. Additionally, the interns gained different access into the thinking processes and varied perspectives of their more experienced colleagues.

As will be discussed in this chapter, due to different structural differences between the micro-communities (e.g. different bell schedules, courses taught, curriculum, and interpersonal relationships among group members) the work of teaching and also the ways that interns participated in practice varied. This section is intended to provide readers with insight into the experiences of three different micro-communities in which four of the coteaching interns participated. This cross-case analysis illustrates how the micro-communities differed in their construction of participant roles and how they framed their coteaching practices. For each micro-community examined, I synthesize the participation structures of the micro-community that impacted the ways that interns participated in the work of the micro-community. I also describe their access and transparency into the thought-processes of the more experienced cooperating teachers. Additionally, I present the key messages about curriculum and instruction that each of these micro-communities utilized in framing their practice.

The micro-communities discussed in this section are represented in Figure 5.2 and include: The 9th Grade Academy (Jeanine, cooperating teacher; Javier and Julie, interns); Environmental Science “Envi Sci” (Bernadette, Javier, Julie, and Luke, Interns; Vincent, cooperating teacher; Joan, special education cooperating teacher); and Biology/Forensics (Anne, cooperating teacher; Bernadette and Luke, Interns).
All four of the coteaching interns who participated in this intersecting group of micro-communities were members of the Envi. Sci. coteaching micro-community with Vincent and Joan. Vincent was a cooperating teacher with environmental science disciplinary degree; Joan was an alternative route certified special education teacher who majored in chemistry as an undergraduate.

Bernadette and Luke, science education biology majors, also cotaught Biology and Forensics with Anne who also had a biology background. Like Vincent, Anne had participated in a traditional university-based teacher education program.

Javier and Julie, science education earth science majors, also cotaught in the 9th Grade Academy with Jeanine, an alternative route certified science teacher with an undergraduate degree in biology. This interconnected group of three micro-communities is described in this chapter because of the marked contrast between the experiences of the participants in each micro-community.
The daily schedule for these three micro-communities is represented in Table 5.1 and discussed below. As the table shows, participants moved between the micro-communities throughout the day by class period.

Table 5.1. *Daily schedule for Environmental Science (Envi Sci), Biology/Forensics (Bio/For), and 9th Grade Academy*

<table>
<thead>
<tr>
<th>Before school</th>
<th>Period 1</th>
<th>Period 2</th>
<th>Period 3</th>
<th>Period 4 AB, C</th>
<th>Period 5</th>
<th>Period 6</th>
<th>Period 7</th>
<th>After School</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bernetta (Bern)</strong></td>
<td>Carpool to Biden High and Prep for period 1 before class</td>
<td>Bio/For: Coteach</td>
<td>Bio/For: – Coor II or Envi Sci prep</td>
<td>Coor II: Coteach with Anne</td>
<td>4A/B Bio/For: Solo 4C Lunch Envi Sci room</td>
<td>Envi Sci: coteach</td>
<td>Prep: Bio/For</td>
<td>Bio/For: Coteach</td>
</tr>
<tr>
<td><strong>Javier</strong></td>
<td>9th Grade Academy, Honors Coor I: Coteach</td>
<td></td>
<td></td>
<td></td>
<td>Prep: 9th Grade Academ y</td>
<td>9th Grade Academy, Honors Coor I: Solo</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Julie</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Period 3-4B = 9th Grade Academy, CP Coor I: Solo 4C Lunch Envi Sci room</td>
<td>Envi Sci Inclusion: Coteach</td>
<td>Prep time</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.1 represents the intern’s teaching schedules and shows how the interns moved back and forth between micro-communities across the course of the day. Each of the interns only taught Environmental Science once each day, however they also participated in this micro-community during carpools, lunch, preps and after-school.
The discussion that follows describes each of the individual micro-communities in order to present their unique differences. Key points that are addressed include the courses taught, coteacher interactions, power dynamics, nature of coplanning meetings, and typical curriculum and pedagogy of the micro-community. I present each of the individual case descriptions in order to help readers understand the nature of the experience provided within each context. The interns moved between these micro-communities throughout the day with each intern teaching in two of these groups. As will become visible, the experiences between these micro-communities were markedly different. A cross-case analysis of the three micro-communities follows the case study discussion in order to contrast the differences between participant experiences provided across these three groups.

**9th Grade Academy: Block scheduling, division of labor, teacher as individual**

Javier Rodriguez (intern), Jeanine Smith (cooperating teacher), and Julie Woldanski (intern) were collectively responsible for the 9th Grade Academy Coordinated I Science (Coor I) classes. This micro-community was jointly responsible for coteaching the 1st Block Coordinated Science class, then Julie and Javier each solo taught a block of Coordinated Science later in the day. The Coordinated Science classes were semester long block courses—double period classes that lasted 102 minutes. As part of the 9th Grade Academy, all 9th grade courses at Biden High were a semester long. The 9th grade was the only grade in the building to follow this schedule; grades 10 through 12 typically took year-long classes that lasted 50 minutes per class period. As both interns were earth science education majors and the Coordinated Science was an interdisciplinary science
course, most of their instruction for the semester was out of content area. The earth systems unit at the end of the semester was within their content area.

Julie and Javier struggled to work together throughout most of the semester (Fieldnotes; March and May Interviews, Julie and Javier; Program Documentation). In the beginning of the semester Julie wrote the following in her teaching journal,

> As far as my working relationships, I feel that all are going very well except with Javier.... He is really beginning to drive me insane and I think that my most difficult daily task is not lashing out at him. I find the way he asks me soooo many questions 2 minutes after we went over [something] extremely annoying.... I think it is just a clash of personalities that we will get over eventually.

Improve they did not; the interns’ interpersonal tensions continued throughout the semester. Javier was a strong student academically, and won a Geology award for academic achievement at graduation (Fieldnotes, May 18, 2005), yet he struggled with some of the demands the coteaching model. Javier explained that he did not feel “confident” or “comfortable” teaching in front of Julie, with whom he felt he was being “compared” (Fieldnotes; Javier Interviews, March 16 and May 26, 2005). Additionally, he often struggled to keep up with the workload of lesson planning, lesson prep and ongoing grading. Frequently, he missed the 5 pm Sunday deadline for submitting lesson plans (Fieldnotes; Documentation). Because he and Julie took turns writing lesson plans for Coordinated Science, she complained vocally to Claire Lyons and Robert O’Brien, their clinical supervisor, when Javier missed these deadlines. Additionally, Julie vented her frustration to Joan with whom she cotaught in the Environmental Science micro-

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10 Throughout the semester Javier struggled with issues of time management, despite this Vincent his other cooperating teacher commented that his lessons were always strong and often exceeded “expectations” (June Interview).
community. This appeared to impact Joan’s impressions of Javier as a professional (Fieldnotes, May 6, 2005; Joan Interview, June 6, 2005). These interpersonal tensions along with Jeanine’s approach towards coteaching tended to support an independent model of teacher as a self-reliant individual.

Jeanine (cooperating teacher) was new to the coteaching model. Her approach towards coteaching supported division of labor around teaching prep and practice and ultimately supported a much more individualistic notion of practice than intended by the coteaching model (Fieldnotes; Interview, Claire Lyons, Fall 2003). Javier and Julie were the first interns in the cohort to assume full responsibility for their solo classes during the first week of the semester when Jeanine was away for several professional development days (Fieldnote; Jeanine interview, June 7). Throughout the semester, Jeanine typically left the classroom during Javier and Julie’s solo classes and also during the 1st period cotaught class when Julie or Javier were leading instruction. She would, however, stay in the classroom when she was responsible for leading cotaught instruction, or if there was an activity that required additional support (Fieldnotes). Additionally, she was visible to students both before and after class, typically greeting them at the door with the interns. After class she checked in with the interns and was available to talk about their classroom experiences and received support from her via these conversations (Fieldnotes; Julie and Javier May Interviews). There was a sense that Jeanine was trying to provide the interns with space and independence in their practice (Javier and Julie Interviews). Both Javier and Julie appreciated the “freedom” that Jeanine gave them and the space to teach in the
classroom by themselves (Javier Interviews, March 16 and May 26; Julie Interview, March 12). As Julie explained,

> With my solo class at least, Jeanine has kind-of just thrown the class over to me. She is like, “They are yours. Take-em!” …. I think she has full trust in me, which really gives me a lot of confidence. So that works out really well.” (Julie Interview, March 12, 2005)

However, as the semester progressed and Julie began to feel abandoned by Jeanine as found she need to adjust the Block I Honors course to better fit the needs of her Block II College Prep solo class, and later during her (out of field) Chemistry unit which she planned and taught independently (Julie Interview, May 23, 2005). When she didn’t get the support that she believed that she needed to plan the chemistry unit from either Jeanine or Cheryl, the classroom teacher next door who also taught the unit, she turned to Amanda, Tim, and Pam, other chemistry teachers within the larger coteaching community of practice for suggestions and support (Fieldnotes; Julie Interview, May 23, 2005).

There was a very limited amount of coteaching that occurred within this micro-community. The coteaching that did occur primarily took place in the early weeks of the semester. After that point, the sharing of the classroom space mostly became a matter of division of labor and delegation of the various parts of instruction. As the Javier described it,

> The most it was ever co-teaching was in the beginning like in the first week or two. Jeanine would be like, “Okay, do you guys want to take care of this material?” And then your heart starts beating, you know. [Laughs] … But then at that point, the most it got towards co-teaching was, “All right, Julie, you go over this with them. I’ll go over this with them.” Or she would delegate, “Javier you do this. I’ll do this.”… I shouldn’t say that was the most co-teaching there was: When they would do a lot of lab activities, like with the cars going down
ramps [in the beginning of the semester], we would kind-of go back-and-forth saying things to the kids and stuff. And then we would both walk around and we would talk to the groups here and there. Um, so there were some decent co-teaching moments there. But then eventually it was just—like…“All right, you like this topic. And I’ll just do this topic.” …. “You come up with however you want to do it. I’ll do it the way I want to do it.” (Javier Interview, May 26, 2005)

As Julie remarked at the end of the semester, “With Jeanine, there was no co-teaching going on in there” (Julie Interview, May 23, 2005). The relationships, group dynamics and practice in this micro-community supported division of labor and swapping of lesson plans or materials when applicable. This was reflected in the coplanning process that the participants utilized. The curriculum for the first portion of the semester was the standards-based state-mandated curriculum on force and motion that emphasized state standards and teaching science through a standards driven, hands-on, inquiry-based approach. Jeanine had attended classes on how to teach the unit, and felt that one needed to adhere closely to the curriculum as it was designed. Students received worksheet packets comprised of the activities and readings and the teachers worked through them during the instructional time. As Julie explained, “Planning-wise in that class, it is pretty much—there’s no planning to be done. It’s given to you in these packets” (Interview, March 12, 2005). In describing this part of the semester in her interview at the end of the year Julie explained, “She [Jeanine] just said, ‘This is what we’re doing. This is how we’re doing it.’ And you said, ‘Okay’ ”(Julie Interview, May 23).

The curriculum shifted the second half of the semester and the coteachers had more control over instruction. During this part in the semester they planned for classes by predominantly drawing on the textbook and state standards as central guidelines while
drawing on additional teacher resources and audio-visual and electronic sources to support their practice. Throughout this part of the semester, they continued to utilize hands-on inquiry approaches and frequent pedagogical shifts in order to address the multiple learners in the classroom and to maintain student interest during the 102 minute course period (Interviews, Fieldnotes).

However, the teachers still didn’t work closely together to create the curriculum or instructional plans. Rather, coplanning meetings became focused around dividing up labor and assigning tasks. By the end of the semester, Julie and Javier were each delegated different lesson topics and instructional days (Fieldnotes, Coplanning meeting, May 13). They would plan for 1st Block instruction and bring in the materials that morning. Because of this division of labor, interns typically did not know the lesson plan and were then limited in how they could participate in instruction. Generally, the intern who had planned the lesson would teach while the other intern would observe the lesson, perhaps participating in the back of the classroom by providing managerial support. Then they would adapt the lesson plan in their solo course later that day (Fieldnotes, May 16 and 18, 2005). As Javier explained,

_We didn’t know what each other was doing. When you have no idea what the other person is doing, then you just back off. I mean, sometimes it was like, “Javier, can you help me pass these papers out?” Or whatever…. Sometimes… if the kids were in back and talking, you would just go and like, “Shhh, be quiet.” Or like one time, I was teaching—we were doing the seasons and the kids were being really loud. So Julie stepped in and said something to them. So, there was some of it._ (Javier Interview, May 26, 2005)

Because Coordinated Science I was a semester-long course, Javier and Julie were able to teach most of the 9th grade science curriculum. The state curriculum used in the
beginning of the semester emphasized hands-on inquiry science. The 9th grade students spent time each class involved in group inquiry activities, such as building roller coasters and crashing small wooden cars in their study of physics and laws of force and motion, particularly as applicable to Newton’s Law (Fieldnotes, February 22, 2005). Additionally, Jeanine emphasized the need for mixed methods and hands-on activities as important pedagogical approaches particularly in light of needing to sustain student interest across the long class periods. Julie and Javier quickly adapted these approaches (which had also been emphasized in their science methods and education courses) as a part of their regular practice.

For the most part the coteaching model adapted within the 9th Grade Academy micro-community supported a view of teachers as self-reliant individuals. Practice was supported by the sharing of resources, decreasing workload when applicable by dividing the tasks of planning for instruction, and through Jeanine’s availability for providing advice and talking about practice, which generally occurred outside of instruction. In light of the fact that Julie and Javier were having difficulty getting along, they appeared to welcome this approach, because it minimalized their need to interact and rely on one another. While these approaches fit within the norm of typical teaching practices, they do not align with the goals or assumptions of State University’s coteaching model, or the theoretical underpinnings of Roth and Tobin’s model of coteaching as an approach for learning to teach. With Jeanine out of the classroom during much of the instructional day, there were limited opportunities for Javier and Julie to observe Jeanine’s teaching practices, or to teach alongside her and talk about practice as lessons were occurring.
Additionally, due to Javier and Julie’s ongoing interpersonal difficulties and the tendency to divide up the tasks of coteaching and coplanning, opportunities for learning from one another were limited because they were less likely to think together about their practice during the planning process, or coteach and talk to one another while coteaching. Such an approach, while more aligned with traditional approaches, provides limited access and transparency into the practices of experienced practitioners and limits the newcomers’ opportunities to learn the cultural practices of the community. These experiences provided a marked contrast to the Environmental Science micro-community, which Javier and Julie also participated in. As will be described later in the chapter, the Environmental Science group was very collegial, and a context in which community members worked together to support each other’s practice. Additionally, the Environmental Science cooperating teacher remained in the classroom throughout cotaught classes and played an active role in coplanning meetings.

Javier and Julie’s experiences in the 9th Grade Academy with block scheduling also provided a marked difference from the 50 minute courses taught by the rest of the cohort. Teaching the extended block courses led Javier and Julie to reflect on issues of pedagogy, student learning, and student attention and motivation, and strongly reinforced the need for mixed methods practices and hands-on learning (Fieldnotes; Interviews). The Coordinated Science curriculum provided them with opportunities to experience a successful inquiry-oriented curriculum that actively engaged students in the process of thinking constructively about science. Additionally, the pedagogy of the micro-community provided the interns opportunity to see the effectiveness of mixed-method
pedagogy in maintaining student interest and motivation through the frequent shifting of activities and classroom pace during long class periods. These curricular opportunities provided the interns with successful teaching experiences that they could draw on in other contexts both during the semester and in their future practice.

Biology/Forensics: Traditional approaches and hierarchical power structures

The Biology/Forensics micro-community members included three coteachers with biology backgrounds: Anne Watson (cooperating teacher) and Bernadette McLean and Luke McGraw (interns). As a group this micro-community was responsible for an elective upper level combined Biology and Forensics (Biology/Forensics) course and one section of sophomore interdisciplinary Coordinated Science II. The Biology/Forensics course was designed by Anne who had developed it based on a professional development Forensics course that she had attended. This was the second year she had taught the course (Fieldnotes, April 14). Anne had a strong sense of the curriculum and clear ideas about how the course should be taught. Furthermore, her teaching philosophy was aligned with traditional views about practice and strong teacher control of the classroom. In working with the interns she adapted an approach similar to traditional student teaching hierarchies, and situated herself as the classroom expert and the experienced teacher who the interns were to learn from (Fieldnotes, Interviews). As will be discussed in the section that follows, Anne’s approaches to collective practice strongly shaped the ways that Bernadette and Luke could participate within this micro-community and the degree to which they could shape classroom instruction.
During solo classes, Anne frequently left the room. Early in the semester she explained to me that she needed to do this as “the authority figure” in the classroom in order to help open up space for students to view the interns as “the teacher” (Fieldnotes, 2/22/05; Interview, March 15, 2005). While she believed that this helped the interns become recognized by students as a classroom authority figure, she did not appear to realize that other ways that she interacted with both the students and interns maintained her centrality of control in the classroom setting. Some of this was present in the ways that she spoke to their students about the classroom referring to things and people as, “my classroom”; “my inbox”; “my students” (Fieldnotes, March 8). Other instances, such as when she reprimanded the students in a class for poor behavior on a day when she had been absent and Bernadette had taught the class on her own, also served to undermine the interns as classroom teachers. On this particular day, while harshly reprimanding the class she referred to Bernadette as a “Little Birdie” while she was in the classroom,

As Anne finished handing out the numbers, she raised her voice. It got very loud and high, kind-of squeaky, She said, “NOW, when have I ever given you a free day? I understand—a little birdie told me that you all were trying to take a free day yesterday.” She never said it was Bernadette, but there was clearly a sense [that Bernadette and Anne had talked about the class]. Anne was getting across the idea that, I know what you are up to and you cannot pull anything over on ME during MY class. She said, “During MY class you need to be working. I do not give you free time. I do not expect you to be fooling around when I am not here.” My jaw dropped. She was really reading them the riot act. Bernadette continued quietly just facing the board sort-of as if she was pretending she was not there…. “When have I ever given you a free day?” “I can’t believe this could happen in my room.” “My students feel like they are able to do whatever they want.” I was just kind-of shocked.

During this, Bernadette quietly snuck and sat down in a seat in the middle of the front center table. When Anne finished with her rant, Bernadette just stood up and picked up as if nothing had happened. (Fieldnotes, Biology/Forensics Period 7, Anne and Bernadette coteach)
In addition to asserting herself as the central authority figure in the classrooms, in front of students, Anne also maintained control of the course curriculum and tended to direct instructional practices. Biology/Forensics coplanning meetings were quick and very pragmatic. Anne typically directed discussion by outlining upcoming lessons, identifying which topics were to be covered each day, and presenting interns with worksheets to be used. Interns typically noted up-coming events and assignments in their plan books. I wrote the following annotated memo about a Coordinated Science coplanning meeting between Bernadette and Anne,

If I were to characterize things, I would think that Anne came to this co-planning session with a strong idea of what was going to occur, and with her resources and materials, she made a comment like, “Well, since the warm-up is already written, it seems silly not to use it.” “I already have an activity for that.” “I was looking through my files and I found this” and she pulled things out. It was as if she figured, “I’ve got that covered.” Again, another time she said, “I figured they should be able to get this done by Friday.” She absolutely was in control, and to me there did not seem that there was as much room for Bernadette to make choices and decisions (Fieldnotes Annotated Memo, Anne & Bernadette, Coor I Coplanning meeting, Feb 17, 2005).

Bernadette in particular was very quiet during coplanning meetings quietly taking notes often seeming disconnected from the group (Fieldnotes, February 17, April 14 and 28, May 9). I asked her about this later in the semester.

JEN: Lately, in the planning meetings I’ve gone to, you’ve just shut down in them. I mean, I watch you and it’s just like—
BERNADETTE: Oh, I’m in my own world.
LUKE: Yeah, you are.
BERNADETTE: Because every time I speak, she just tells me I’m wrong and lectures me like I’m wrong—but like I tried to put input in, like I think the first two or three planning sessions but after that I just gave up because I’m not going to sit in front of her and—I don’t want to make the whole experience hell.
LUKE: Exactly. Like, you’re not going to—it’s not worth it to stand up for yourself. I mean, then you have to deal with this person for the next 10 weeks....
BERNADETTE: …. I wouldn’t be afraid to stand up [if she was a regular teaching colleague], but the fact is that she’s the cooperating teacher and part of my passing. (May 9, 2005)

Anne’s planning style became even more directive during the forensics part of the curriculum. For example, she arrived at the April 14th and 28th coplanning meetings with the upcoming weeks plotted out on a calendar and the curriculum delineated. For example, as the meeting began, “Anne said, ‘The good thing about next week is that it’s already planned.’ ” (Fieldnotes, Coplanning meeting April 28). During the meeting she acknowledged that she was directing the coplanning session stating, “I realize that I’m still kind of driving this plan, but I don’t know how to get around it.” As I noted in my fieldnotes,

The forensics unit is Anne’s pet. This is the second year she’s done it, and it seems like she’s still not relinquishing control. She said at one point, “Well, I’ve gone and I’m pulling rank. I’ve gone ahead and laid things out on how they’re going to be done and what we need to do. She handed each Bernadette and Luke big stacks of the curriculum that were all organized in order and had the lesson plans and everything in them. Luke and Bernadette had their plan books out, Anne had out a notebook. The meeting started by Anne giving them the stack of papers….. [Throughout the meeting] Anne kept saying to me that this lesson was more directed that usual and that it was less of a “co”planning session than usual, and being very apologetic. (Fieldnotes, April 14)

This "coplanning" session is predominately an informational session for Luke and Bernadette. They are getting told what will happen when, how things will be set up, when they need to stay late and how everything will run for the rest of the year. That tends to be a visible pattern here. Does Anne just know how to talk the talk, or is this unusual? My feeling is that she knows what things are supposed to look like and thinks that statements such as these will make me believe that this is not business as usual, while in actuality it is. (Fieldnotes, April 28)

I asked Bernadette in the hall about the co-planning I’d seen. I asked, “Is it typical? Anne implied that she was pulling rank and that it wasn’t [typical].” Bernadette felt it was totally typical. She was surprised by the comments that it was not typical. (Fieldnotes, April 14)
Despite the intern’s perceptions that they had little voice in the planning process, in her March interview, Anne commented on how much the interns pushed her thinking pedagogically and helped her to expand upon her practice. She found that Bernadette and Luke frequently brought new ideas to planning sessions and helped her to think about her existing practice in new ways. As Anne explained, “They make me think outside the box more…. The activity that [we’ve revised] is more student-directed. To me that’s the neatest thing—that I am thinking a lot more outside the box. (Anne Interview, March 15, 2005). Furthermore, although the coplanning meetings that I observed appeared to be fairly directed and influenced by Anne’s ideas with little input by either Bernadette or Luke, Anne remarked that the interns frequently asked questions about her instructional choices. These types of questions helped provide interns with access into Anne’s decision making processes and reasoning about her curriculum, thus providing them with insight into this experienced teacher’s thought process. As Anne commented,

*I think it is a much more of a co-planning effort...this year...They are also much more ready to question and say, “Why are we doing that? Why don’t we do this?” .... I think that every now and then I bite my tongue—just because you want to do it how you know how to do it. But at the same time, when I decide that this is important, it is interesting, because you get a, “Why are we doing it that way?” Which if I don’t have an answer for the question, I have to stop and think about it. And out of the two of them, I have one [intern] who questions more than the other. Not necessarily, “Why don’t we do something else? Just more, “Why have we chosen to do this instead of this? (Anne Interview, March 15, 2005)*

These types of questions, while providing the Bernadette and Luke with access to Anne’s decision-making processes, unfortunately did not provide opportunities for the regular co-construction of curriculum and lesson plans, or as legitimate coteachers in the micro-community setting. In general, Anne maintained tight control on the curriculum and
lesson planning process as well as the actual implementation of instruction in the classroom. One way that she maintained control in the classroom, even when she was not present, resulted from her tendency to abruptly correct the interns in front of the class. As Bernadette explained, “When she’s in moods like that I just don’t even like teaching in front of her, because if I say anything wrong she jumps in and says stuff to me right in front of everyone” (Fieldnotes, May 9). As a result, both Bernadette and Luke were often hesitant about how to proceed during cotaught classes when Anne left the classroom even if they had previously cotaught the lesson earlier in the day (e.g. Fieldnotes, Bio/Forensics, Period 6, Cotaught class Anne and Luke, May 9). In general Anne’s strong control over the micro-community’s practices impacted the ways that Bernadette and Luke participated in this context. Anne’s approach towards maintaining control over classroom practice and limiting the interns’ voices in the teaching process limited their ability to work within this micro-community as full coteaching members. While they were able to participate in instruction, they played a limited role in the on-going development of practice and had a limited voice in shaping practice. While they gained opportunities to teach in ways aligned with traditional practice, opportunities to: develop their professional voice, be recognized as legitimate teachers, or experiment with other pedagogical practices were limited. As Lave and Wenger (1991) write, “Gaining legitimacy is… a problem when masters prevent learning by acting in effect as pedagogical authoritarians, viewing apprentices as novices who ‘should be instructed’ rather than as peripheral participants in a community engaged in its own reproduction” (p. 76). Fortunately, Bernadette and Luke also participated in the Environmental Science
micro-community, which provided a marked contrast to this one. Additionally, they found that their solo teaching class period provided some space for developing their voice and practices as teachers (Bernadette and Luke, Interviews, March and May). One way Bernadette circumvented the issue of limited voice in the coteaching and coplanning process was by altering lesson plans in her solo class and adapting her instructional approaches in ways that she believed better fit her student’s needs (Fieldnotes, Interviews, March and May). However, she still felt constrained by Anne’s teaching practices; finding that the “inherited” structures (Britzman, 1991, p. 20) of Anne’s classroom which had been in place since the Fall made it difficult for students to adjust to her different approaches (Interview, Fieldnotes).

Bernadette and Luke were initially enthused about what they viewed as the potential of the Biology/Forensics course. They saw this class as an excellent opportunity to integrate biological concepts into forensics and the understanding of crime situations using the hands-on inquiry approaches that they had learned in their science methods courses. Prior to the beginning of the forensics unit Bernadette told me,

Now that we’re finishing up and getting into forensics, like forensics will be totally fun because people will have hands-on things, and I know the students will be into it… It’s really cool—we just need to brush up on our forensics to make sure that we can do everything…. I watch CSI and all those shows—like Confidential and stuff. [I’ve learned about] incorporating the bugs and the entomology in the forensics. Like, they go through and if they find a body, they can assess how long it’s been there and how long it’s been dead by the bugs that are on it, like beetles and stuff. I think that’s really cool. That’s why I asked Anne if I could do it…Like, she does hair analysis and everything, but I’m more into that aspect of it. Like, I approach the lab work more like the actual crime scene kind-of thing, so that will be different. I’m looking forward to forensics because I know everyone will get into it. (Bernadette, April 18, 2005)
However, as the semester developed they found that pedagogy, laboratory approaches, and assessments supported by Anne to be much more traditional and lock-step than they had anticipated. Additionally, labs were prescribed and not inquiry-oriented. After having looked forward to the forensics unit for many months, when it began and Bernadette and Luke still found that they had little, or no, voice in the planning process and that instruction did not reflect inquiry-oriented pedagogy and investigatory lab practices they became extremely frustrated. They did not express their frustration to Anne, but their disagreement was visible below the surface as I observed in a coplanning meeting on April 14th.

Both Luke and Bernadette were very quiet throughout this meeting. Luke made a face—when Anne told him that, there’ll be a crime scene, but the students won’t actually collect any evidence, because there’s over 100 of them, and it’s not possible for them to collect evidence. She said, “It’s just going to magically appear in the room for them to work with.” He really made a face at that point. I think that the interns have ideas about how things could be done, but this is definitely a place where their voices aren’t welcome and control is not shared.

Things became increasingly tense on May 9th, when the interns were told about how the final exam practicum would work. Because there were not enough materials in the purchased packaged crime scene, students would not be able to complete all of the tests—despite the fact that they would be responsible for classmates’ findings as part of their final grade. When the interns were informed how this would occur during their 6th period prep they became angry. However, they didn’t comment on this until the end of the day when they were alone in the Environmental Science classroom; then their anger boiled over (Fieldnotes, May 9).

BERNADETTE: What do you mean they all have to do one lab [for the final]? Ridiculous!
LUKE: Yeah!
BERNADETTE: Ridiculous.
LUKE: What’s that all about?
BERNADETTE: I think I’m seriously going to go in and ask, “Is there any way that we can get more materials for the lab?”
LUKE: Every group should be able to do every task.
BERNADETTE: That’s the whole point.
LUKE: Yeah, that is the whole point…. And they’re going to be like, wait, my grade depends on if they screw up or not?
BERNADETTE: Exactly….. We have blood typing stuff from the other lab she has. Why can’t we—
JEN: Do you have extras?
BERNADETTE: Yeah. We have extra blood. Why can’t we do that stuff—
JEN: To substitute it?
BERNADETTE: Yeah—
JEN: Maybe you need to go talk to Anne. Not to cause problems, but—
BERNADETTE: I mean, I don’t know. I’m afraid to talk to her, like she just—she has no respect for me personally whatsoever and I just—therefore I don’t even feel comfortable talking to her. (Conversation transcript)

Both Bernadette and Luke occasionally exhibited what Anne viewed as subversive behavior in this Biology/Forensics context (Fieldnotes; Anne Interview, May). For example, on the day before spring break without checking with Anne first, Bernadette asked students to collect water samples over vacation and bring them to school for a water-testing lab (Anne Interview). Additionally, on a couple occasions both Luke and Bernadette invited me to observe classes without informing Anne that I would be arriving. On at least one occasion, Anne stated, “Not that it matters, but did I know you were coming today?” (Fieldnote, May 9, 2005). Many of the days I observed were difficult ones marked with disagreements or underlying confrontations. At these times I wondered if I was invited to attend for alternative reasons. Was I there to witness a particular situation, or in the hopes that my presence might help temper behaviors? (Fieldnote, Personal Memo, May 9, 2005). However, both Luke and Bernadette
consistently commented that the day’s events and interactions represented typical experiences and it appeared that the patterns I was observing were normal to the group.

By the end of the semester, Bernadette and Luke both expressed that they felt that they had little control over pedagogical practices used in instruction and were frustrated with the directed nature of instruction and lack of hands-on inquiry science labs. Furthermore they felt taken advantage of when Anne assigned them what they viewed as disproportionate amounts of grading. In sum, they felt that they had little voice or agency in directing the curriculum or in practicing in ways that they valued.

LUKE: I don’t feel like I’m treated as an equal [by Anne]. I feel like with Vincent I’m treated like an equal…. I mean, how many of our ideas did we use in biology, like one?
BERNADETTE: Maybe one, yeah.
LUKE: The only idea that we used was the project—creative writing project …. Oh, and the viruses debate. That was ours. (May 9, Conversation transcript)

Despite the many frustrations and disappointments Bernadette and Luke experienced during their work in this micro-community, they were able to gain experience teaching with and learning from a strong traditional science classroom teacher who willingly shared her classroom resources and teaching materials (Fieldnotes). Working within this setting, Bernadette and Luke were able to experience and try out traditional lecture and laboratory teaching approaches which contrasted with the pedagogy that they had learned in their science methods course at State University. Furthermore, they were able to experience one way of framing a Biology/Forensics course, despite the fact that they did not agree with the approaches used. Participating in this traditional science classroom reinforced their commitment to inquiry-based science approaches (Fieldnotes, Interviews). Additionally, this experience provided a marked
contrast to their work in the Environmental Science micro-community. Those teaching experiences are discussed in the section that follows.

*Environmental Science: A strong sense of mutuality and cohesiveness, “We’ve got each other’s back”*

The Environmental Science (“Envi. Sci.”)11 micro-community was comprised of the four teaching interns who have already been discussed in this chapter (Bernadette McLean, Javier Rivera, Julie Waldanski, and Luke McGraw), Vincent the cooperating teacher, and Joan Harris a cooperating teacher/special educator. This was an interdisciplinary group of science coteachers. Bernadette and Luke were both biology specialists; Javier and Julie earth science content majors; Vincent an environmental science specialist; and Joan an alternate route certified special educator had a B.S. and prior work experience in the field of chemistry. This mix of interdisciplinary backgrounds provided opportunities for coteachers to talk about different ways of teaching and interpreting content material during coplanning meetings (Fieldnotes, February 17, 2005). Also, Julie remarked that she enjoyed the different interdisciplinary perspectives that people were able to contribute during instruction (Fieldnotes).

Vincent’s room was a social one. Coteachers took their work seriously, yet during informal time such as lunch or after school one could escape from the pressures of ongoing work, blow off some steam, or turn to a colleague for support, a pat on the back and encouragement. Group interactions often took a playful turn, for example when working after school on an answer key for a multi-station lab, a water fight broke out
amongst the interns who grabbed the squirt bottles sitting on the lab benches (Fieldnote and Meeting Transcript, April 20, 2005). Within this classroom there was a cultural understanding regarding the importance and need to enjoy and support colleagues and also get a break from the on-going pressures of teaching (Fieldnotes, Participant interviews).

After Javier and Julie stopped carpooling as a pair early in the semester due to interpersonal tensions, the Envi. Sci. interns merged to form a larger carpool. Though often tired at the end of the day when they gathered for the carpool ride home, they were a jovial group who as a collective joked around and appeared to enjoy one another’s company (Fieldnotes). Luke called the group “the posse” (Fieldnotes, May 9, 2005) and near the end of the semester as I arrived as State University for a program-wide Seminar meeting, the Environmental Science carpool also arrived in the parking lot cheering and waving out of the windows (Fieldnotes, May 17, 2005).

“Power Hour,” this micro-community’s weekly coplanning session, was characterized by a collaborative, collegial environment in which all voices were respected and participants worked together to develop their plans for practice. This fit in with Vincent’s views about coplanning and the value of learning to develop curriculum as part of a practicum experience. As he explained,

They do bring stuff to the table. And I challenge them to do that, because I don’t necessarily want to be the cooperating teacher who’s the dictator and says, “You’re going to do this, this, and this in this order, and here’s the activity. You go learn it. You’re going to present it tomorrow. You’re going to do this part.”

11 As the semester progressed all the interns began referring to the course as “Envi. Sci.” This is the term that I use throughout the dissertation to identify both the course and the micro-community
don’t think that’s a fair thing to do. And that’s not the point of co-planning and this co-teaching model. (Vincent interview, 5/2/05).

It’s not a worthwhile experience if you are handing [the curriculum/lesson plans] to them either. — So they get good at doing something that was handed to them, which isn’t necessarily all that teaching is, you know. How many people get their whole curriculum handed to them and are told, “You’re going to do it this way and it’s the only way you’re going to do it?” (Vincent interview, May 2, 2005).

I don’t like to hand them a map and say, “Here, this is what you’re going to do.”…. You know, if I gave them everything, what would they really learn? — How to teach the kids curriculum? (Vincent interview, June 7, 2005)

Using the textbook as a curriculum guide, group members brainstormed and shared ideas about how to teach the concepts to their students. They utilized a wide range of resources to inform their practice such as internet resources, classroom resources, teacher materials, and their collective knowledge to develop common understandings of what the lessons and activities would look like for the upcoming week. This micro-community worked to integrate a hands-on approach in their practice and regularly experimented with new pedagogical approaches. Typically, multiple activities or demonstrations were incorporated into each week’s instruction. This presented a real challenge for the coteachers in light of the large amount of prep work that was necessary. Additionally, the interns experimented with different pedagogical approaches for presenting information, such as the incorporation of different note-taking approaches in their instruction (Fieldnotes). As Vincent explained,

VINCENT: I think they’re very conscientious about mixing it up. If we’re doing too much of this and too much of that making sure we don’t fall into a rut…. So we’re trying to think about ways that are going to stimulate and motivate…. kind-of mixing up the instructional activities. They do that. They do that well.

JEN: So they are also trying out different types of pedagogical approaches?

VINCENT: Yeah. And I try to also make sure that happens as well. I’m like, “Okay, here’s the CRIS book, you know, student strategies. Pick something out of
there that you don’t know.” And we did picture notes the other day, which was another thing, which was kind-of interesting. We gave them a reading, and then from the reading they had to represent what happened in that section just using pictures and then explain to the class the different aspects. Something I had done a couple of times earlier, so the kids were familiar with it. It was new to them [the interns], you know. It was my challenge to kind-of like, “Okay, let’s do something new. Let’s do it differently.” So they get that experience. (Vincent interview, May 2, 2005).

Once plans for the week were sketched out, work was divided up and each intern assumed responsibility for preparing different materials and activities. Often, several interns collected materials for a single lesson, or created various parts of the lesson (Fieldnotes). Lesson plans were shared via email and materials were prepared throughout the week—often at the last minute and rushed into the classroom prior to the 3rd period class (Fieldnotes).

While all Environmental Science micro-community members coplanned together during Monday “Power Hours,” these teachers did not all coteach together. The interns and Joan each taught only one period of Environmental Science. As a result, their lessons required high levels of coordination across the teachers who all utilized the same lesson plans and materials for each lesson (Fieldnotes). Vincent cotaught with interns during each of the three daily Envi. Sci. lessons, and also with Joan and Julie during the period 7 Inclusion Envi. Sci. class. Because the large group of interns divided up the responsibility of preparing lesson materials, when plans were adjusted after coplanning meetings it was a challenge to share the new details about the lesson with everyone. As the only participant who taught the course more than once a day, Vincent served as a common link across the classes who relayed the pragmatic details about the lesson or changes to the
initial lesson plan (Fieldnotes, Vincent Interview, May 20 and June 2). Interns also communicated this information to each other throughout the day. I frequently observed them filling each other in on how things were going and what to expect during snatches of free time in between classes and during preps and lunch. On numerous occasions, Julie also attended Bernadette and Vincent’s period 5 class to see how things were going before she cotaught the class period 7 (Fieldnotes).

There was a clear sense of mutuality and cohesiveness between the interns with a strong sense that “we are in this together.” This was evident in the way the group pulled together to support Javier for the group’s May 6th lesson on water filtration. This day was uncharacteristic for the group as the lesson materials were assembled at the very last minute leaving the group was less organized than usual. Javier had had a difficult time gathering all the materials that he needed for the water purification demonstration and stayed up late the night before preparing a fairly complex lesson that incorporated a demonstration, a student handout, and a Power point presentation that supported the class lecture and contained an video clip with supporting information.

Several of the interns and Joe, who was not a part of the micro-community, coordinated efforts and gathered materials for the activity. All the materials were gathered in the Environmental Science classroom before period 1 on the morning of the lesson. However, Bernadette, a student classroom aide, and Vincent assembled the water purification system and photocopied the handouts for class during their morning prep periods. As Vincent said to me before the lesson started, “Let’s just say he’s lucky that he has a supportive team” (Fieldnotes, May 6th). The demonstration was first run during the
cotaught period 3 class when Javier, Luke, and Vincent worked on issues of timing and the flow of the lessons. Throughout the day both Vincent and Joan clearly pointed out that last minute efforts to pull a complicated lesson together were a less than ideal way to approach a instruction, and not possible when one taught alone (Fieldnotes; Transcript). However, the interns improvised and pulled together to make sure that the lesson occurred and students were supported in their learning about water filtration. In fact, Bernadette and Luke both cotaught the period 6 class with Joan (with whom they did not regularly teach), because she was teaching alone that day\(^{12}\) and had not had the opportunity to review the materials. Joan was very appreciative of their help, as she was extremely frustrated about not having had the lesson materials ahead of time for review (Fieldnotes, period 6, May 6\(^{th}\)). Luke and Bernadette were happy to help out during period 6. As Luke explained to me, helping out was not a big deal and he “had it covered” (Fieldnotes, period 6, May 6\(^{th}\)). At the end of the day Luke told me,

> The lesson actually went a lot smoother during sixth period than it went during third period when we first originally did it, because we knew how to like time things better and everything, and we kind-of just had each other’s back on a lot of things…. I knew she was concerned at the beginning of the class about like, knowing how to do the demo and stuff. So it was cool, because I felt like—I don’t know. I was just helping her out, and the kids in that class were very respectful. (Transcript, Luke follow-up on day, May 6)

As I noted in a memo at the end of the day:

> When I was in talking to Bernadette or Luke. They said something about the fact that there was a group of them made it a successful lesson—that they do have each other for support. I agree that group leans on each other; they use each other to support each other’s work—to support what they do and to help each other out. I don’t think that Bernadette, Luke, or Javier was overly upset about how things got pulled together today. I mean, they realized that there was last

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\(^{12}\) Julie was off campus for an interview, and Vincent had to leave early that day.
minute running around and hassles, but it was the notion that they have each other to help each other was clear and that they can do these things together. I think this is a strength that some will also see as a weakness of this model. The question is: When does the support become a crutch, and when does the support make it possible to be better? (Personal Memo, Fieldnotes, May 6).

The interns’ experiences within the Environmental Science micro-community were noticeably different from their experiences in either Biology/Forensics or 9th Grade Academy. The Envi. Sci. micro-community was a group of interdisciplinary coteachers who supported each other and collectively brought a wide range resources and experiences into their teaching practice. As a collective the interns felt that they had a strong voice in the on-going development of lesson plans. Coplanning was a mutual process of brainstorming and sharing ideas. This contrasted with planning experiences in the other micro-communities described where they either received lesson plans and then implementing the prescribed lesson, or divided up the lessons and planned the entire lesson independently. Furthermore, throughout the semester, Vincent guided the interns through the coplanning process — openly shared insights from his classroom experience, and challenged them to ask questions about the effectiveness of the pedagogical approaches they used in instruction (Coplanning meetings, February 17 and April 20). Within this setting interns experienced a collective co-construction of lesson plans, and Vincent felt that it was important that the interns gained experience engaging in the process of instructional development.

Furthermore, within this micro-community, the interns were part of a collective of supportive colleagues who worked together to develop and support practice. For the most part the significant interpersonal tensions that existed in the other contexts were less
visible. Despite Javier and Julie’s less collegial experiences within the 9th Grade Academy, these same interns experienced a strong sense of community in the Environmental Science micro-community. The sense of mutuality and support experienced within this micro-community and in the broader coteaching community of practice network, led the interns to value the role of colleagues in supporting one another’s practice. Like the interns within the larger cohort at Biden High, these interns commented in their May interviews that they valued being a part of a professional group of practitioners and remarked that and were looking forward to working with colleagues in their future schools. At the end of the semester, both Julie and Javier (who had both secured employment for the following year) spoke specifically about ways that they anticipated working with specific colleagues in their new schools to plan for and support ongoing instruction (Javier and Julie interviews, May 2005).

Comparing the micro-communities: A cross-case analysis

Each of the micro-communities described in this chapter afforded participating interns with different insights into ways that they could shape their practice as high school science teachers. By participating in more than one micro-community, the interns were able to participate in and learn about alternative constructions of practice and compare and contrast these experiences. As Javier explained to me early in the semester, “I compare, Vincent’s class to Jeanine’s class a lot, because they are so different” (Javier Interview, March 16, 2005). The interns drew on different aspects of their experiences in each of the micro-communities carrying practices across contexts throughout the
semester and as they talked about their future practice (Fieldnotes; Interviews). Within different micro-communities the ways that practice was constructed and how participants engaged in their work varied greatly. Interns gained different access into the thinking processes and varied perspectives of their more experienced colleagues. The work of teaching and the ways that interns participated in practice varied partially due to structural differences between micro-communities (e.g. bell schedules, courses taught, curriculum, and interpersonal relationships). As described in this chapter some of the factors that impacted the ways interns participated and learned within each context included: group dynamics, access and transparency to cultures of practice and coteachers’ thinking processes, conceptions of practice and the roles of teachers/coteachers, views of curriculum and pedagogy, and the planning process.

Lave and Wenger write about the issues of access and transparency into the cultural practices and working lives of the professionals as an important part of learning. The micro-communities discussed in this chapter afforded different levels of accessibility to the process of planning and teaching, into the cooperating teachers’ thought processes. Additionally, different images of teacher practice and the process of teaching were constructed within each of these micro-communities. Within the 9th Grade Academy Javier and Julie were able to teach a required interdisciplinary course for freshman. Here they participated in practice that framed the teacher as a self-reliant individual who grounded practice in mixed pedagogical approaches and hands-on inquiry science. Within the Biology/Forensics micro-community, Bernadette and Luke were able to teach an elective course for students in the upper grades. Within this context, practice was
framed through a traditional lens of teaching with a perspective of the teacher as the classroom expert and holder of knowledge. Although the interns did not agree with this approach, instruction in this classroom was teacher-centered with a strong emphasis on classroom management and control. Within the Environmental Science micro-community, the role of teacher was constructed as a collaborator and part of a mutually supportive professional community where one’s voice and perspectives were valued. Instructionally, the interns participated as curriculum developers who utilized a wide range of resources to support their practice and address the course curriculum through the implementation of many different pedagogical approaches in the classroom.

Many of the issues experienced within the micro-communities reflected dilemmas found in traditional models of student teaching, yet despite this, the contrasting teaching contexts provided very different opportunities for learning and practice. Furthermore, each experience provided both positive and less opportune learning experiences. In the 9th Grade Academy micro-community, a limited amount of coteaching, or coplanning occurred. Opportunities for Javier and Julie to observe Jeanine teaching, or to teach alongside her and discuss practice in-situ were restricted. Additionally, Javier and Julie rarely conversed during planning or instruction. While such approaches fit within norms of typical teaching experiences, they do not align with theoretical underpinnings of coteaching as an approach for learning to teach and limited opportunities for learning. Teaching block courses, however, provided rich opportunities to reflect on issues of pedagogy, student learning, and student attention and motivation. Mixed method approaches and hands-on learning, which had been taught at the University, were strongly reinforced. In the Anatomy and Physiology micro-community, Bernadette and
Luke were able to ask Anne about her decision-making processes. Though able to learn about her thinking and planning, Anne’s tight control over practice limited the interns’ ability to co-construct curriculum and instruction, develop their professional voice, be recognized as legitimate teachers, experiment with other pedagogical practices, and work within this micro-community as full coteaching members. Despite this Bernadette and Luke gained experience teaching and learning with a traditional science classroom teacher who willingly shared her classroom resources, thought processes, and teaching materials. Additionally, their experience and with the traditional lecture and laboratory teaching approaches reinforced their commitment to inquiry-based science approaches, and they had the space to experiment and develop their own voice within solo taught classes. The Environmental Science micro-community provided a marked contrast to both of these experiences. Weekly coplanning sessions were collaborative and collegial and all voices were generally respected as participants worked together to develop plans for practice. Throughout the semester, Vincent guided the interns through the coplanning process — sharing insights from his experience, and challenging them to examine the effectiveness of their pedagogy. Using the textbook as a curriculum guide, coteachers brainstormed and shared ideas about how to teach their students. They utilized a wide range of resources, including their collective interdisciplinary knowledge, to develop instruction. They integrated hands-on approaches in their practice, regularly experimented with pedagogical approaches, and incorporated multiple activities or demonstrations into weekly instruction. However, this process was not always smooth as the large size of the group created communication difficulties, particularly when lesson plans changed within a day or so of implementation. Finally, a strong positive part of this
experience was that within Vincent’s classroom there was a sense that it was important to enjoy and support colleagues while getting a break from the on-going pressures of teaching. Here the interns were part of a community of supportive colleagues.

The multiple teaching contexts provided interns with opportunities to develop multiple frames of reference for their work. Interns were able to experience different approaches to practice in and access coteachers’ varying perspectives about teaching. These experiences reinforced a viewpoint that there is no single “correct” way to practice, but that multiple approaches can be successful or even appropriate in various situations. In coteaching with others, the isolation of practice and some of the idiosyncratic aspects of traditional student teaching models were challenged.

The interns also participated in on-going interactions and communication with coteaching participants across the larger coteaching community of practice. These interactions occurred in cohort groups such as carpools, and professional community networks comprised of both interns and cooperating teachers in both informal and formal settings (such as lunch, social events off campus, faculty and departmental meetings, and whole group on-site Seminars). These larger teaching networks provided different forums for learning about professional interactions within the larger community, and for the networked sharing of ideas. For example, both Luke and Julie used one of Amanda’s suggestions and had their students work on an “adopt an element” project as part of their Coordinated Science II chemistry units (Fieldnotes).

Interns also participated in other professional communities such as the larger professional community of Biden High, state science organizations, national science
organizations, a professional conference, and also other high schools within the area as they interviewed for faculty positions. These professional communities provided another lens into the work of teachers and teachers’ lives and added additional layers to the interns’ developing identities as teaching professionals. The implications of these experiences will be further explored in future research and publications.

This chapter and the one that preceded both presented discussions about the community level experiences of interns within the coteaching community of practice. Discussed were implications of these experiences towards their learning and development as high school science teachers. The next two findings chapters present analysis of interpersonal interactions between the Anatomy and Physiology micro-community in order provide insight into how interpersonal interactions afforded learning opportunities for the interns as they cotaught at Biden High.
CHAPTER 6
ENVISIONING AND RE-ENVISIONING PLANS FOR PRACTICE:
INTERPERSONAL PROCESSES OF MEANING MAKING IN AN ANATOMY &
PHYSIOLOGY COPLANNING MEETING

In Chapters 6 and 7, I examine interpersonal interactions and learning affordances
(Little, 2003) situated within the plane of interpersonal development (Rogoff, 1995).
Specifically, I examine the interpersonal processes of learning and meaning making (Gee
& Green, 1998; Little, 2002, 2003; Suthers, 2006) that were utilized by one exemplary
micro-community during the early weeks of coteaching. In these chapters, I reflect upon
how these experiences impacted the group across time. Finally, I consider implications of
these practices in regard to the ways that these interactions afforded learning
opportunities for participants.

Prior research about professional learning communities and communities of
practice has focused on issues related to developing, sustaining, and evaluating the
quality of such groups (Grossman, Wineburg, & Woolworth, 2001; Little, 2002; Wilson
& Berne, 1999). However, it has been noted that further research is needed to understand
group dynamics and the processes that support member learning (Horn, 2005; Little,
write,

While the idea of members of a team being able ‘to suspend assumptions and
enter into a genuine “thinking together” ’ (Senge 1990: 10) may be extremely
appealing, what does this mean when colleagues actually get together? What is it
that opens up the ‘thinking together’ and, indeed, ‘learning together’ rather than
‘this is how you could do it better’? It is the subtle nuances that we need to understand. (Stoll & Louis, 2007a, p. 6)

In Chapters 6 and 7 the group interactions of the Anatomy and Physiology micro-community are examined in order to illustrate how learning was afforded within these coteaching experiences. In this chapter I argue that the coteachers’ plans for practice shifted numerous times as they developed their plans for instructional practice and moved towards implementation. Then I argue that the ways that the coteachers interacted and the specific conversational practices they utilized throughout their ongoing exchanges helped to push their thinking about practice and enabled them to envision (Kennedy, 2006) how their plans would play out in the classroom. These data illustrate the ways that productive coteaching groups think and work together and support arguments that collective learning experiences can be valuable because they enable participants with opportunities to explain, examine and reexamine their ideas about practice and to push each other to develop alternative possibilities for their work together. Across chapters 6 and 7 I argue that coteaching experiences afford rich opportunities for thinking about practice and the work of teachers.

This chapter begins with a quick review of the research methodology used for these analyses and a discussion of the context of the specific data set analyzed. Presented next is a primary analysis of the multiple plans for practice that the coteachers constructed as they developed their instructional plans about the muscle. Discussion that follows then examines four different participation structures that the coteachers used as they revised their plans for practice. This chapter concludes with discussion of the
implications of these findings and connections to issues of teacher education and teacher learning.

**Background and Context**

As described in the methodology chapter of this dissertation, this chapter and the next differ from the previous two methodologically. A brief review of the methodological approaches for these particular analyses follows. However, for a more thorough description of the methods employed for Chapters 6 and 7 please refer to the discussion of research methodology in Chapter 3.

Drawing upon Gee and Green’s (1998) approaches for studying meaning making within a socio-cultural framework, a *logic-of-inquiry* methodology is utilized. For these analyses, discourse analytic methods are merged with ethnographic methods. This analysis utilizes a *slice of life* data set (Gee & Green, 1998) which is a sub-set of the larger ethnographic data set. The slice of life data set studied for these chapters is comprised of all of the data across the coteaching semester connected to the Anatomy and Physiology micro-community’s experiences related to the development and implementation of their muscle unit with particular attention to their opening lessons. This slice of life data set was selected for analysis because it included each of the types of data sources collected within the larger study and spanned the five months of data collection (February-June, 2005). Additionally, the experiences of the Anatomy and Physiology micro-community were chosen for study due to the coteachers’ strong cohesive (Siskin, 1994) group dynamics. This data set provides many rich examples of
the ways that successful coteaching groups worked together within the coteaching model. While not all groups in the larger coteaching community were as tightly bound, the participation structures identified through these analyses were also present to some degrees in the practices of the other micro-communities.

This chapter utilizes discourse analysis with a focus on semiotics (meaning making) as an analytic framework (Gee & Green, 1998). Primary analysis of the slice of life data set resulted in the creation of a trajectory of practice (Little, 2002, 2003). The trajectory of practice plotted the changes in the teachers’ plans for practice to explicate how their plans for practice shifted through their ongoing interactions of practice. Once the trajectory of practice was created, a secondary analysis was conducted to examine the processes of meaning making and ways that participants negotiated the shifts in plans for instruction. These processes were studied across time to develop an understanding of how the participants negotiated new meanings for their work as a collective. Such analysis is valuable because it enables us to understand how the group constructed meaning and collectively developed new understandings for practice. These negotiations and ways of interacting provided opportunities for the teachers to examine and rethink how they intended on approaching their work.

The slice of life data set used for this analysis begins with a portion of an Anatomy and Physiology coplanning session that occurred on a professional development day on the ninth day of the coteaching experience. The coteachers were seated collectively around a table in the classroom. On the table were two editions of the textbook, plan books and calendars. There were materials that Patsy (cooperating teacher)
had used when she previously taught the unit and also materials that Samantha and Sean (interns) had brought to share with the group.

During this coplanning meeting the Anatomy and Physiology teachers planned the beginning of their upcoming muscle unit. Central to their instruction was the smallest unit of striated muscle, the sarcomere. These structures are the site of muscle contraction. (See figure 6.1 for an illustration of a muscle sarcomere.)

Historically, Patsy had assigned a labeling worksheet that the students had completed using their textbook as a reference. After students completed the worksheet, Patsy typically expanded upon the content material in a class lecture and informal classroom discussion about the parts of the muscle. Sean, however, had found an alternative approach for opening the unit that he had brought to the coplanning meeting. The coteachers’ coplanning conversation centered on the best pedagogical approach for beginning the unit. Throughout the coplanning meeting the coteachers continued to focus on the best way to begin their instruction about muscles; however, their plans for practice shifted across time to consider different constructions of knowledge (i.e. teacher delivery
models of knowledge, constructivist, part-to-whole vs. whole-to-part approaches to the content), different roles of the teacher (teacher as expert—“knower” vs. teacher as facilitator) and students (passive vs. active learners), instructional objectives, and different views of practice (such as teacher-centered or student-centered pedagogy). Because the coteachers’ practice across this entire slice of life data set focuses on instruction about the sarcomere, throughout these chapters I label the data set and the Anatomy and Physiology coteachers’ experiences connected to these lessons as the sarcomere coplanning meeting, the sarcomere slice of life data set, and the activity that resulted the sarcomere model-building activity, etcetera.

The section that follows presents the first analysis developed for this fine-grained analysis of the coteaching experience. Specifically, it presents the ongoing negotiations of the coteachers’ plans for instruction about the sarcomere. Their evolving plans are presented as a trajectory of practice that is used to represent their changing plans for practice as the coteachers worked together develop the sarcomere lessons. The trajectory of practice is then reanalyzed to develop understanding of the processes that the coteachers utilized to reconstruct their plans and develop new understandings for their practice.

**Shaping and reshaping plans for instruction: A trajectory of practice**

As stated in the previous section, the coteachers’ discussion of instruction for the muscle unit began with consideration of Patsy’s previous practices which began with students reading the Anatomy and Physiology textbook and labeling a worksheet on the
parts of the sarcomere. Sean, however, had found an alternative hands-on activity that he presented to the group. This activity entailed requiring the students to construct a model of the sarcomere using pipe cleaners. As one can see in the excerpt from the coplanning meeting below, when Patsy led off the discussion saying that the group would start the unit with reference to the labeling worksheet, Sean questioned whether or not they were going to use the worksheet. His question started a debate among the coteachers about how to shape their plans for instruction. Together the coteachers debated the best approach for practice and examined the ways that their options would impact student learning and outcomes. Across the course of the coplanning conversation, the coteachers’ revised their plans for beginning the unit many times and again as the coteachers moved the plans into practice.

The initial opening of the transcript from the sarcomere coplanning meeting is below. This is followed by a trajectory of practice analysis of the evolution of the coteachers’ instructional plans present in this section of meeting transcript. In keeping with traditions from discourse analysis, line numbers from the original transcription are included on the left side of the text. These are then used as points of reference in the discussion that follows.

Excerpt from transcript of Anatomy and Physiology coplanning meeting:

February 17, 2005

7  PATSY: [Indicating to the labeling worksheet.] We said we were going to use this as well, and then we will have them actually go through the parts –  
8  SEAN: // [Inaudible] what you would like–but are we going to give them that?  
9  PATSY: Okay, okay.//
SAMANTHA: // Thursday and Friday? //</p>
PATSY: All right. So do we want to get started? We need to play with the –
SEAN: // Yeah, the pipe cleaners.
PATSY: To see if it works, but do we put that as a possibility maybe?
SAMANTHA: We could put it down as optional.
PATSY: Um hmm.
SEAN: Do you think we do that Wednesday, or do you think we do that Thursday?
PATSY: I do not think –
SAMANTHA: Wednesday is the test –
PATSY: I know that there will be time. I guess what we need to figure out is would that help?
SEAN: // [Inaudible] yeah that is –
PATSY: Before they do the handout, or leave it until after the handout and then try to build to the challenge. I think we could do it almost like a –
SEAN: // and do not tell them. Just give them the pipe cleaners.
PATSY: Give them the pipe cleaners and say you have this many pipe cleaners. Your challenge is to build a working –
SEAN, SAMANTHA, PATSY: // Sarcomere.
SAMANTHA: So why don’t we do that on Thursday, then?
PATSY: And we will see how that goes –

This was a brief exchange, yet the interlayered, reflexive talk (Fairclough, 1992; Gee & Green, 1998; Lemke, 1992) shows eight shifts that illustrate the coteachers’ thinking and the ongoing development of plans for instruction. Specifically, three different conceptions of practice were considered:

1. Having students refer to their textbook and label the parts of a sarcomere on a worksheet (Lines 7-8);

2. Having the students build a representation of the sarcomere using pipe cleaners to represent the different components (Lines 9-23);

3. Having the students construct a three dimensional working model of a sarcomere (Lines 23-30).

Despite the multiple considerations and shifts in conversation, teacher talk across these exchanges was tightly intertwined and overlapping. Discussion was rapid and ongoing
without much apparent time for reflection. Yet inside this space, the coteachers made decisions and raised questions and concerns, and thereby indicated that they were thinking about the potential ways the activity might manifest in practice.

Figure 6.2, below, displays the eight points of development in the coteachers’ evolving plans for instruction that are presented in the transcript above. Analysis represented on the flow chart shows decisions made and questions raised as well as the coteachers’ evolving plans for practice. These points are then discussed in the text that follows.

**Evolution of instruction: Sarcomere trajectory of practice I**

1. Start unit by having the students work with a worksheet and label the parts (Patsy, Lines 7-8)

2. Question use of labeling worksheet: Should the students build a two dimensional model using pipe cleaners to represent sarcomere parts instead? (Sean, Line 9)

3. Need to test out the activity “to see if it works” (Patsy and Sean, Lines 12-14)

4. Consider pipe cleaner model building activity despite not knowing if it works (Patsy and Samantha, Lines 14-16)

5. Question of timing: Do we do this on Wednesday (after the test), or on Thursday? (All, Lines 14-20)

6. Question regarding student learning: When would the model building activity contribute the most to student learning—before or after students complete the labeling worksheet? (Patsy, Lines 20, 21, 23, 24)

7. Think about using the activity as an open-ended (inquiry-oriented) challenge where the students are asked to construct working models of sarcomeres

8. Decision to do the challenge activity in which students construct working models on Thursday

9. Commitment to the challenge activity, despite uncertainty about how it will go. (Line 30)

*Figure 6.2. Developing the sarcomere lesson plans: A trajectory of practice*
As the coteachers discussed their evolving plans for instruction, differing ideas about what practice would look like and practical questions about potential practice arose. The notion of visualizing, or envisioning practice was prevalent across all coteacher conversations and interactions about practice. As will be argued across this chapter, as the teachers considered ideas for practice and renegotiated new ones they envisioned how their ideas what would manifest in the classroom. Kennedy (2006) has identified this process of envisioning practice as an important part of teachers’ planning process. She writes,

> Planning is not a linear process that moves from instructional objectives to instructional strategies but rather, a process of envisioning in which teachers ‘see’ what will happen... Each unit, each lesson, each activity, is like a play with different characters playing different roles, with a problem at the beginning and a denouement at the end. (p. 207)

Embedded within the coteachers’ exchanges and ongoing visualizations and re-visualizations throughout the slice of life data set are ongoing opportunities to consider possibilities for learning and thinking about the implications of differing plans. Each of the three proposed plans for practice identified above embodies different implications for coteachers and students in regard to classroom practice and potential learning outcomes. In the paragraphs that follow I discuss the implications of each of the different plans. Then I link the coteachers’ exchanges to teacher concerns that Kennedy (2006) has proposed are always addressed in any teachers’ plans for instruction. Across these
discussions I address the value of the implications of the coteachers’ exchanges for opening up opportunities for learning and thinking about practice (Little, 2002, 2003).

Considering different plans for practice

The coteachers could have easily followed Patsy’s typical classroom practices of opening a unit with an anatomical labeling worksheet pertaining to the new unit of study. By sharing a new potential activity and suggesting that it be used as part of the beginning of the unit, Sean introduced the possibility for new classroom practices and opened up a pedagogical discussion about classroom practice, pedagogy, and student learning.

In this excerpt, three different plans for practice are considered as the entrée into the muscle unit. Plan I—Independent student work labeling the sarcomere parts on a worksheet and use of the textbook; Plan II—Hands-on construction of a model of the sarcomere components (connections to the textbook and classroom lecture are not vocalized in the data excerpt); Plan III—Teachers use Plan I and then students are asked to construct a three dimensional “challenge” working model of a sarcomere to apply and extend their working understanding of the material.

Decisions about how to begin the muscle unit have different implications in regard to pedagogical practices, teacher and student roles and conceptions of knowledge and learning. The teachers could have begun the unit through a traditional approach by assigning reading, followed by the completion of a labeling worksheet and a classroom lecture to reinforce or extend the information. Alternatively, they could have begun with a model building activity, which when used as an introduction to the muscle unit and the
parts of the sarcomere could have become an exploratory constructivist exercise.

However, if the students had completed the labeling activity first and then constructed a three-dimensional working model of the sarcomere, students would have engaged in a hands-on application of information with potential to extend their understandings and explore how the various components of the muscle unit interact and function. Each of these different possibilities embodied different implications for practice and posed different potential outcomes regarding classroom practice and student learning. The teacher and student roles, nature of the construction of knowledge, assumed learning process, and potential outcome of the lesson as described above are summarized in Table 6.1.

Table 6.1. Implications of different instructional plans

<table>
<thead>
<tr>
<th></th>
<th>Plan I: Labeling worksheet</th>
<th>Plan II: Two dimensional model building activity</th>
<th>Plan III: Three dimensional model building “Challenge”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anticipated outcome</td>
<td>Students identify sarcomere components on a worksheet (Anatomy emphasis)</td>
<td>Students construct two dimensional models sarcomeres (Anatomy emphasis)</td>
<td>Students apply and extend information to create three dimensional models of sarcomeres (Anatomy and Physiology)</td>
</tr>
<tr>
<td>Philosophy about learning</td>
<td>Transfer of knowledge: Students to learn and process known facts and information</td>
<td>Constructivist: Students learn about anatomy through the manipulation of materials and construction of a model</td>
<td>Inquiry/Hands-on: Students apply and extend knowledge through the creation of a three dimensional moving model</td>
</tr>
<tr>
<td>Pedagogy</td>
<td>Fairly traditional approach: Teacher assigns reading and worksheet assignment then</td>
<td>Teacher provides materials and facilitates activity in which students manipulate activities</td>
<td>Merges traditional approaches with hands-on application. Teachers will</td>
</tr>
<tr>
<td>Teacher role</td>
<td>Teacher as experts</td>
<td>Teachers as facilitators of the activity</td>
<td>Teachers as experts and facilitators</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Student role</td>
<td>Students as “passive” learners. Students utilize textbook to support completion of worksheet; Manipulation of known information</td>
<td>Students as active learners. Students manipulate materials to construct an understanding of the sarcomere components</td>
<td>Blend of passive and active roles. Students learn in traditional ways, then apply/extend understanding through hands-on challenge activity</td>
</tr>
<tr>
<td>Epistemology (Construction of knowledge)</td>
<td>Transfer of knowledge; Information centered in textbook, teacher as expert</td>
<td>Constructivist</td>
<td>Information to be learned, applied and manipulated. Teachers are experts and students construct knowledge</td>
</tr>
</tbody>
</table>

As coteachers’ plans for practice were considered during the coplanning meeting and during implementation, pedagogical epistemological orientations shifted as did the roles of participants and learning outcomes for participants. Additionally, as the coteachers considered various pedagogical approaches they discussed practical aspects of practice and concerns that arose during their conversation. Kennedy (2006) has argued that teacher concerns about practice are central considerations in teachers’ decision-making process about practice. She identifies six concerns and argues that teachers need to address these needs in order to make their practice both successful and manageable in classroom settings.
In this short excerpt, four of the teacher concerns that Kennedy has identified (2006) are raised—“fostering student learning,” “maintaining lesson momentum,” “attending to their [teachers] own cognitive and emotional needs,” and “covering desirable content” (p. 205). Pasty raised the issue of student learning (Lines 20, 21) when she asked about the best placement and utilization of the activity — “I guess what we need to figure out is would that [the activity] help... Before they do the handout, or leave it until after the handout (Lines 20-21, 23-24). Referring to lesson momentum, timing is discussed by all the coteachers (Lines 14-20). Teachers’ “cognitive and emotional needs” are raised by Patsy in her multiple comments about the uncertainty surrounding the activity. She first mentions that they will need to test out the activity “to see if it works” (Lines 12-14) and once the group commits to doing the challenge activity, she states “And we will see how that goes” (Line 30). Finally, concerns about covering desirable content form the center of the conversation although these are addressed least explicitly. Clearly, the coteachers intend on teaching the students about the parts of the sarcomere; discussion of functionality (the process of muscle contraction) is also considered. This content is the goal of the opening lessons. The central question of debate, however, is the best way to address this content in the classroom while supporting student learning.

These concerns although briefly mentioned here were also further explored across the rest of the slice of life data set and by coteachers throughout the semester. As Kennedy (2006) has argued, typical university based visions-of-practice do not encompass the full range of teacher concerns as a regular part of teacher education. The coplanning lessons and data from the larger study, however, show that through the
ongoing engagement in practice and conversations with coteachers, the interns are able to learn to talk about and address each of Kennedy’s concerns and learn how to navigate them in their practice. Additionally, the interns participated in the cultural practice of envisioning and anticipating practice throughout the coteaching semester. As is illustrated in this analysis, such a process is dynamic and linked contextually to both instruction and students. Kennedy has argued that teacher educators’ images of practice are typically decontextualized from real classrooms, which limits their ability to help preservice teachers develop their practices. These findings illustrate ways that that the coplanning experience can extend teacher education coursework experiences and supplement academic learning with the cultural practices and Discourses (Gee, 1992, 1996) of classroom practice.

Across the entire sarcomere slice of life data set, the coteachers explored numerous possibilities for the sarcomere activity. Implicated in each of these plans were different visions for student learning, teacher practice, and different approaches for addressing concerns toward practice. As the teachers renegotiated their practice and adjusted their plans they explored multiple possibilities for shaping the curriculum. They also asked questions about curriculum scope and sequence, and tried to anticipate and shape practice in ways that will best support student learning and successful implementation of instruction. Through the work of curriculum development they explored a range of questions about practice and constructions of the role and work of “teacher” thus affording multiple sites for learning about teaching. The figure below identifies nine of the variations of the sarcomere model building activity that the
coteachers considered. This information is presented because the secondary analysis that follows here and in Chapter 7 draw on the coteachers’ interactive experiences across the sarcomere data set as a whole. This table does not present all of the possibilities that the teachers considered but rather seeks to illustrate the starting and ending points of the instructional plans and the variations that were discussed within.

**Shifting plans for practice: Sarcomere trajectory of practice II**

*Starting idea, historic precedent*

Start unit by having the students work with a worksheet and label the parts

Don’t use the labeling worksheet, instead have the students construct models of the sarcomere and its parts using pipe cleaners

Make the activity an open-ended exploration of sarcomere structure through small group inquiry-based constructivist oriented model building activity

Students brainstorm in groups to develop a plan for model building

Whole class discussion/sharing of plans to form collective understandings

Try the more open approach with period 1, then if it does not work move to more directed approach (Plan B) as necessary with later classes

Need to discuss limitations of pipe cleaner models as part of instruction

Use of visuals (video animation) to support student understanding of concepts

Teachers collect materials and experience difficulties when they actually attempt to build their own models. Expectations for student models shift from three-dimensional moving models to two-dimensional static models. Moving models become extra credit

**Final decision:**

Students will begin working with reading and the labeling worksheet for homework. Class will begin with a review of the homework and classroom discussion to expand understanding of content material and discussion of functionality of the sarcomere. Small groups will then brainstorm and construct models of sarcomeres to demonstrate their understanding of anatomy (and physiology—for extra credit) of the muscle unit.

*In the classroom with students*
Lesson goes well. Positive student response during first period eases coteacher concerns about the viability of the activity.

Students work in groups to develop plans for constructing sarcomere models and then construct their models in class the following day. Most student groups construct moving sarcomere models. Coteachers are enthused by outcomes.

*Figure 6.3. Shifting plans for practice: Sarcomere trajectory of practice II*

Through the process of examining and reexamining their plans for practice, group members created a rich arena for examining their practice and thus afforded opportunities for learning within the context of their practice. Discussion of the coteachers’ processes for meaning making and the implications of their interaction patterns follows.

**Conversational participation structures: A meaning making process**

The sarcomere trajectory of practice II identified nine plans for practice that the teachers’ considered. As Gee and Green (1998) write, “once participants’ constructions of practice are identified one can move inside these developments to understand the processes that participants used to move from one plan to the next” (p. 137). Little (2002, 2003) has argued that teacher interactions about practice situated within workplace contexts can afford participants with opportunities to consider and reconsider the multiple possibilities for practice and to learn about their work. Lave and Wenger (1991) argue that similar interactions across workplace communities of practice provide opportunities for learning the cultural practices of the community. A central concern for this chapter is understanding how such learning opportunities are afforded through participant
interaction. A secondary analysis of the coteachers’ multiple visions for practice, as represented on the sarcomere trajectory of practice II, revealed that participants utilized multiple conversational practices to envision potential plans for practice. The conversational practices that the participants utilized throughout their coplanning meeting enabled the coteachers to make sense of their developing plans for practice and to anticipate potential problems that might result from their plans and to anticipate how the plans would unfold in the classroom. Together they also questioned one another’s ideas, pushed for further clarification, and visualized their anticipated work together. The process was recursive and dynamic, and very much punctuated by a sense of collective responsibility and energy for creating a plan that would best support student learning.

Analysis presented in the section that follows is used to describe approaches that the coteachers utilized to visualize and anticipate how their plans for practice would manifest in the classroom. These participation structures formed a bridge between one vision of practice to the next with the coteachers typically revising their ideas as they anticipated how their plans would manifest in the classroom. In this section it is argued that the coteachers’ conversational practices provided rich opportunities for thinking about practice and supported the teachers’ learning as they co-constructed their plans for instruction. In the sub-sections that follow, I discuss four different participation structures that were apparent across the Anatomy and Physiology coteachers’ coplanning interactions. These conversational practices include: problematizing and problem solving plans for practice, clarifying plans, and rehearsing and blocking visions of practice. Across these sub-sections it is argued that each of these practices opened up opportunities
for the coteachers to learn about teaching and helped to support the development of the group’s plans.

Problematizing visions of practice

Problems of practice were discussed many times during the coplanning session. Problems of practice were perceptions of anticipated dilemmas that arose as coteachers developed their instructional plans. As they anticipated potential dilemmas and shared the coteachers challenged ideas, questioned plans, and identified concerns. Through these exchanges they pushed each other to talk about practice, problem-solve and create alternative solutions. As Brown et al (1989) write, “Groups are not just a convenient way to accumulate the individual knowledge of their members. They give rise synergistically to insights and solutions that would not come about without them” (p. 40). As group members problematized their work, alternative lenses for practice were opened up and problem-solving exchanges were prompted. This was a collective process of meaning making that afforded participants with new venues for interpreting, understanding, and shaping their practice and led to the construction of alternative plans for instruction. Also, these exchanges demonstrated how the coteachers collectively developed their plans and showed how they envisioned their plans in action.

Conversations about problems of practice have the potential to stimulate rich “generative” discussions and lead group members to develop new understandings of practice (Ball & Cohen, 1999; Brown, Collins, & Dugiud, 1989; Freedman, 2001; Little & Horn, 2007). Little (2003) explains that situations such as when “a group of teachers
reserves time to engage in mutual problem-solving [or when] a teacher discloses a problem of teaching practice and publicly accepts responsibility for helping students by revising her instruction” can be “thought to embody the ‘optimistic premise’ of teacher learning community” (p. 40). Others have identified problems as a stimulus for group participants to develop new interpretations of situations or practice. This analysis builds on these understandings.

Once the coteachers agreed to do the model building three-dimensional challenge activity (Lines 29-30), their conversation rapidly shifted to the plausibility of the modeling activity with each group member immediately voicing different concerns.

29 SAMANTHA: So, why don’t we do that [the challenge activity] on Thursday, then?
30 PATSY: And we will see how that goes –
31 SEAN: Will they be able to –
32 SAMANTHA: // [Inaudible – I think it’s a] difficult concept.
33 PATSY: Part of it is going to be, it is, and part of it is going to be we may be limited by costs. And once we go out and see how much that is –

Concerns about pedagogy, resources, student ability and student response to the activity are common concerns that teachers have about implementing open-ended or inquiry-based activities. Will the students be able to work with materials to accomplish the goal? Will they be able to understand the concepts? Is this activity going to require a large out-of-pocket expense? Each of these points reflect some of the dilemmas science teachers must confront when engaging in hands-on inquiry based pedagogy and reflect known barriers for teachers trying out such instructional approaches. What is noteworthy in the Anatomy and Physiology group’s interactions, however is that instead of allowing the issues to derail their decision to have students construct models of sarcomeres, the
coteachers shifted into a problem-solving exchange and collectively brainstormed ways
to address their concerns. After vocalizing their concerns these coteachers shifted into a
problem-solving mode and worked together to figure out solutions for practice.

Little and Horn (2007) call the tendencies of teacher communities to acknowledge
and reconcile problems of practice as a normalizing practice. When teachers raise
problems of practice in discussion, dialogue may either “[turn] a conversation away from
the teaching or toward the teaching as an object of collective attention” (Little & Horn,
2007, p. 82, italics in original). The authors argue that teachers typically use normalizing
practices to “supply reassurance… and establish solidarity” (p. 81). Frequently when
groups position a dilemma of practice as typical or accepted, opportunities for examining
alternative approaches or underlying issues are closed down (p. 82). However
normalizing practices can also serve as a “bridge to more probing investigation of
teaching and learning” (p. 91) thus shifting conversation towards an examination of
practice and an imaging of possibilities. In such instances, “teachers treat the shared and
expected (normal) character of a problem as the starting point for detailed discussion of
specific classroom instances and as a means to help anchor emergent advice to more
general problems and principles of teaching” (p. 82). When this occurs pedagogical
reasoning becomes public and participants begin to share ideas for addressing situations,
thus collectively fostering the development of alternative ways to understand and
approach problems of practice. Little and Horn argue that the way that group participants
respond to problems in practice appears to reflect group culture. Normalizing practices
that lead to examinations of practice are rare and tend to occur in groups with a strong commitment to “learning in and from the classroom practice of its members” (p. 89).

As noted by Little and Horn, groups usually normalize problems of practice by identifying them as typical dilemmas for practitioners. Such responses effectively dismiss concerns and close down opportunities for conversation. In contrast, the coteachers’ discussion was an ongoing negotiation of plans for practice that could be characterized as meaning making process situated in the shifting back and forth between envisioned problems of practice and collective problem solving. Such conversational patterns, “[open] up opportunities for learning in, from, and for practice” (Little and Horn, p. 81). After identifying three concerns about their plans, the coteachers continued to problematize the activity while simultaneously exploring possibilities for addressing their concerns. The coteachers’ ongoing problematization of practice and the possible solution that they developed is excerpted below.

35 SEAN: // but do you think? –
36 PATSY: I do not think pipe cleaners are expensive.
37 SEAN: No, I think, I mean, I –
38 SAMANTHA: // just for each class, though, that is the thing.
39 SEAN: But now –
40 PATSY: // I am wondering if we can re-use them or –
41 SEAN: // Do you think the students will be able to– I would not know how to make the two circles. You know what I mean?
42 PATSY: I don’t know. What do you think? Can we give them some directions?
43 Should we give them the idea?
44 SEAN: I just do not know if I will be able to put, like, if you say give me 8 pipe cleaners or however many you need –
45 PATSY: // Uh hmm.
46 SEAN: [Continues] // and say, make a sarcomere, I do not think I would be able to sit there and be able to be like, okay, well this is how I have to – you know?
47 PATSY: Yeah. I mean, that is probably challenging – the funny thing is the things that [I think the] kids are not going to have any clue what to do with, or if I would
have been clueless—those are the things they tend to really excel at. So, it is kind of
do we want to chance it this early and take that risk? This is a hard thing to do.
SEAN: // So, I mean, we could have them brainstorm it—“How would you build
it?” Give them the materials. Say, “Okay, maybe write out a plan of what you are
going to do.” //
PATSY: // Uh hmm.//
SEAN: // And then go over the plans with them—
PATSY: // And then as a class you can have them share, and say, “What is this side
on—?”
SEAN: // and then if none of them get it then we tell them how to build it. You know,
like that—

The excerpt above illustrates four interwoven problematizing and problem solving
exchanges. The coteachers first focused on the cost of supplies13. It began with Patsy
misinterpreting the beginning of Sean’s question about student capability to be about the
cost of materials (Line 35). She responded, “I do not think pipe cleaners are expensive”
(Line 36). Samantha added that the quantity needed for all five of their classes might be a
larger issue. Patsy’s response, “I’m wondering if we can reuse them” (Line 40), offered a
way to diminish costs and built on Samantha’s comment. While not an earth-shattering
conclusion, the conversation above illustrates what Little and Horn (2007) call the
“generative power of a teacher community” (p. 80). As a group through both the
misinterpretation of one member’s questions and the layering of ideas these teachers
constructed one way to keep down the potential costs of the activity. This provides an
example of how the coteacher’s discourse was layered and a co-generative process of

13 As Patsy’s comment illustrates, the teachers do not believe that pipe cleaners are expensive. The larger
issue here is the on-going cost of supplies for hands-on activities that the teachers incur on a regular basis.
The issue is dismissed fairly quickly here, but it becomes a concern that enters the intern cohorts’
“Discourse” (Gee, 1992, 1996) as the semester continues (Fieldnotes; Samantha, May Interview).
meaning making. The other problematizing/problem-solving exchanges embedded in the excerpt above also illustrate the generative nature of the teacher discourse.

During the above exchanges Sean twice reiterated concerns about whether the students would be able to construct the model (Lines 41-42, 45-46). In response Patsy first suggested a possible solution—making the activity more directed in order to help support student success. “I don’t know. What do you think? Can we give them some directions? Should we give them the idea?” (Lines 43-44). Patsy’s statements provided a prompt for group-members to think of alternative conceptions of practice and opened up the possibility for teachers to direct the student model building activity.

As is indicated by Sean’s responses (Lines 54-56, 58, 61), Pasty’s comments had helped him think of possibilities for addressing the problems. Drawing on her ideas Sean suggested ways to scaffold the students’ experience in order to increase potential for successes. His suggestion addressed both his concerns about the difficulty of the activity and Patsy’s comments about risk. Posing the possibility that the students might brainstorm the activity and create a plan prior to constructing the model (Lines 54-56), potentially provided support structures and scaffolding for student work and also allowed teachers with the option to provide students with plans for building the model if necessary.

These exchanges illustrate how as a collective the Anatomy and Physiology coteachers worked to diminish potential problems of practice (the potential level of risk regarding the activity) and collectively reconceptualized their plans for practice. What is central to understand is that throughout the process of problematizing and problem
solving these teachers continued to re-envision their practice and examine and problem-solve potential problems embedded within their instructional plans.

Throughout the coplanning session, these coteachers identified over fifteen potential pitfalls in their tentative plans, yet these coteachers addressed the dilemmas as they arose in their discussion. In each instance, coteachers utilized perceived problems of practice as starting points for exploring alternative ways to interpret and implement the activity. Again and again, the process of identifying a dilemma served to open up an opportunity to reexamine and re-envision their plan for practice, and together the coteachers created new ideas for what their practice would look like. The coteacher exchanges highlighted across this problematizing section illustrate the “distributed nature of teachers’ reasoning” (Horn, 2005, p. 229) and show how conversations can serve as resources for reasoning about pedagogy and supporting one another’s practice. It was found that as the coteachers anticipated potential problems, they collectively illuminated others and provided each other with new lenses for examining their plans for practice. Each of these problematizing cycles led the group through a process where they reexamined proposed plans, shared strategies and information, and worked to address the problems.

The problematizing/problem solving exchanges were part of a recursive process in which coteachers continued to adjust and negotiate their plans for practice while gradually moving towards a plan that they all believed would work better in practice. In problematizing plans for practice coteachers needed to imagine the potential of their plan, begin to anticipate how it would manifest in practice, and be willing to vocalize potential
dilemmas that they foresaw. This was one of the ways that the coteachers challenged and adjusted their plans for practice. Another was through the conversational practice of clarifying their plans.

*Clarifying visions of practice*

Several researchers who use sociocultural learning theories to understand the community process write about ways that communities of learners work together to “kneed” ideas (Feiman-Nemser & Beasley, 1997, p. 119), add explanation (Gee & Green, 1998), perform “intellectual midwifery” (Grossman, Wineburg, & Woolworth, 2001, p. 984), or “repair” understanding (Little, 2002, p. 923). Common to each of these descriptions is the collective process of group members in developing ideas by encouraging one another to extend or restate their ideas, or work to clarify statements. Sometimes this is borne out of confusion or uncertainty, yet essential to the process is the clarification of meaning. The effect of each of these interactions is the on-going construction of situated, collective understanding and the clarification of the current vision for practice. As Little (2002) writes, “In ordinary social discourse, the occasions when individuals ask questions, pose problems or broach troubles often serve to expose a group’s taken-for-granted and tacit expectations, assumptions and ways of being—precisely because they tend to provoke efforts at ‘repair’” (pp. 922-923). The Anatomy and Physiology coteachers clarified their plans through multiple routes. One approach was by asking questions or by making statements that prompted others to reflect on their ideas. Typically, participants then clarified or changed their thoughts about practice.
Samantha in particular played a central role in prompting group members to clarify ideas. Despite being ill and quieter than usual, Samantha played an important role in the group process of clarifying plans and goals during the February 17th coplanning session. In this coplanning session one of the central ways Samantha helped shape practice was by asking poignant questions that prompted further discussion and encouraged group members to clarify their interpretations of plans or further expand on ideas.

For example, Samantha focused the group’s attention on the purpose of the model-building activity several times during the conversation. Twice Samantha asked questions about what students needed to know prior to participating in the model building activity. “So we are not going to go into how the muscle contracts and relaxes in regards to all of this? Are we basically sticking to just this [the basic structure of the muscle]?” (Lines 241-242). While Samantha was asking the group for clarification of plans, she was also clarifying the objectives of the activity – the emphasis of muscle parts versus also addressing functionality. Her comments addressed questions about the goals of the activity and alluded to “perceived gaps” (Wickman & Ostman, 2002) in the lesson plans. Emphasis around perceived gaps, became clearer the second time Samantha inquired about what the students need to know prior to constructing the model (Lines 280-281). Her comments initiated the exchanges below and prompted Patsy to reflect on their current plans for practice. Ultimately this led the group change their plans for practice and redirect the goals of the activity:

280        SAMANTHA: But we are not going to be talking about any of this on
281         Thursday? I guess we are just reinforcing it for Friday.
SEAN: What do you mean?

SAMANTHA: The sarcomere and stuff. We are not talking about too much?

SEAN: Oh, I don’t think – on Wednesday

PATSY: // Here’s something – Wednesday we will have done the sarcomere itself, but, although

SEAN: // [Inaudible] Yeah. You are doing just the structure, not really what it does.

PATSY: So we actually– you know what – that is a whole [new idea], because they have never gotten the connection of how they actually break and we have to talk about the slide and film before they can build it.

SEAN: Oh.

PATSY: So the beginning of Thursday is actually going to be a discussion of –

SEAN: // [Inaudible] of, oh it is –

PATSY: We have to talk about that first. That would help – to let them know what they are building.

SEAN: We are talking about the sarcomere, though, and the different parts.

PATSY: Yeah, but we talk about the bands and this one we are going to talk about the bands and we can talk about that when that shortens, when you lose, I think it is the H-zone or whatever it is, but that still does not explain the actual myosin yet.

SEAN: Yeah, that’s true.

PATSY: So I think, maybe Thursday, we need to discuss for part of the period a little bit about the breaking and reconnecting of those cross bridges, and then that actually would allow us, to let them do their discussion. We will tell them, okay now, your task is to try to build this model. Brainstorm and we will probably have them brainstorm by the end of the period maybe at least discuss, hopefully –

SEAN: // Oh, and then on Friday, maybe have them work on it.

PATSY: And then Friday they would be building.

SAMANTHA: And then if they want to bring other things in,

PATSY: [Interrupting] bring in to help build their model – that works.

In the example above, Samantha’s question led Patsy to reevaluate the plan, realize a perceived gap in the plans, and adjust plans for instruction. In this exchange Patsy also linked the planned model building activity back to the content material for instruction while explaining to Sean why covering additional information prior to the model building activity was necessary to support the students’ experience. Grossman, et al. (2001) explain that within mature learning communities group members have
responsibilities to one another. “Listeners have the responsibility to admit their own confusion in understanding members, and speakers have the responsibility to clarify their initial ideas” (Grossman, Wineburg, & Woolworth, 2001, p. 983). They liken this to “a game of bridge in which partners try to understand each other's bids and build upon their understanding of their partner's strengths in order to determine the best possible strategy” (pp. 983-984). Furthermore, Grossman, Wineburg and Woolworth acknowledge that such interactions require particular social skills and cultural stances. They write,

Pressing colleagues for clarification in a public setting requires not only a particular intellectual stance but enormous social skill and careful negotiation to prevent hurt feelings and possible shutdown. Learning to argue productively about ideas that cut to the core of personal and professional identity involves the skillful orchestration of multiple social and intellectual capacities. (p. 980)

While Samantha raised questions about the plausibility of their plans, she did not challenge the group with pointed comments about perceived problems. Rather she sought clarification and clearer understanding of the current manifestation of their plans. Furthermore, Patsy helped negotiate this exchange. Careful to not offend Sean, she explained how the group’s plan needed to be adjusted (Lines 289-309). These negotiations reflected the social skills of group members and also group dynamics that included a willingness to listen to each other and members’ openness to adjust plans in response to one another’s insights.

Samantha played a critical role in focusing and re-directing the coplanning session. Samantha’s prompts and the discussion that ensued effectively shifted the goals
of the activity from one focused on constructing the structure of a sarcomere (as the online model-building directions delineated) to one focused on both form and function of the sarcomere. Her request for clarification effectively led to an expansion of both the scope and goals of the activity as well as the potential learning opportunities for students. However, it was the collective work of the group in reframing their plans that led to new insights about the best way to approach instruction. Through the process of clarifying practice participants were able to expand on their ideas and develop a new vision of practice for the classroom.

These data provide evidence of the power of the collective and importance of each group member in furthering plans for practice. By seeking clarification throughout the coplanning meeting the group was prompted to reflect, “repair” (Little, 2002, p. 923), and further their plans for practice numerous times. Another way that group members clarified plans of practice was through the use of rehearsals (Horn, 2005).

Rehearsing visions of practice

Horn (2005) describes rehearsals as participation frameworks where teachers “act out anticipatory classroom interaction…in an anticipatory fashion” (p. 225). These exchanges typically are comprised of “blow-by-blow accounts of classroom events, often acting out both the teacher and student roles” (p. 225) and “provided a figurative realm for applying and examining general values and principles” (p. 232). Numerous times

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14 Horn’s work presents two related concepts rehearsals and replays. Her analysis predominately focus on replays. Due to the anticipatory nature of coplan conversations, rehearsals are more predominant in my data.
during the coplanning session, the coteachers utilized conversational structures that I identify as rehearsals as a means for practicing dialogue for classroom practice. These *rehearsals of practice* afforded opportunities for participants to talk through their plans and begin to vocalize what they would say and do in the classroom. In this section I argue that these participation structures enabled participants to enact their plans for practice in an anticipatory way and provide opportunities for the interns to anticipate how practice would manifest in the classroom.

For this discussion I draw on two examples where participants utilized this participation framework to strengthen their images of practice and began to develop language for future use in the classroom. In the example presented below, Samantha launches a rehearsal about classroom implementation of the sarcomere model. While this rehearsal began with both Samantha and Sean practicing potential dialogue for instruction, Patsy then assumed the dominant role in vocalizing text for instruction. Additionally, as these exchanges occurred, new ideas for practice were layered into the discourse and plans were further developed.

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SAMANTHA: So we are not going to say, “Build a sarcomere.” We are not going to say that?

PATSY: I don’t think –

SEAN: // We are going to say, “Plan how you would build a sarcomere with the pipe cleaners.”

PATSY: “Here is what you have. Work in your tables and come up with a plan.”

But we are not actually going to hand them the pipe cleaners yet.

SAMANTHA: Okay.

PATSY: And then, “We will give you about 10-15 minutes.” If they come up with a plan, then –

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set. Although not discussed here, rehearsals also occurred in huddles during coteaching instruction as coteachers assessed their practice and conferred on their next steps.
SEAN: Yeah.
PATSY: We will say, “Share with us what your plan is.” And maybe we can come to a consensus of the classes, what might be the best route.
SEAN: //Inaudible//
PATSY: Or, if there is more than one or two ways that we think might work, say, “Okay—
SEAN: //Inaudible//
PATSY: You guys try this. You guys try that.”

These data illustrate a collective rehearsal in which participant voices intermingle to collectively review and extend plans. During the rehearsal, group members continued to develop instruction—trying out potential dialogue for instruction and adding additional layers for classroom practice. The exchange began with Samantha asking for clarification of their ideas. It then shifted to Sean drawing on previous discourse to illustrate what the teachers would do in the classroom. Patsy then led the rehearsal with Samantha and Sean intermittently affirming her comments. Predominantly Patsy reiterated previous discussion, but did so by illustrating the plans with possible language for practice. Additionally she elaborated on the plans further by adding in new ideas that layered upon previous exchanges: “But we are not actually going to hand them the pipe cleaners yet” (Line 88). While she did not clarify her reasoning here, this could have reflected either managerial advice or a way of conserving materials. She then commented that they might get the class to come to a “consensus” (Line 94), single plan, or drawing upon Sean’s earlier comments utilize multiple plans (Line 96). This dialogue is anticipatory, but the discussion provides tangible imagery and enables one to anticipate action in the classroom. It illuminates what Horn (2005) describes as “collegial conversation seemed
to serve the important purpose of providing discursive and interactional tools for actually implementing some of these ideas in their classrooms with their students” (p. 232).

In this rehearsal Patsy played a strong role and provided potential classroom dialogue for the interns. In doing so she helped the interns translate abstract plans for practice into images, and thereby provided an intermediary forum for practice and a space for thinking through possibilities before the participants attempted to put the plans into practice. This example reflects what Horn describes as “[providing]…language that would be directly importable to the classroom” (p. 228). It is important to note that this was not a role reserved for the cooperating teachers alone.

Interns also served as important collaborators in creating meaning for practice and in sharing potential language for classroom use. In the rehearsal discussed in the problematizing section, Sean lead the way in providing potential language for classroom practice. In that rehearsal he also inserted a new idea, the idea of having students brainstorm possible plans. That was an idea that Patsy then picked up and elaborated on.

54  SEAN: // So, I mean, we could have them brainstorm it – “How would you build it?” Give them the materials. Say, “Okay, maybe write out a plan of what you are going to do.” //
55  PATSY: //Uh hmm. //
56  SEAN: // And then go over the plans with them –
57  PATSY: // And then as a class you can have them share, and say, “What is this side on –?”

Across the larger coteaching data set are examples from each micro-community where both interns and cooperating teachers collectively supported the co-construction of practice practice through the use of rehearsals and layered discussions. Horn (2005) writes, “replays and rehearsals formed the basis for consultations, providing evidence
through which to reason about practice” (p. 226). Each of the rehearsals proceeded
discussion in which coteachers problematized their working version of the lesson plans. It
appears that these rehearsals provided participants with opportunities for imagining what
their practice would look like when enacted. Rehearsals appear to have opened up space
for coteachers to imagine how plans would manifest in practice and supported
anticipation of problems that might result. This, in turn, opened up opportunities for
additional problem-solving and consideration of alternative conceptions of practice.

In summary, rehearsals provided interns with potential language to use during
instruction. Rehearsals appear to be particularly useful for coteaching, as coteaching
practice required a unified plan for their practice so that the coteachers could work
cohesively in the classroom. Additionally, rehearsals provided important support
structures for interns early in the semester when they were anxious about classroom
practice. By providing space for imagining future language and actions for instruction
and supporting interns moves from peripheral roles towards more central roles in the
classroom (Lave & Wenger, 1991), rehearsals opened up important opportunities for
participants to anticipate and conceptualize their plans in practice. One final
conversational pattern that was evident across coteacher interactions was another
approach for envisioning practice that I have identified as *blocking*.

“*Blocking*” plans for practice

*Blocking* is a conversational participation framework that, like *rehearsals* (Horn,
2005), draws on theater and dance for its name. The two participation structures are
distinctly different. Whereas rehearsals provide opportunities for coteachers to try out specific language that they might use in the classroom, blocking exchanges are used to depict anticipated practice in broad sweeps by highlighting key actions, checkpoints, or ideas that the coteachers will address in their work together. Both participation structures enable coteachers to anticipate and visualize future practice, however they each serve different purposes and work differently to coordinate coteacher practice.

In theater when actors, directors, and choreographers block a scene, they “walk-through” the major elements of the scene, physically moving across the stage and hitting designated points which may be marked on the stage floor with tape. The scene is abbreviated and key lines and movements are emphasized; actors move through an abbreviated script highlighting key phrases and reviewing motions across the stage. It might look something like this: move downstage, “Blah, blah, Can’t believe you feel that way.” Pivot. Move across the stage to the blue tape, listen for another actor’s response… When blocking a scene, “shorthand” language is used and key movements and ideas are drawn out. The focus is on the flow and motion (fluidity) of the scene.

As Horn (2005) has developed the concept (and as I have developed it further) rehearsals serve as a space for proposing and practicing specific dialogue for practice. These rehearsals provide teachers with opportunities for “rendering classroom events in teacher-to-teacher conversations” (Horn, 2005, p. 225). In conversational spaces these participation frameworks provide participants with an opportunity to develop scripts and vocalize potential texts for classroom practice. This is a space for sharing potential texts for instruction and for practicing future classroom discourse. In contrast, blocking
provides space for participants to overview instructional intentions. It is a space for aligning group understanding, developing a sense of fluidity, and punching key ideas for collective practice. I define blocking as layered conversations where participants coordinate major movements of instructional practice by outlining key ideas in an almost shorthand form. This is a dynamic process of sense making that also accommodates possibilities for modifying plans.

The use of blocking to align group practice was visible within the Anatomy and Physiology’s coplanning session, and was also a mechanism utilized by each of the micro-communities within the larger coteaching community of practice. Blocking provided quick “bulleted” reviews of plans and served to coordinate key understandings during both coplanning sessions and also during huddles (Tobin, 2006; Wassell, 2004) that occurred during co-taught lessons. While blocking exchanges could contain specific details, they were customarily general discussions that did not specify actors but rather addressed the anticipated collective actions and practices of the group. Typically they were used to quickly review decisions and were comprised of a coordination of key events planned for practice. This was accomplished through rapid exchanges that drew on local language and provided a quick overview of the current big ideas for practice. While blocking practices were used to coordinate plans, they also were sites for further development and people often used these spaces to quickly pull together bits of ideas that had been discussed, but not formalized.

One example of blocking occurred during the coplanning session when Samantha prompted the group to review plans so that she could pull together her notes for the
interns’ formal lesson plan that she was responsible for writing that week. She initiated a quick exchange in which the coteachers coordinated their understanding of their current plans. Additionally, Patsy and Sean used this exchange to develop plans for student homework.

SAMANTHA: Okay. So they are just coming up with a plan to build the sarcomere, discuss the plan, then to actually do the plan, and then we will discuss what the limitations are.

PATSY: Uh hmm. They will discuss what worked with their model [inaudible]. [For example they might ask,] are there other supplies we could have used that possibly have made it more realistic?

SEAN: Yeah, just have them look back and reflect on that.

PATSY: // And that could be a reflection overnight. The homework assignment could be go home and think about what materials could have made this a better model.

SEAN: Yes.

In both blocking exchanges presented in this section, the coteachers use locally developed language that they had collectively defined over the course of the coplanning session. These terms include “discuss the plan,” “do the plan,” “limitations,” “their model,” “building,” “brainstormed,” and “the clip.” As readers affiliated with teaching we may infer the meaning of these terms, however for the Anatomy and Physiology coteachers these terms had specific meanings that the group developed during earlier parts of their conversation. These terms reference local cultural practices (Lave & Wenger, 1991), specific types of actions, and specific actors (students vs. coteachers) and illustrate the development of collective group meaning. Furthermore, in the next data excerpt the coteachers use specialized terms specific to the curricular content of the unit and indicative of their content area specialty, biology — which is even more specialized around Anatomy and Physiology. This use of language specific to the community is an
indicator of group membership (Wenger, 1998). However, use of these terms illustrates more than just belonging; these terms are shorthand exchanges of meaning. In these punctuated exchanges the teachers did not ask for clarification of terms, nor did they offer drawn out clarification of meanings. While we cannot be certain no ambiguity existed within the conversation there were clear indicators of assumption of shared meaning in regard to classroom practice and teacher/student action. These exchanges illustrate the group’s development of shared meaning and shared intention for practice.

Later in the discussion Samantha initiated another blocking episode. Once again key actions and points for practice are emphasized. In the previous example the teachers clarified the sequence of activities for practice. Sequencing of activities is again reviewed; however in addition, in this exchange coteachers allocate different events to different days. This conversation is anticipatory, and provides coteachers with a collective understanding of when each event should occur.

SAMANTHA: So Friday we are just bringing everything back to the model of how.
SEAN: // Now they are going to build the model on Friday.
SAMANTHA: Oh, so they are building.
PATSY: And then –
SEAN: And then we can talk about the limitations.
PATSY: So some of that will spill over until Monday, I think – even if we plan for Friday.
SEAN: Well, I mean, if they have already brainstormed –
SAMANTHA: It might not –
SEAN: So does that mean, we planned to do the myosin [inaudible] is now going to move to Thursday, and
PATSY: // You are right.
SEAN: And the reticulum is going in that discussion.
SAMANTHA: And the mode.
SEAN: And the clip would be there, so I think, unless we need more time to brainstorm, that is enough – once they do not have enough time to brainstorm on Thursday they might
PATSY: // [Inaudible] having a little bit of brainstorming on Friday.
SEAN: Let these things go on Friday also.
SAMANTHA: All right. So we will just – if everything [inaudible]
PATSY: Better to have more then not enough. Exactly.
SAMANTHA: But the clips are going to be for –
SEAN: Thursday now. We are breaking –
SAMANTHA: Thursday.

While it may be coincidental that Samantha prompted both blocking episodes in this conversation, it is also possible that this is connected to her personal desire to be absolutely clear she understood plans for practice (Fieldnotes; Interviews, February, March, May). Likewise, Samantha’s role in prompting these blocking exchanges might have been linked to her responsibility for writing up the lesson plans for the week (Analytic Memo, October, 9, 2007). As was clear throughout the coplanning session, as the representative in charge of the “official” script of the lesson, she wanted to be sure that she represented the group and their plans correctly\textsuperscript{15}. She checked for group consensus numerous times throughout the coplanning session. At the end of the meeting she also opened up opportunity for garnering group corroboration of plans once a draft of the lesson plan was completed, “Now, when I write it up, is that like, the end? Is that the final thing? Are you guys going to look over and send it to me if there are changes?” (Lines 456-45). While Samantha was in charge of formally writing up the Anatomy and Physiology’s plans, the blocking sessions illustrate how she clarified group understanding within the context of the coplanning session and thus confirmed and aligned group

\textsuperscript{15} Julie also did this during the Environmental Science coplanning meeting on Feb 17\textsuperscript{th}. I wonder if this is a common role for the designated lesson plan writer across all coplanning sessions, or if this more reflects the personalities of these interns. An area for potential future research includes investigation into the role (as “group clarifier”) and also the relationship to being in charge of writing up the group’s lesson plans (formal reification of plans and an accountability factor for group work).
understanding of plans for practice. Such explanations may provide appropriate
interpretations of Samantha’s actions, however they do not necessarily explain the use of
blocking as a participation framework for all of the coteaching groups across the
semester. Rather, blocking served as a mechanism used by participants to coordinate their
actions and align interpretations for practice. Blocking in effect was a participation
framework that groups used to collectively summarize, highlight, and coordinate or
review critical ideas for practice.

While the concept of blocking is not one discussed in the literature, it is likely that
this is because classroom instruction is usually an independent endeavor. The collective
nature of coteaching practice required that coteachers coordinate understandings of their
plans. In order to operate as a unit, the coteachers needed to align their conceptions of
practice and also concepts of time and movement within the classroom space.
Participation frameworks such as blocking provided space for coteachers to coordinate
their plans and collectively clarify and review their collective understandings. This was
an important part of interpersonal meaning making as it provided the coteachers with the
conceptual alignment needed to move towards implementation in the classroom.

Conclusion

This chapter examines the interpersonal exchanges within a cohesive coteaching
micro-community as they planned instruction about the muscle. The ways that group
members worked together to develop their plans for practice are explored. It is argued
that the coteachers negotiated and renegotiated their plans for practice through a process
of envisioning their work together, considering important teacher concerns for practice and using participation structures that enabled them to anticipate how their plans would manifest in the classroom. This process was dynamic, incorporating the voices of all participants and opened up many opportunities for the participants to consider alternative approaches to their work.

Arguing for a “pedagogy of professional development” (Ball & Cohen, 1999, p. 12), Ball and Cohen call for methods that will support “teachers [to] become serious learners in and around their practice” (p. 4) accomplishing this they argue will require a shift in the field of teacher development. Their approach would make a “stance of inquiry central to the role of teacher” (p. 11) and also encourage the development of communities of practice for sustained discourse about teaching. Such changes could help to break down the isolation of practice (Jackson, 1986; Lortie, 1975), challenge conservative tendencies in teaching (Jackson, 1986; Lortie, 1975), and also serve to change the culture of the field. As they explain it,

The pedagogy of teacher education would be one in which critique would be valued and in which the learning teachers would be expected to argue with others and with themselves and to explore arguments among plausible explanations or approaches. Learning such dispositions would depend also on learning new norms of interaction. This would create disequilibrium at times, for teachers would encounter ideas and perspectives, evidence and possibilities, quite different from what they assumed. They would have to unlearn the politeness norm that
dominates most current teacher discourse. They would have to learn to be
tenacious, to probe their own and others' ideas and interpretations, to doubt and be
skeptical. And they would have to learn to combine intellectual aggressiveness
and a willingness to take risks with a humility about the incompleteness and
uncertainty of their own ideas. (Ball & Cohen, 1999, p. 27)

Teacher learning situated within critical inquiry holds the potential for ongoing fostering
teacher learning within and from practice. Ball and Cohen are not alone in arguing for
changes to the process of teacher learning. In their oft cited article about the potential of
student teaching, Feiman-Nemser and Buchmann (1985) described an idealistic view for
collective learning from practice within school settings.

If schools became places where teachers studied their own practice together and
were rewarded for doing so, future teachers would be inducted into a professional
community where collegiality and experimentation were norms. In such a setting,
observation and conversation among persons at different career stages would
expand the alternatives available to the novice... Future teachers would get the
message that learning from teaching was part of the job of teaching (p. 64).

As the analysis in this chapter illustrates, coteaching as a model for student
teaching supported the practices that these teacher educators are calling for. Teaching and
planning together broke down the isolation of teaching and promoted on-going discussion
and negotiation around practice. Through this interpersonal process teachers worked

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16 For further discussion about “inquiry as stance” see Cochran-Smith and Lytle (Cochran-Smith & Lytle,
1999, 2001)
together to develop a vision for practice. As illustrated by these data the coplanning process for sarcomere instruction was a dynamic, recursive, collective process with ongoing reflective adjustments along the way. During the coplanning meeting these coteachers shared ideas, problematized and problem-solved plans for practice, anticipated outcomes, brainstormed possibilities, clarified visions of practice, and rehearsed possible discourse for practice. As they worked together they pushed each other to examine their ideas and negotiated new approaches for practice. The coteachers drew on their developing ideas to inform their continued development of practice thus affording multiple learning opportunities for one another.

The coplanning session was not one in which one person alone directed the conversation or told others what would happen. Rather the coteachers collectively grappled with issues of teaching and learning as they deliberated the best ways to support their students learning. Together these coteachers constructed a very different culture of teaching practice than the traditional conservative and isolated norms of teacher practice (Ball & Cohen, 1999; Jackson, 1986; Lortie, 1975). Working together the Anatomy and Physiology teachers broke down isolation of teaching, took risks, and supported one another’s learning, and in doing so these teachers provided one another with rich opportunities for thinking about their practice.

Both Kellermeir (1996) and Grossman et al. (2001) draw on the notion of midwifery in their writing about learning communities and the ways that “the group assists in the birth of new ideas. For such births to occur, the group must provide a safe environment in which individuals are free to voice uncertainty, explore ideas, and state,
and retract opinions” (Grossman, Wineburg, & Woolworth, 2001, p. 984). As the Anatomy and Physiology group worked together to envision and re-envision their plans for practice they addressed concerns for practice and pushed one another to problem-solve, clarify and enact practice in anticipatory ways such as those illustrated in discussion about rehearsal and blocking practices. These interaction patterns supported the group thinking process and enabled the teachers to examine their ideas and develop new plans for practice, which were intended to better support the successful instruction of the concepts and student learning.

The ways that the Anatomy and Physiology group worked to make sense of their practice and collectively constructed their plans for practice were not unique to the Anatomy and Physiology coteaching micro-community alone. Rather, these approaches were visible across the larger coteaching community of practice. Differences between the micro-communities, however, included the extent to which these things occurred. These differences partially resulted from group dynamics including positioning (Davies & Harre, 1990) and power relations among group-members as group relations fostered a safe environment for taking risks, asking questions, and pushing one another to develop the best instructional plan. However, the nature of the discourse and the ways that group members interacted opened up opportunities for learning. As Grossman et al, 2001 explain in their work on teacher learning in community,

Politely refraining from critique and challenge, teachers have no forum for debating and improving their understandings. To the extent that teaching remains a smorgasbord of alternatives with no real sense of community, there is no basis
for comparing or choosing from among alternatives, no basis for real and helpful debate. This lack impedes the capacity to grow (Grossman et al, 2001, p. 200 citing Ball, 1994, p. 16.).

This analysis of a strong coteaching micro-community illustrates the potential of coteaching for fostering the types of teacher learning that Ball and Cohen (1999) and others have called for. The Anatomy and Physiology coteachers together incorporated an inquiry stance (Cochran-Smith & Lytle, 2001) in negotiating instructional plans that they believed would support student learning. Rogoff and colleagues (Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995) argue that interpersonal learning experiences provide a framework for individual learners to draw on in future contexts. Experiences such as those provided within the coteaching context at Biden High provided learning opportunities such as those called for by Ball and Cohen and show a possible approach for enhancing the pedagogy of the teacher education experience.

The chapter that follows further expands understanding about the coteaching experience at the interpersonal level of interaction. This next chapter also presents analysis of the Anatomy and Physiology coteachers’ experiences planning and implementing their instruction about the muscle. That chapter, however, extends the work presented here to develop insight into the role of group dynamics, and the role of the nature of collective knowing in supporting the participation and learning experiences of participants as they cotaught together.
CHAPTER 7:  
INTERPERSONAL PROCESSES FOR KNOWING AND LEARNING WITHIN THE ANATOMY AND PHYSIOLOGY MICRO-COMMUNITY

Communities are microcosms of larger social collectives in that they pivot on the tension between the rights and the responsibilities of membership. For a community to be sustained, members must believe in their right to express themselves honestly without fear of censure or ridicule. But genuine communities also make demands on their members—membership comes tied to responsibilities. In a professional community of teachers, a core responsibility is to the learning of other teachers. (Grossman, Wineburg, & Woolworth, 2001, pp. 979-980)

This quote by Grossman, Wineburg and Woolworth emphasizes two aspects of community relations as central to participant learning: the creation of an environment that welcomes open honest conversation and also a commitment to the learning of other participants. Continued in this chapter is discussion of interpersonal learning experiences within the coteaching cohort community of practice that was begun in Chapter 6. Discussion centers on the Anatomy and Physiology coteachers’ experiences planning and implementation of instruction about the sarcomere as represented in the sarcomere slice of life data set. Specifically, this chapter examines the Anatomy and Physiology group’s process of participation and development through two themes that emerged from the data: group dynamics and collective knowing. As will be argued, the Anatomy and Physiology group’s dynamics and group interactions enabled members to work together in productive ways, afforded access to learning opportunities, and supported participants’
on-going development of practice and participation in the community. Cumulatively, these experiences provided participants with on-going access to the cultural practices of the community and enabled them to together extend and learn the practices within the context of their collective work. These findings are valuable because they illuminate ways that cohesive coteaching communities support the learning and participation of participants and extend research about the process of learning to teach within coteaching field experiences.

This chapter begins with discussion of group dynamics and examines issues of participation through analysis of positioning (Davis & Harre, 1990). Next, risk-taking as part of the nature of the coteachers’ interactions is examined. It is argued that the nature of these group dynamics opened up learning opportunities for all participants. Discussion then shifts to the process of collective knowing. The collective knowing section argues that through the process of sharing ideas and cultural knowledge, the cumulative knowledge of the group members serves to support the collective practice of all participants. Together, the group has access to a greater body of knowledge than does any single individual.

**Group dynamics**

The dynamics of the Anatomy and Physiology micro-community helped to create a supportive environment in which participants felt comfortable asking questions, taking chances, and challenging one another’s ideas. As a unit, this group was fairly cohesive and bonded (Siskin, 1994). This micro-community supported one another’s practice and
worked together to co-construct their practice and in the process examined issues of teaching and learning. Throughout this conversation, group members critiqued their plans and pushed one another to develop alternatives that would better support instruction. Overall, this was a context where group members felt valued and were comfortable sharing their ideas (Samantha and Sean Interviews). As discussed in the sections that follow, the Anatomy and Physiology group’s dynamics created an environment that afforded opportunities for engaging in rich discourse about practice and collectively participating in the work of coteaching. The two aspects of the Anatomy and Physiology group’s dynamics discussed below include how the coteachers positioned themselves and each another as important group members and how they incorporated risk-taking as part of their regular practice.

**Positioning coteachers as contributors and valued colleagues**

*Positioning* is a mutually interactive process comprised of the discursive practices that participants use in conjunction with how individuals conceptualize themselves and each other in a context (Davies & Harre, 1990). Positioning is a dynamic process; within the context of any discourse, participants work to position themselves and each other. As Davis and Harre describe,

> With positioning, the focus is on the way in which the discursive practices constitute the speakers and hearers in certain ways and yet at the same time is a resource through which speakers and hearers can negotiate new
positions…position is what is created in and through talk as the speakers and hearers take themselves up as persons. (p. 62)

Participant positioning is important to understand within learning communities. The ways that participants view themselves and each other shapes interactions and the resultant opportunities for learning (Davies & Harre, 1990).

In this section I argue that the coteachers’ identities as colleagues were jointly constructed and maintained by all participants. It is argued here that group interactions were mutually respectful and tended to value the collective contributions of everyone regardless of prior teaching experience. It is also argued that positioning coteachers as important contributing group members and valued colleagues opened up access for all to participate in the Anatomy and Physiology micro-community, enabling them to collaborate and critique ideas as they negotiated plans for instruction. These interactions reflect the participants’ roles and identities as group members and valued collaborators in the coteaching process. Such interactions also reflect underlying assumptions of coteaching and cogenerative dialogues which support the collective recognition and valuing of coteacher contributions in their mutual work (Scantlebury, Gallo-Fox, & Wassell, 2008).

As was described in Chapter 6, the development of lesson plans was a mutual, respectful negotiation of ideas in which each participant filled important roles in examining and shaping the group’s ideas. There was a clear respect of voices and perspectives and each participant took turns critiquing plans for practice and challenging others to think more deeply. One example of this respect is how these coteachers
discussed their collective practice. Whenever the coteachers referred to what they would
do in the classroom with students, they referred to the coteachers as a collective.
Discussion of teacher action was consistently referred to as what “we” would do. (i.e.
PATSY: We said we were going to use this as well, and then we will have them actually
go through the parts – (Lines 7-8); SAMANTHA: We could put it down as optional. (Line
15); SEAN: Do you think we do that Wednesday, or do you think we do that Thursday?
(Line 17)) During the 20 minute duration of the sarcomere coplanning conversation, the
term “we” was used over 150 times by all of the teachers. The groups’ inclusive use of
the pronoun we reflected their mutual process and the ways that they worked together to
support their practice within this setting. For these teachers coteaching and coplanning
was a joint enterprise.

The ways that interns approached the group and interacted within these contexts
was also critical in shaping how they were perceived and treated by others. The fieldnote
below summarizes an excerpt from a conversation I had with Patsy early in the morning
when the interns were attending a professional development technology training session
that the school was holding.

*Patsy mentioned that Samantha was sick, but in anyway. She had been to the
infirmary at 3:00 AM the night before…. she was informed that they could give
her a shot to make her stop throwing up, but that she would have to remain at the
infirmary. Samantha had said that there was no way she was going to stay at the
infirmary because she needed to be at school. Patsy was concerned that
Samantha was sick and felt compelled to come into work anyway. She said that
she was going to talk to her about the fact that it was okay to take sick days – that
that was allowed and expected. (Field notes, Feb. 17, 2005).*

Patsy’s concerns about Samantha were apparent and understandable; however,
Samantha’s stance about needing to be at school was connected to her determination to
be viewed as a committed and valued member of the team (Fieldnotes, Samantha Interviews, February and March). Claire Lyons, the program administrator had talked to the teaching interns about theories of social capital during the science methods course and had emphasized the importance of the initial weeks of coteaching as a time to establish oneself as a committed member of the community. Samantha believed that she needed to be at school in order to participate in the coplanning session and to meet her responsibilities as a member of the coteaching group (Field notes, Samantha, Interview, February). This is one example of how the interns established themselves as team members. Another example was through the contribution of new ideas to group practice.

The teachers could have begun the muscle unit the same way that Patsy had done in previous years. However, Sean had located and shared an alternative idea: the sarcomere model-building activity. That Sean felt comfortable to propose an alternative approach was reflective of both how he viewed himself within the group and also the group’s willingness to listen to him and invest time in the development of this idea. Likewise, Sean’s actions opened up opportunities for him and his coteachers to think about new curricular approaches for helping students understand the ways that muscles work. The intern’s actions are illustrative of the ways that the interns perceived themselves as coteachers and showed their commitment to group responsibilities. Furthermore, each of the examples discussed in this section illustrate ways that members’ actions supported participation in the group process and enabled learning opportunities to unfold.
Examination of the coplanning transcript provides further insight into the positioning of participants within this strong learning community. These data illustrate how Patsy’s conversational practices showed that she valued the intern’s contributions in the coplanning process. This specific example occurred when Samantha and Sean expressed initial concerns about perceived difficulties connected to the model building activity. Patsy responded to the group by further soliciting possible options from the interns while simultaneously suggesting her own. For example,

SEAN: // Do you think the students will be able to [build a model]– I would not know how to make the two circles [with the pipe cleaners]. You know what I mean?
PATSY: I don’t know. What do you think? Can we give them some directions? Should we give them the idea?

In this exchange, Patsy’s response indicates a sense of equality between herself and the interns. Her comments show that she did not have a simple response to their concerns and that everyone’s opinions were important to the decision-making process. Her conversational moves open up the floor to the thoughts and ideas of the all the group members and indicates a valuing of the intern’s ideas as providing potential solutions to the issues of practice. Patsy’s comments were indicative of this group’s dynamics and the overall tone of their discussions. By using the term “we” Patsy, showed a valuing of everyone’s contributions. This type of remark was not an isolated occurrence: a number of times when poised with a question or challenge she “deflected” it and instead opened it up to group consideration. Her comments illustrate a valuing of Samantha and Sean’s input and ideas and collective sharing of responsibility for determining the best approach for practice.
The positioning within the micro-community and the construction of all group members as valued coteaching participants challenges traditional roles between student teachers and cooperating teachers where student teachers seek to learn the expert’s practices. These findings appear to counter Smith’s (2005) recent study of co-planning, which was situated within a more traditional model than that examined here. In her study of co-planning sessions between student teachers and cooperating teachers, Smith (2005) found that interns’ voices were often silenced when cooperating teachers and interns coplanned together. Smith argued that power differentials between the participants in her study inhibited the intern’s ability to voice her opinions and try out ideas within the public forum. She suggested that situations where these stakeholders are more equally positioned might provide richer learning opportunities for student teachers. She concluded,

This study illustrates the need for a framework to supplement the learning through participation model—one that calls for novices and experts to engage in a discourse that explores tentative ideas, investigates theory, and embraces differences in their ideas. This discourse would include a questioning of existing practices and ways of participating in this practice. (pp. 68-69)

The coteaching model and specifically the examples presented in this discussion of the Anatomy and Physiology coteachers’ experiences provide a strong counter example to Smith’s findings. The coteachers’ group interactions helped to shape the ways participants interacted and opened up opportunities for all participants to suggest, explore, critique and engage in new ideas about teaching. As a collective the Anatomy
and Physiology coteachers each made valuable contributions in shaping their collective practice and in learning from one another. These interactions also reflect the professional identities that participants were developing as colleagues and coteachers.

Risk-taking

In the previous chapter, findings illustrated the ways that the Anatomy and Physiology coteachers worked together to examine and problematize their ideas for practice, through processes of problem solving, clarification and envisioning their practice. An additional way that the coteachers collectively supported the learning opportunities of group members was through the ways that they engaged in risk-taking as a regular part of their practice. In this section I discuss the nature of risk-taking within the coteaching community of practice. I argue that the public nature of coteaching opened up two different types of risk-taking for the coteachers. One type of risk-taking related to the ways that the public nature of coteaching practice created a sense of exposure and vulnerability for the teachers. The second type of risk-taking connected to coteachers’ expanded pedagogical practices that occurred within the coteaching experience. Interns and cooperating teachers perceived each of these risks differently. These risk-taking efforts reflected the commitment of group members in supporting one another’s practice and also their sense of responsibilization (Hunt, 2003) towards student learning in their classrooms. It is argued that these practices became part of the cultural practices of the group and that they supported the coteachers’ opportunities for learning within the context of practice. I briefly draw on the research literature to define risk as experienced
by the coteachers. Then I illustrate the coteachers’ risk-taking practices with examples from the sarcomere slice of life data set.

Multiple types of risks such as the potential for loss, the significance of loss, and uncertainty of decision outcomes have been identified in the research literature (Yates & Stone, 1992). This discussion of risk, however, is situated within research related to the risk of common everyday life (Hunt, 2003; S. J. Smith, 1998). Hunt depicts risk-taking in everyday life as linked to the anxiety resulting from problematization of life circumstances and the discourse of risk surrounding response to a situation. Smith (1998) contrasts risks embedded in everyday life to those which he describes as thrill-seeking and describes the implications of everyday risk-taking in terms of the personal, intellectual, social, moral and ethical. Others have connected such risks to learning processes and identity development. Taking everyday risks is not viewed as negative (Hunt, 2003; S.J. Smith, 1998), but rather linked to a sense of vulnerability emanating from the uncertainties of life and on-going decision-making. Like all other types of risks, these risks involve uncertainty, vulnerability, emotion, and trust. Additionally, a sense of morality and ethics towards others are implicated. Smith, whose work relates to pedagogy and adult responsibility towards children in their care, developed the term “pedagogy of risk.” He argues that when adults assume responsibility for children’s growth and learning, an “ethic of risk” is implicated and “there is an obligation placed upon [adults] to consider risk in light of the child’s growth” (p. 15). The term responsibilization is used in the literature to describe risk-taking that entails an embedded sense of responsibility towards others (Hunt, 2003).
Research findings in fields of psychology, political science, sociology and anthropology have acknowledged that risk is subjective and that different groups of people (e.g. experts vs. laypeople, men vs. women) perceive societal risks differently (Douglas & Wildavsky, 1982; Slovic, 2000). In the education research literature, both Freedman (2001) and Ridenour and Twale (2005) have noted that different generations of educators experience risk-taking differently. In her work with teacher research groups Freedman (2001) has noted differences between how new and experienced teachers talk about and experience risk in their practice. Data discussed below supports these findings.

Exposure and vulnerability, or a welcome respite?

The beginning of coteaching was a time of anxiety and uncertainty for the interns. Many of them indicated early in the semester that they were anxious as they began their full practicum, unsure of what to expect, and nervous about coteaching as they had only experienced it in their science methods course. As Sean explained in a phone interview on March 20, “I think it’s going pretty well. I mean, I enjoy the teaching and I wasn’t sure at first that I would. I mean, I never had any really experience teaching.” He reiterated these ideas in his May interview, “At first when I came in, I didn’t know if I would really be able to do it... I was worried...” (Sean Interview, May).

During the early weeks of coteaching, everything about the teaching experience was new and incorporated some level of risk and uncertainty around practice. Interns taught four-fifths of their classes alongside coteachers, meaning that their actions were visible to peers and colleagues throughout the day. It was in these public spaces of
practice that risk-taking occurred and participants reported feelings of vulnerability and anxiety as they exposed their developing practices to other adults. Early in the semester interns described the experience of learning to teach in a public arena as creating a sense of vulnerability and exposure at a time when they were taking many new risks and challenging themselves in new ways. During the initial weeks of coteaching, many of the interns reported that the public nature of coteaching led to an underlying sense of anxiety and uncertainty as they exposed their vulnerabilities as learners and new teachers to their colleagues. Samantha was exceedingly anxious about teaching. She was overwhelmed by the complexity of practice and she also struggled to teach with coteachers with different philosophical orientations. Patsy, the cooperating teacher, supported Samantha’s developing practice and helped ease her anxieties. The first day of the muscle unit it became clear to me how anxious Samantha was about teaching in the classroom — particularly about teaching alone and about being observed by her supervisor. She articulated her anxiety a few times during the day. One of these occasions occurred as she was prepping for her period 5 solo,

*Samantha:* “I get so nervous.”
*Jennifer:* "I know, but it will get easier.
*Samantha:* “I know it will. I just can't wait for that day to happen.”
(Field notes, Anatomy and Physiology, Samantha just prior to period 5)

Samantha’s elevated anxiety levels were also clear earlier during the day during lunch. The Anatomy and Physiology coteachers were eating in their classroom and talking about how Mr. Baker, the Biology intern’s clinical supervisor, was in the building. Samantha was certain that he was going to observe her during her period 5 Solo class. Patsy worked
to ease Samantha’s concerns and help her be more comfortable should Mr. Baker attend
class. As I wrote in my field notes,

Patsy, Sean and Samantha were all eating lunch and talking. Samantha was in a
bit of a tizzy. “Baker”[clinical supervisor] was in and she had a feeling he was
going to be coming [to observe] her solo. Patsy asked me if it was okay for her to be was involved in Samantha's lesson at this point in the year. She wanted to
know when cooperating teachers were expected to totally let go in terms of the solo. She said that during seminar she had the feeling that the interns were all in
different places and that at this point Samantha was still more comfortable with
Patsy being involved in the class, even though all she did yesterday was take attendance. Patsy felt it wasn't that Samantha needed her to be very involved, but
that it helped her in terms of feeling comfortable. (022405 Field notes, period 4A,
Lunch, Patsy, Samantha and Sean)

Although Patsy felt that she only needed to be involved in the class in peripheral
ways, she believed that by being involved in Samantha’s class she would help to ease
Samantha’s anxiety about being observed and teaching alone. Patsy believed that
minimal involvement, such as taking attendance, facilitated Samantha’s practice in the
classroom and helped her be more comfortable. Though Patsy viewed her contributions
to Samantha’s solo class as minimal, both coteachers believed that Patsy’s contributions
greatly helped Samantha assume a central role in the instruction and helped quell her anxiety. By contributing to Samantha’s class in this way, Patsy provided emotional
support for Samantha, helping her assume her new role as teacher. Additionally, she
supported Samantha as she took risks in the classroom and dealt with her first classroom observation.

Freedman (2001) reflects on twenty years of experience working with teacher
research network groups. She notes differences between the ways that first-year teachers
and more experienced classroom teachers talked about taking risks in the teacher research
groups. She writes, “For the more experienced teachers… support in the group setting fed into risk-taking in the classroom. For the new teachers, it made the whole act of teaching, which was generally a risky business, more manageable” (Freedman, 2001, p. 198).

There are clear parallels that can be drawn between Freedman’s findings and the ways that these participants talked about the risk inherent in their practices. For the interns, everything about the teaching experience was new and incorporated some level of risk. For the interns, the public nature of coteaching was an ongoing risk. In contrast to the interns, Patsy did not describe the public nature of coteaching practice as opening up a sense of vulnerability. She described the experience as an opportunity to gain insight into practice and open a new perspective into her work. She explained, “Once you are in your classroom, you don’t see anybody else teaching. These guys come in here and make me reflect on how I was in student teaching, how I am now, and how there are still some things that I need to change” (Patsy, Interview, March).

In summary, the process of coteaching was very open and visible as the coteachers collectively practiced. The public nature of coteaching appears to have created a sense of risk-taking for interns that resulted from an increased sense of vulnerability as they learned and practiced within a public arena particularly in the early part of the semester. This was particularly true for the interns as teaching was new and they were continually trying new things in front of other teachers. Taking chances within this public arena required a large degree of trust in fellow coteachers, but the general tenor of the group reflected a community culture of support and encouragement. In contrast, Patsy saw the public forum as opening up opportunities for self-reflection and learning. The
second type of everyday risk-taking described by coteachers was pedagogical risk-taking. Interestingly enough, across the larger coteaching community of practice, cooperating teachers expressed a greater sense of risk around pedagogical risk-taking than interns who had learned about inquiry-oriented instruction in their science methods courses and believed that this was the best way to support student learning (Fieldnotes, Interviews).

*Pedagogical risk-taking*

Teacher practice typically tends to be conservative, drawing on activities and pedagogies that are tested and safe (Ball & Cohen, 1999; Jackson, 1986; Little, 1999; Lortie, 1975; Ridenour & Twale, 2005). As Hertzog (1998) writes, “teachers take risks with all instructional activities by not knowing ahead of time how well the students will perform or respond to the activity” (p. 29). In the sarcomere coplanning meeting, the risk inherent in the new model-building activity was discussed numerous times. Interns typically didn’t use the word “risk,” but framed risk—as Samantha did—by calling something potentially “difficult,” (Line 63). Sean and Samantha’s comments tended to center around questions, concerns for practice, and attempts to clarify ambiguity. While the interns did not actually use the term ‘risk,’ this was unnecessary as the “discourse of risk” typically references the associated concerns, anxieties, and sense of vulnerability that emanates from perceived risk and insecurity (Hunt, 2003). However, the notion of “risky” practice did not predominate their comments; for them, all practice was new and uncertain. In contrast, Patsy, the cooperating teacher, specifically described the model-building activity as “risky.”
One discussion of risk was prompted by Samantha’s continued concerns about one of their plans for practice: “It is difficult going that route, though” (Line 63). Acknowledging Samantha’s concerns, Patsy stated, “That is the risky route to take. I mean, that is kind-of inquiry” (Line 66). Sean then remarked that he felt that students would enjoy the experience, “I think the students like having to build and make [their] own plan even if they are wrong and they have no idea what they are doing” (Lines 68-69). By drawing on concepts of student motivation and engagement, Sean touched on one of the six teacher concerns that Kennedy (2006) argues teachers consider as part of their decision making process and suggested that the activity actually might diminish some of the risk inherent in their proposed plans. He then further posed that the teachers could support the students’ engagement in the activity by “lead[ing] them how to build it [the model], right?” (Line 71). By being able to direct students to correct plans after the students had time to explore, Sean’s suggestions provided further means for diminishing some of the risk inherent in the open-ended nature of the activity. Patsy also, offered an additional approach for diminishing risk by arguing that students could test the activity during period 1. If things did not work out, a more directed approach “Plan B,” (Lines 76-77, 79-80) could be implemented for the rest of the day. As a group these coteachers worked together to diminish risk by developing strategies that they could utilize in the classroom.

The sarcomere activity challenged Patsy to expand her teaching repertoire. Numerous times throughout the planning and implementation of the sarcomere lessons she mentioned “risk” embedded in the model-building activity. On a number of occasions
both before doing the activity and in class with the students she expressed her concerns about how the activity would work. Patsy had not often used such activities in her practice, and she expressed concern that the activity might be overly challenging for students. To reinforce just how risky this was for her during the coplanning meeting she stated, *And it will be—I mean—I have not done a lot of things where these guys, really—I mean, like, that type of thing. This will be unique. They are kind of figuring to do something different* (*Lines 149 – 151*). This is just one example of the numerous times that Patsy identified the activity as one that entailed taking risks in practice. However, her willingness to try new pedagogical approaches reflected the support and openness towards risk-taking fostered with the Anatomy and Physiology micro-community. Furthermore her willingness to consider these practices and participate in these experiences helped open-up learning opportunities for the collective. As Smith (2005) writes about traditional models of student teaching,

> The potential for student teachers to introduce new ideas and ways of talking to the teaching and planning discourse is tempered by the hierarchical and high-stakes nature of the cooperating teacher-student teacher relationship. The cooperating teacher “… serves as a ‘gate-keeper’” (Hoover & Frieman, 2002, p. 1)... Power differences among cooperating and student teachers manifest themselves “in patterns of communication that can constrain or support risk-taking” (Graham, 1999, pp. 524, 538). (Smith, 2005, p. 54)

The model building activity involved risk taking for all members of the group. Yet, the success of the activity served as a source of enthusiasm about their achievements
and their potential as a group (Fieldnotes; Interviews). As documented in my field notes on February 24th, all the teachers were very enthusiastic about the success of the model activity and the students’ response to the project. Furthermore the success of the modeling activity and the success of the groups’ collective process provided further enthusiasm and encouragement to work together on new challenges (Fieldnotes; Interviews).

The coteachers’ practice within the Anatomy and Physiology micro-community was mutually supported as colleagues supported each other’s efforts and also worked towards a goal of student learning. This sense of mutuality helped to diminish the risk of failure in the classroom and also diminished personal vulnerability around failure. Additionally, it fostered coteachers’ ability to take on new challenges. The public nature of coteaching practice opened up situations for risk-taking while creating an environment of support and experimentation within the coteaching community. Across both types of risks, the culture of the community was one of support and encouragement that enabled participants to take on new challenges. In the section that follows I continue to develop understanding about how the Anatomy and Physiology’s interpersonal interactions supported the collective learning experiences of all group members. In that section I examine the concept of “collective knowing” and explain how as a unit the coteachers had a greater insight into practice than any of the coteachers did individually.
Collective knowing in practice

One of the first lessons to be learned in the development of teacher community is that some people know things that others do not know and that the collective's knowledge exceeds that of any individual. (Grossman, Wineburg, & Woolworth, 2001, p. 973)

As Grossman, Wilson, and Woolworth in their analysis of the experiences of a teacher learning community point out, within a group each individual has information to contribute. Furthermore, they highlight that the group’s shared knowledge is broader than that of individual participants. This understanding around the cumulative power of a group has been described elsewhere as distribution of knowledge and distributed memory (Hutchins, 1995) or knowing in practice (Orlikowski, 2002). These understandings are present in the literature on business and organizations and are understood to result from socially situated activity; however, they do not appear to be as prevalent in the teacher education literature where knowledge is more commonly framed through a psychological framework and teacher knowledge is typically understood as information to be internalized, and references to formal knowledge, or theory, and typologies of knowledge are more likely to be the dominant frame. In contrast to the dominant perspective regarding knowledge in teacher education, in views of collective knowledge, “The socially situated activity of learning and doing in an organization creates a body of knowledge and capabilities which are collective properties, differing from and in addition to those contained or owned by any individual member” (Merali, 2000).”
Understanding the power of “the collective” in creating a shared body of information provides a way for developing insight into the interpersonal learning processes afforded within coteaching groups. In this section it is argued that as coteachers shared ideas, perceptions, perspectives, and information they created a cumulative body of information that all participants could draw on in their practice. As I looked across the information and ideas the coteachers shared within sarcomere slice of life data set, it was clear that as participants shared ideas and negotiated plans for practice they were contributing to the collective understandings of the group and shaping their collective practice. Central to the discussion of this section is how newcomers access knowledge of the community and how both new and experienced group members all contribute to the on-going collective understanding of the group thus affording opportunities for learning for everyone involved.

Within frameworks of situated learning the central focus is not necessarily formal knowledge acquisition, but rather the appropriation of the cultural practices by individual learners. As peripheral members of the community of practice, the interns gained on-going access to culture of teaching, cultural practices, cultural Discourses, and cultural “know-how” of the community. These collective understandings were then available to support the intern’s participation and development as professional members of the community. The discussion that follows illustrates how the coteachers’ collaborative work afforded the participants new opportunities for knowing about practice. The focus of this section is not about types of knowledge shared, but rather focuses on the information and understandings about practice shared across the sarcomere slice of life.
experience. The purpose of this section is not to delineate every bit of information shared or mentioned throughout the Anatomy and Physiology slice of life data set. Its purpose is to illuminate some of the ways that these coteachers shared their insights into practice with others, thus creating shared understanding for the group to utilize as they worked together.

Through ongoing interactions with the established members of the Biden High School science department, interns began to access the practices and culture of their new community during the initial weeks of the coteaching experience. I observed four coplanning meetings on February 17th, the same day that the Anatomy and Physiology sarcomere coplanning meet occurred. A commonality across the meetings was that this was a time for cooperating teachers to share practices and structures of the classroom. As they did this they shared their individual classroom practices and policies and cultural understandings of the department, disciplines and the larger teaching communities in which the coteachers worked.

Analysis of the sarcomere slice of life data set revealed a number of ways that the Anatomy and Physiology micro-community constructed their collective understanding of practice, thus informing one another’s classroom actions. In the section that follows I discuss two ways that this occurred. First, during the coplanning meeting, Patsy shared insights about the uncertainty of practice. Her sharing provided interns with access to the local knowledge of the practice and the ways that she and other teachers in the Biden High community dealt with problems of uncertainty in their regular practice. A second example illustrates ways that the interns’ helped to support Patsy’s practice — when she
expressed concerns about her ability to integrate a new form of technology into her solo class.

Uncertainty in practice

Teaching has been acknowledged in the literature as a uncertain and complex process (Cochran-Smith, 2001b; Dudley-Marling, 1997; Floden & Clark, 1988; Jackson, 1986; Labaree, 2001; Lortie, 1975). However, in contrast to these understandings, years of K-12 classroom observation frequently leads preservice teachers to assume that teaching is both “simple” and “natural” (Labaree, 2001; Lortie, 1975). Britzman (1991) has also noted that cultural myths about teaching depict teachers as assured knowers and experts. These images of teachers conflict with the uncertainty and complexities of practice. Preservice teachers in Britzman’s study of learning to teach struggled with tension created between the uncertainty of practice they experienced in their field practicum settings and perceptions of teachers as experts who are “in control.” For the teachers in her study the contradictions between the certainty of ideal images of practice and the uncertainties found in the reality of practice proved to be a significant hindrance to the student teachers’ development. These contradictions led to an internalized sense of lack of control and personal failure (Florio-Ruane & Smith, 2004), and both of the student teachers ended up leaving the field of teaching.

In marked contrast to Britzman’s findings, the cooperating teachers at Biden High school acknowledged the uncertainties of practice in their ongoing conversations with the interns. Through regular exchanges the interns gained access to the collective knowledge
of the community and came to accommodate the on-going uncertainty embedded within the teaching experience. For example, during the course of the sarcomere coplanning meeting, Patsy pointed out several different types of uncertainty that could impact the instruction on the muscle unit. These dilemmas included uncertainty related to: not knowing how the activity would work; timing and pacing of instruction; uncertainty based on factors outside of one’s control such as school administrator and state testing policies altering normal changing teaching schedules; and student response to instruction. Discussion about uncertainty as a regular part of practice was accompanied by suggestions from Patsy about how to manage these issues as they arose in practice. Kennedy (2006) asserts that part of learning to teach requires that teachers learn to develop “sustainable teaching practices” to help them “gain control of their work” (p. 206). She describes these as “a repertoire of strategies and rules of thumb for responding to unanticipated events” (p. 210). These routinized practices help classroom teachers manage the complexities of their classroom. In this section I argue that during the Anatomy and Physiology’s sarcomere coplanning meeting Patsy not only acknowledged the uncertainties of classroom practice, but she also provided insight into how to deal with these uncertainties as they arose in the classroom. This local knowledge of the classroom supported the group’s collective knowledge and practice. Additionally, Patsy’s insight helped to challenge myths of classroom practice as simple and natural, therefore opening up opportunities for teachers to discuss and explore the complexities of practice. The discussion that follows illustrates how Patsy contributed to the collective knowledge and practice of the group around issues of classroom uncertainty.
Throughout the coplanning meeting Patsy acknowledged uncertainty as part of practice, cautioning Samantha and Sean about potential surprises that might arise during instruction, while also sharing how she dealt with uncertainty in her practice. Patsy did not make declarative statements about practice being uncertain, yet throughout the coplanning meeting she mentioned that the teachers might not know how something would work out until they actually tried something out or experienced it in practice. Her comments reflected a need to be flexible in practice and responsive to classroom situations as they occurred and insight into the culture of practice and teaching experience at Biden High. As she explained during the meeting, it is hard to anticipate what will happen in practice and, therefore, teachers must learn to recognize how to work with this uncertainty. Floden and Clark (1988) write that acknowledging and talking about the uncertainties of practice is an important part of helping preservice teachers realize that “uncertainty is an essential, important part of teaching, not merely a worry and trouble” (p. 519). Additionally, they write that, “if teachers can articulate uncertainty in conversations among themselves, they may also be able to communicate it to others, thus reducing the outside pressure for certainty” (p. 519). In talking about the uncertain nature of practice, Patsy opened up an arena for discussing the uncertainties of practice while also providing interns with important insight into the complexities of teaching. Furthermore, she helped the interns avoid the dilemma faced by the preservice teachers in Britzman’s (1991) study who internalized uncertainties in their practice as personal reflections of their shortcomings as classroom teachers.
Patsy alluded that one way to deal with uncertainty of practice was by being prepared and by trying things out themselves so as to avoid potential issues. Despite the fact that Sean had found complete directions and resources from the internet for a sarcomere model building activity, Patsy twice commented about the need to try out the activity in order to gain a better understanding of how it would work and exactly what types of materials would be needed. While Patsy did not strongly emphasize this issue, the importance of her point was reemphasized the day before the teachers were to implement the modeling activity with their classes. When the coteachers finally assembled their supplies, they realized that they could not build a three-dimensional functioning model as they had hoped. At that point the teachers changed their plans for practice once again. I wrote in my fieldnotes,

*The coteachers attempted to [build a 3D sarcomere model] yesterday and they could not get it to work. When they found they were getting pretty frustrated they adjusted the assignment to making a 2D model and creating a 3D model that moves for extra credit…. They are also intending on giving kids partial credit for attempting to make a model that moves. (Field notes, Lunch, Patsy, Samantha and Sean, February 24, 2005)*

This was not the only time in the semester when things did not work or when teachers found that activities needed to be adapted for the classroom. The need to test out the activities and labs was an idea that all of the seasoned teachers tried to reinforce throughout the semester (Fieldnotes; Cooperating teacher and intern interviews). Throughout the semester, across all micro-communities, plans were often altered based on the results of what happened when activities were pre-tested by the coteachers, or when activities were utilized with one class and coteachers decided to alter plans for the later classes that followed. The need to try things out, to anticipate problems, and then to
adjust plans around concerns was a cultural Discourse of the community and an embedded understanding about what it meant to teach in this context. Four additional points about the uncertainty of practice are presented in the examples that follow.

Another indicator of the uncertainty of practice evident in the February 17th Anatomy and Physiology coplanning meeting was connected to classroom time and uncertainty about exactly how long various aspects of instruction would take. A number of times Patsy pointed out the importance of being prepared should the teachers find themselves at the end of a class period with extra time. Stressing the importance of having “back-ups,” Patsy provided possible approaches for addressing these possible issues. Her comments were pragmatic. For example, at one point as the coteachers plotted out the timing of their plans, she remarked, ‘I don’t know that we will get into that or not…. that is our backup plan for Wednesday” (Lines 317, 319-320). Another time she explained the importance of being prepared to draw on the lesson plans for the next day, should they have extra time at the end of class and need to do so. Patsy’s comments are strategies that she shared with the interns about how to manage classroom time and deal with instances where they might have too much or not enough material planned for one class period. Additionally, these are examples of what Kennedy (2006) identifies as “sustainable practices, practices that are automated enough that they can be sustained without excessive cognitive or emotional burden” (p. 206). Kennedy argues that all teachers must develop and learn sustainable practices to help support their teaching and deal with the complexity of practice. Additionally, she notes that these needs are often not addressed in University-based teacher education courses.
Across the coplanning session Patsy, Samantha, and Sean all tried to anticipate student response to the lesson as they shaped their plans for practice. When Sean asked, “Do you think the students will be able to [do this]—I would not know how to make the two circles. You know what I mean?” (Lines 41-42). Patsy responded by offering the following insights about the students based on her classroom experience. The funny thing is that [when there are] things that I think the kids are not going to have any clue what to do with, or if I would have been clueless, those are the things they tend to really excel at. (Lines 50 – 52). Patsy again later remarked that the teachers should not underestimate the students and reminded the interns that students might surprise them saying, There are some kids who will take this, and they will come up with things that we had not even thought of that will be better than what you thought …I mean, that is the hope. Because there are times when they will surprise you and they'll come up with things and it's like, "Wow, I didn't think to do that."… Kids really can come up with things that you did not think of. (Lines 132-133, 135-136)

At some level Patsy’s comments are reassuring suggesting that despite not being sure of the outcomes of the activity, there is a good chance that the students will develop good ideas. While conveying a sense that the students would be able to do the activity, Patsy also directly acknowledged the unpredictability of work with students and the inability to always predict how an activity might turn out.

Near the end of the sarcomere coplanning meeting, the issue of uncertainty arose one more time. This time it was around how to define lesson success and failure. Patsy commented, I am hoping maybe we will get some good models, and if it does not work, then you learn from it. A lot of times with a first model, trust me, it is not that it completely failed, it is just that they need to tweak something, and you will do that
through the day, and then we will make this for next year and say okay next time let us try it this way and see what happens. (Lines 448-453)

In this comment Patsy addressed both the uncertainty of practice and how one defines a successful lesson. At some level she was preparing the group for the possibility that the activity may not work as anticipated. However, she argued even if the activity did not go as well as they hoped it would not necessarily be a failure. Rather, she focused on the importance of the teaching experience as one of learning about practice, arguing that success or failure in practice is better defined as a learning experience and ongoing opportunities for improving practice for the future. Even if the activity did not work, it would provide a learning experience for the teachers and be something on which the coteachers could improve for later in the day and for future years. Her comments showed personal beliefs about the role of reflective practice and the on-going need to adjust and improve upon practice. Additionally, it presented a view of teachers as on-going learners about their practice through their practice. These views also reflected the larger Discourse of the coteaching community of practice and the coteachers’ stand about the importance of reflective practice as a part of their ongoing work (Fieldnotes).

Patsy’s willingness to discuss and share her insight into the uncertainties of practice opened up opportunities for the interns to understand their classroom practice as a reflection of the complexities of practice rather than to frame their work as a known and certain construct. These insights reflected the ambiguity of classroom practice and the need to adjust to what occurred within the classroom context. The process of collective knowing was not uni-directional with only Patsy providing interns with information about practice. The interns also supported Patsy’s practice, participation, and insight into
new ways to work within the classroom. These findings contradict typical views about student teacher-cooperating teacher relationships that position student teachers as novices who are working in the placements in order to learn from expert teachers. Discussion of one example from the sarcomere slice of life data set where this occurred follows.

*Samantha and Sean supporting Patsy’s use of technology*

On March 3, near the end of the muscle unit, the teachers conducted a review of the unit material for the final exam with the students by playing a version of the game *Jeopardy*. During the review the teachers explicitly incorporated ideas, practices, and material from their sarcomere lessons as they led the review in the way that they delivered instruction and in regard to the specific questions that they asked. I begin with an excerpt from my fieldnotes, and then I discuss the example.

_Patsy seemed excited about the Jeopardy [review] game, as were both Sean and Samantha. Sean had made up the game and the questions and set it up on the computer. They felt that period one had gone better when they had all four of the teachers in the room. One person, I think, was running the computer, another asking the questions, another doing the scorekeeping. Samantha seemed more comfortable with how it went period 1, but what I observed during period 3 was flowing fluidly between the two teachers and the students. Patsy said to the interns, “You know, I am a little concerned about how I am going to do this period 6 by myself.” They started kind-of brainstorming a little bit about how she could do the review without the other coteachers. Patsy acknowledged that she had a student aide during that class period, but she said she did not feel comfortable putting her at the board keeping score and doing the math. Samantha and Sean suggested she integrate the aide into the lesson by having her run the Power Point on the computer. That way, they explained, Patsy could focus on asking questions and doing the scorekeeping._ (Fieldnotes - Beginning of lunch, period 4A: Patsy, Samantha, and Sean, March 3, 2005)

This data provides another example of the dialectical nature of coteaching practice and the ways that coteachers contribute to one another’s practice by helping them extend their
current practices. In this example, Samantha and Sean contributed to Patsy’s practice in two ways. First of all, they had developed a new version of a Jeopardy review game that enabled students to participate in groups – something that Patsy had explained during their coplanning meeting on February 17 was essential to any good class review and game. Secondly, the interns helped Patsy to re-imagine her practice suggesting ways to transition from coteaching classrooms with several adults by envisioning new ways to utilize her student aide in classroom instruction. Through the ideas that they shared, the interns contributed to the collective knowledge of the group and ways that they could practice in a classroom with only one teacher and a high school aged student aide. Through sharing these ideas they helped to expand Patsy’s repertoire for unit reviews and also to expand her utilization of student aides in her classroom.

Teaching and knowing collectively

Academics or theorists would not necessarily identify the collective knowledge shared throughout the meeting by the coteachers as easily identifiable bits of formal knowledge. Rather, through the course of ongoing discussion about practice, the teachers shared insights and understandings about practice. The ideas that were shared added to the collective pool of information with which the teachers worked. As a collective this shared body of information was larger than that known by any one group member. Furthermore, through these exchanges the interns were able to access the culture of and structures of the community and develop stronger understanding about practice in these contexts. Through coteaching the teachers together created a larger body of information to inform their practice and shape their developing approaches to their work.
Throughout the planning and implementation process the coteachers shared ideas and created a shared memory for informing their practice. Analysis of the interpersonal interactions of the participants showed an asymmetry in the types of information shared, the roles fulfilled and the levels of participation amongst the participants. Patsy had the most substantial understanding of the classrooms cultural practices and insight into the culture of the setting. This is to be expected—this was only the interns’ second week in the classroom. Patsy had greater understanding of the cultural practices and Discourse (Gee, 1992, 1996) of the community. As the interns spent more time participating in the coteaching community at Biden High they developed a greater understanding of the practices and cultural Discourse of the community (Fieldnotes; Coplanning and Seminar transcripts). These experiences working within the coteaching community of practice and participating in the work of coteaching provided the interns with opportunities to develop a greater understanding of cultural practice and develop identities as high school science teachers (Fieldnotes; Interviews). Analysis presented in chapters 6 and 7 illustrates the interns’ experience in the early weeks of the semester when they were participating in the practices of the community and moving from peripheral roles and understanding of practice towards fuller levels of participation.

As newcomers to the community, interns would not have the know-how (Orlikowski, 2002, p. 250), or cultural knowledge of the community, or what Gee (1992, 1996) calls Discourse to support full participation. Sociocultural theories of learning situate development within group members’ access and participation in the culture of the community (Brown, Collins, & Dugiud, 1989; Lave, 1996; Lave & Wenger, 1991;
Rogoff, 1995; Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995; Wenger, 1998), or through the process of contribution and shared contribution (Murphy & Carlisle, 2008; Stetsenko, 2008). Lave and Wenger’s theory of legitimate peripheral participation describes movement of newcomers from the fringes of community practices towards fuller participation in the work of the community. Asymmetry between newcomer and experienced community members’ participation and cultural knowledge has also been noted in other studies of community learning (Hutchins, 1995; Lave & Wenger, 1991; Rogoff, 1990), but not utilized in discussions of preservice teacher learning situated in cooperating teacher and student teacher interactions as applied in this study.

In sharing ideas, information, and insight into practice the coteachers created a collective sharing of information to inform and support their work. Furthermore, they enabled each other to develop insight into their perspectives of practice and ideas about what it means to practice. Through these conversations, participants accessed the culture of the community and also contributed to the collective understanding of the group knowledge, thus providing themselves and others opportunities to extend their insight into practice.

*The role of interpersonal processes in learning to teach*

In conclusion, the interns each taught two to four different courses for a total of five classes per day for five teaching days a week. Analyses presented in chapters 6 and 7 provides insight into the ways that the micro-community interpersonal interactions afforded learning opportunities for the coteachers at Biden High School during an experience coplanning and implementing instruction about muscles. These analyses
provide only a glimpse into the opportunities afforded for learning about teaching during some aspects of the muscle unit, however, both chapters illustrate the different ways that the participants negotiated their plans for practice, worked together to create group dynamics that opened up opportunities to participate as colleagues, took risks in the setting, and extended one another’s access to information that afforded opportunities to extend understanding of practice. Brown et al (1989) write, “Given the chance to observe and practice in situ the behavior of members of a culture, people pick up relevant jargon, imitate behavior, and gradually start to act in accordance with its norms. These cultural practices are often recondite and extremely complex” (p. 34). Analyses presented in chapters 6 and 7 provide some insight into the interpersonal workings of one of the coteaching micro-communities and suggest potential ways that coteachers work together to support the ongoing growth of participants and the multiple types of practices one might develop within a coteaching community of practice.
CHAPTER 8: CONCLUSION

This dissertation began with acknowledgement that the current standards and accountability reform movements have increased attention on student learning and teacher practice, and highlighted the need to prepare teaching professionals who are reflective and critically examine their practice in a way that supports their ongoing learning and improvement of practice. Many teacher education programs strive to develop teachers who are lifelong learners and are well prepared for the current reform efforts. Despite this, the student teaching experience, typically viewed as the capstone experience of teacher education programs, has been cited as problematic (Clift & Brady, 2005; McIntyre, Byrd, & Foxx, 1996; Wideen, Mayer-Smith, & Moon, 1998). Several issues are embedded within the experience including limited understanding of the nature of the learning that occurs within the field practicum setting. More specifically, however, research literature has also cited how traditional student teaching models promote a culture of isolated practice, limit preservice teachers’ voices and abilities to try out reform-oriented ideas taught in teacher education programs. Furthermore, the nature of the experience is idiosyncratic with the preservice teacher exposed to the perspectives and teaching context of one typically highly influential cooperating teacher. While new models for student teaching have emerged, these are not well studied and further evidence is necessary to understand the learning experiences provided within them. Furthermore, it has been suggested that shifting the research design of the student teaching experience to incorporate a broader scope of study and also a greater
understanding of the contextual factors of the learning experience may enable new understandings into the experience.

One approach for addressing the issues identified with traditional models of student teaching is through the development and implementation of alternative models. This study examines the experiences of a cohort of eight secondary science preservice interns who participated in an alternative model for student teaching. It explores the way that these participants became a part of a coteaching community of practice and learned about the process of teaching secondary science within this community. Furthermore, it examines the dynamics and processes of the professional learning community that developed. The four findings chapters sought to develop understanding of the nature of the learning experience for participants through analysis centered at the community and interpersonal planes of development. The goal of this chapter is to bring these analyses together and examine the implications of these learning experiences for the fields of teacher education, teacher learning and sociocultural frameworks for learning. Additionally, discussion centers on future directions for research as it specifically relates to this study and also more broadly in increasing understanding about coteaching as a model for learning to teach.

**Implications of learning to teach in a coteaching community of practice**

Feiman-Nemser (2008) notes that questions about teacher preparation have shifted in recent years from questions predominantly about what teachers need to know towards “What teachers should learn and be able to do” (p. 697, Feiman-Nemser citing
Darling-Hammond and Bransford, 2005). She identifies “four broad themes [for learning]—learning to think like a teacher, learning to know like a teacher, learning to feel like a teacher and learning to act like a teacher” (p. 698, italics in original). As the findings chapters in this study illustrate, through coteaching and working with and alongside other coteachers across the teaching day the interns developed these capacities through their development of the Discourses of the coteaching community of practice. Participants in this study learned to think like participating teachers. Furthermore, they also developed as reflective practitioners who problem-solved and adjusted practice as an ongoing part of their work, understood and recognized the complexity and uncertainty of practice, examined pedagogical possibilities for practice and thinking through the implications of practice, learned to draw on a wealth of resources to support their practice and incorporated a wide variety of pedagogical approaches in their teaching. Participants also learned to deal with issues of enactment (Kennedy, 1999) — they learned to juggle the many aspects and complexities of their work and the need to make multiple on-going decisions as a regular on-going part of their daily practice. As Darling-Hammond describes this,

Learning to teach requires that new teachers be able to understand and respond to the dense and multifaceted nature of the classroom—juggling multiple academic and social goals requiring trade-offs from moment-to-moment and day-to-day (Jackson, 1974). They must learn to deal with “the problem of complexity” that is made more intense by the constantly changing nature of teaching and learning in groups. (Darling-Hammond, 2006, p. 305)
One argument I make in this study is that coteaching afforded the interns with the opportunity to focus on aspects of practice that are not normally part of the experience of beginning teachers and student teachers. In their cotaught experiences, interns were able to sustain an increased focus on student learning and small group and independent work, which appears to have carried over into their consciousness and practices in solo courses. Furthermore, interns were able to move beyond the conservative pressures of practice (Lortie, 1975) and instead take responsible pedagogical risks by incorporating reform-oriented practices as an on-going pedagogical approach.

Working across multiple disciplinary micro-communities supported opportunities for interns to develop multiple frames of reference for their work. They were provided with opportunities to see numerous coteachers approach practice in different ways and also access to coteachers’ varying perspectives about practice. These experiences also reinforced a viewpoint that there is no single “correct” way to practice, but that multiple approaches can be successful or even appropriate in various situations. Furthermore, the interdisciplinary Coordinated Science courses at Biden High School reflect the need to teach a wide array of science disciplines to high school science students prior to taking their 10th grade state science tests. High school science teachers are certified in their disciplinary area, so interdisciplinary courses require them to teach out of content area for at least part of the course. Teaching out of content area is not ideal (Ingersoll, 2003, 2008) and also out of compliance with Teacher Quality federal policies (NCLB). However, the supportive and collaborative coteaching community at Biden High provided interns with opportunities to work with various disciplinary specialists to talk
about content and pedagogical approaches best suited for the other science disciplines that they were teaching. As a result they were able to utilize pedagogically appropriate approaches for each content area and received additional support regarding content. This is one example of how the coteachers’ capacity (Lieberman & Miller, 2008) for practice was strengthened by the coteaching network, and how cross-disciplinary practices moved across micro-communities in order to inform other coteachers’ practice.

Learning to be a part of a collaborative teaching community where teachers work together and support one another’s needs is an important learning experience for all teachers. As Bullough et al. write, “Most fundamental to the improvement of teacher education is addressing how all teachers are prepared to work with one another” (1999, p. 294, citing Howey and Zimpher, p. 294). Learning how to work collaboratively with colleagues and support one another’s learning processes has been found to result from participation in strong professional learning communities (Lieberman & Miller, 2008; Westheimer, 2008). Such learning experiences are critical. As Ball and Cohen (1999) argue, there is a need to recreate the professional learning curriculum so that preservice and inservice teachers learn to work in discourse communities so that they can examine and inquire into their practice in ways that stimulate a process of learning about practice in practice and move practice from an isolated process of accepting “the obvious” (p. 18) towards a “publicly deliberative process of inquiry and experiment” (p. 19). They argue that in order to achieve these goals, the culture of teaching and the way that people think about the nature of teacher practice in schools would need to be reinvented. Reinventing the culture of teaching would require that teachers be “counter-socialized” from
traditional norms of privacy and isolation, towards new views about practice—views that
value public practice, inquiry, and learning through practice and through work with
colleagues.

Within the coteaching learning community, the interns came to value
collaboration and colleagues as a way to support their practice and problem-solve. They
told me that it was not about “just being friends,” but about learning to work together as
professionals in order to best support the teaching and learning that occurred in the
classroom. This reflects what Lord (1994) calls, “critical colleagueship” and indicates a
willingness for community members to focus on their own growth and their students’
growth, and to be willing to work through issues of ambiguity and conflict. In fact,
interns who did not get along with their teaching partners remarked that learning to work
and learn together with colleagues whom they did not necessarily get along with was one
of the most valuable lessons that they learned during their experience. They believed that
this would help them in their future school contexts. Additionally, as each of the interns
spoke about their upcoming jobs they began to identify who they saw themselves
working with and how they anticipated that their future collegial relationships would help
them continue to examine their practice and grow as professionals.

As presented in this study, it is clear that the coteaching community of practice
provided a rich context for the interns to learn how to participate in and contribute to the
culture of practice of teaching science at Biden High school. Within the coteaching
community of practice, the disciplinary micro-communities, and the larger professional
communities in which it was nested, the interns developed identities of themselves as
science high school teachers who were reflective practitioners and life-long learners. Furthermore, as is discussed in the section that follows, they contributed to the existing teaching practices of their cooperating teachers and helped to expand the community’s collegial practices.

**Implications for sociocultural theories of learning to teach**

The typical perspective of socio-cultural theories of learning, particularly situated learning, is that such learning reproduces the existing culture through a process of enculturation (Brown, Collins, & Dugiuad, 1989; Putnam & Borko, 2000). Lave and Wenger (1991) suggest, however, that through the process of bringing newcomers into a community and through the introduction of new ideas, the community can be transformed through participant interaction. Stetsenko (2008) and Murphy and Carlisle (2008) further extend the notion of transformation in socio-cultural learning. One of Stetsenko’s critiques of most models of sociocultural learning, which she characterizes as situated in a framework of *relational ontology*, is that such models do not account for an individual’s agency in the world, or their potential to change or contribute to the existing cultural structures of the environment. Theoretical frameworks drawing on relational ontology situate learning in the individual’s participation and interaction in the environment. In contrast, Stetsenko argues that such models do not account for an individual’s agency or previous experiences and perceptions about the world. She posits that learning incorporates the process of interacting within the environment along with “the notion that collaborative purposeful transformation of the world is the core of human nature and the principled grounding for learning and development” (p. 471). Her
argument moves the process of learning and development from one of participation towards a view of interactive contribution, or what Lave and Wenger (1991) and Rogoff and colleagues (Rogoff et al., 1993) both refer to as transformation. Murphy and Carlisle applied Stetsenko’s ideas to the process of coteaching and cogenerative dialogues arguing that within coteaching transformation occurs through the process of *shared contribution*. Their work is the first writing within the coteaching literature to frame the mutual productivity of coteachers in this way. In the sections that follow, I expand on their work and theoretical frames of sociocultural development to show how within the coteaching community of practice the cultures of the community were reproduced, resisted, and also transformed. The implications of this for teaching, learning, and teacher education are then discussed.

*Reproducing culture*

As discussed throughout the dissertation and summarized in the section above, the interns developed many of the Discourses of the community—developing ways of thinking, talking, and acting like the experienced teaching members of the community. Studies that compare novice teachers and experienced teachers have found that it takes a long time for beginners to develop sophisticated ways of thinking about classroom practice and shaping classroom action that are commonly utilized by experienced teachers (Berliner, 2008/1992). While the interns were not as fluent as their more experienced colleagues, through the process of coteaching they were often able to access and appropriate the thought processes and approaches to classroom practice of more experienced teachers. It appears that through coteaching interns learned to operate in the
classroom in ways more aligned with their experienced colleagues than they may have had their field practicum teaching experiences been completed in more isolation.

Several theories have been used in the literature that are relevant to the community based learning processes of the coteachers. The experience of the coteachers could be understood through the lens of researchers who compare novice and expert classroom teachers. For example, Berliner described this learning process as “scaffolding… to help [novices] develop a greater degree of competence” (p. 808). The experience can also be interpreted through the work on learning within communities of practice by Lave and Wenger (1991). In this theoretical framework, the experiences of the coteachers would be understood as the development of membership through the process of legitimate participation in which newcomers move from the peripheral towards full participation in the work of the community. The experiences of the coteachers can also be understood in the context of the work of Gee (1992, 1996) as a process of developing the Discourse of the community. While each of these authors frame the learning process differently, they each are describing a process of development in which newcomers to the field develop ways of thinking and acting like the experienced members of the community thus carrying on the processes of the community. The paragraphs that follow further discuss the implications of the State University’s coteaching model for reproducing existing practices for the community of practice.

As I study have shown, group members acknowledged and discussed the complexities and uncertainties inherent in their practice. Together they problem-solved and adjusted practice as an on-going part of their daily practice. As the semester
progressed, the interns also used these practices in their solo classes, either adjusting plans for practice prior to class based on teaching experiences from earlier in the day, or making midstream adjustments to reflect what was occurring during the ongoing instruction. Additionally, the interns came to value collaboration and work with colleagues as a way to improve practice. They developed a sense of critical colleagueship (Lord, 1994; Westheimer, 2008) which moved interactions beyond congeniality towards an environment where the teachers saw each other “as a resource in the ongoing study and improvement of teaching, and learning” (p. 757). Furthermore, they reached a point in many of the coplanning meetings where they would debate the best way to approach practice, suggest alternative ideas, and some of the coteachers even openly disagreed and debated their contrasting philosophies of practice. Each of the points noted above reflect important ways that the culture of the community was appropriated by the interns particularly as these are all elements that can help foster on-going examination of practice and the development of an intellectual community (Westheimer, 2008) — all important outcomes of strong professional learning communities which can help to further the on-going capacity and development of community members (Lieberman & Miller, 2008). As Ball and Cohen (1999) have argued there is a need for a new pedagogy for teacher education—one which fosters a cultural shift from congenial norms of practice, and challenges traditions of teacher isolation and conservative classroom practice. It appears that several aspects of the coteaching community that were reproduced through the interns’ experiences in learning to teach reflect the types of learning and thinking that Ball and Cohen and others have argued are necessary for creating teaching professionals
who can be lifelong learners and thinkers in the context of their classrooms and their school community. These are not the only ways that the culture of the community was reproduced during the coteaching field experience.

As they approached planning for instruction, the interns also learned to utilize a wealth of resources to inform their work. Though sticking close to the curricular topics as delineated by either the textbook, cooperating teacher, or state curriculum, the interns and their colleagues regularly utilized the internet, university resources, alternative teacher materials, textbooks, and one another to develop new approaches for practice and to extend their pedagogy beyond suggestions from the curriculum teacher materials or historical traditions of the course. Like many of the experienced teachers in the learning community, the interns also came to value the different approaches and individual styles of their community members. They valued the opportunities to develop their own directions for practice in their solo class and they also viewed their development as an on-going pursuit to be further refined once they had their own classrooms. As the interns developed within this community of practice they became reflective practitioners who thought carefully about their pedagogical practices and the students with whom they worked.

Naturally, not every aspect of the coteaching community of practice was ideal, nor did every part of the experience serve as an ideal model for future practice. Wenger (1998), Gee (1996), and others have warned that learning within community can support the passing on negative aspects of the culture. Gee argues that becoming a part of a cultural community causes one to lose the ability to critique or question Discourses,
because one comes to view the world in ways aligned with the culture. For example, few of the interns questioned the tracking practices of the department, although it was recognized by the faculty and department chair that the high concentration of special education students in some of the Coordinated Science II and III inclusion courses was problematic, or non-ideal. These decisions were attributed to the administration and viewed as a situation to be dealt with. However, I never heard any intern question the higher percentages of minority students in these courses. Only Joe problematized the type of teaching and learning occurring within the Coordinated Science III classes that he taught with Joan and Pam. This provides an example of how culture, and community Discourses can reproduced within a community of practice. It should also be noted however, that critique of existing structures of schools in regard to issues of social justice or critical perspectives towards schools was not an emphasis of either the University teacher education program, or the science methods course that the interns took in the fall which tended to emphasize reform-oriented pedagogy, reflective practice, and collaboration through coteaching. Such an experience may have raised these types of issues to the interns’ consciousness, or potentially helped to open up these types of conversations — this could be a consideration for modifications to the teacher education program and ongoing research.

Learning within communities can be both positive and negative (Wenger, 1998; Gee, 1999, 1992). Furthermore, weak communities can be formed where congeniality is of utmost importance and participants are more likely to affirm existing practices than question or engage in “honest talk” (Lieberman & Miller, 2008). Due to power dynamics
between himself and his cooperating teachers, Joe mentioned his pedagogical concerns to me, but not his cooperating teachers. Similarly, this occurred within the Anatomy and Physiology micro-community where Bernadette and Luke did not feel that they had the space to voice their opinions or shape instruction in ways that they felt would best support student learning.

As Grossman et al. (2001) have found pseudo-communities can form in which people all behave as if they all agree while avoiding conflict. These types of communities limit opportunities for rich discussion about practice and opportunities for teacher learning about practice. What is interesting about this cohort coteaching field practicum experience, however, is that instead of just reproducing all cultural practices of the community, or keeping disagreements just below the surface, the interns also occasionally resisted what they experienced. On many occasions when interns did not feel comfortable talking about dilemmas directly with a cooperating teacher, or in large public forums such as the on-site seminar, they found that they were able to discuss questions or issues with other cooperating teachers and their cohort peers.

*Resisting culture*

Although the interns adapted many of the cultural norms, practices, and expectations of the teaching community, within this space they also resisted and challenged some of the things that they experienced. In some ways the community stance towards individuality created a space for resistance, in that differing opinions were valued and shared across the community. Also, some of the cooperating teachers
illustrated resistance and challenges to larger community practices and administrative power structures, showing that resistance was acceptable and appropriate. In the space below I will quickly highlight three examples of ways that interns resisted practices of the community during their coteaching semester and then follow-up with discussion about the value of these actions.

One of the obvious ways that interns resisted cultural practices of the community was apparent in their decisions about how to spend their lunch break. Many of the interns first began eating in the faculty lounge with teachers from across the high school. However, interns quickly found this to be a negative environment in which teachers complained about students, school practices, and the administration (Interviews, Fieldnotes). As the semester progressed, the interns removed themselves from this setting, choosing instead to spend their time with other faculty members who ate in Vincent’s classroom and were more focused on getting a break in the day and enjoying their time with each other. As a separate example, Joe questioned the pedagogical approaches in the inclusion classrooms. He found the heavy reliance on worksheets and emphasis on breadth over depth to be highly problematic. However, working with the department chair and another cooperating teacher provided little space for voice and critique. He felt little room to challenge the classroom practices and instead vowed to utilize different approaches in his own classroom the following year (Joe, Interviews, March and May). Finally, throughout the semester Bernadette and Luke strengthened their commitment to inquiry-oriented instruction, laboratories, and assessment in response to Anne’s traditional and directed approach towards instruction. Together,
Bernadette and Luke remained committed to inquiry-oriented science and worked to negotiate aligned pedagogical practices into classroom instruction. Despite their perceptions of limited voice and curtailed influence in shaping classroom instruction, Anne remarked that she had learned significantly from working with the interns noting that through coteaching with the interns she expanded her teaching practice, and engaged in risk-taking as a regular part of her teaching. This is particularly important because, as Featherstone et al. (1993) have noted, the school culture can have a strong negative influence on even exemplary student teachers. Being able to find alternatives, or remain strongly committed to teaching philosophies developed and theories learned in University settings across the field placement experience is an important finding.

I consider Bernadette and Luke on-going committed to reform-oriented practices even when not supported by cooperating teachers to be an extremely important finding. Numerous factors may have supported their commitment, including the peer relationship, opportunities to implement hands-on activities within their Environmental Science micro-community, and the strong support of Frank, their clinical supervisor. Kennedy (1999) has argued that when preservice teachers are taught to teach in reform-oriented ways, they face a dilemma resulting from their apprenticeship of observation (Lortie, 1975) which is most typically grounded in traditional practice. Such traditional development experiences do not provide frames of reference for teaching in ways aligned with reform-oriented practices. This creates problems for classroom implementation that are compounded when preservice teachers work in classrooms such as Anne’s that do not typically utilize these practices. Furthermore, research into the field practicum experience
has shown that student teacher voices are often silenced in their work with cooperating teachers (E. R. Smith, 2005, 2007) and that theory from the university is often “washed out” during these times (Zeichner & Tabanick, 1981). This dissertation illustrates that through the coteaching experience with the ongoing support of peers with mutual commitments to inquiry-oriented science (along with the support of the clinical supervisor), the interns were able to continue to value and push for reform-oriented pedagogies. They were also able to integrate such pedagogies into practice and did so more often than their cooperating teachers typically did on their own. These data illustrate that the interns were able to create classroom situated reform-oriented frames of reference and develop understanding of how inquiry oriented science could be utilized in high school science classrooms. Additionally, they were able to hold onto these values as they projected forward and anticipated their work in their future classrooms (Intern Interviews, May 2005).

Early in the semester Bernadette explained to me that the interns were an active part of the coteaching community of practice, yet they also did not exactly fit in. From her perspective the interns were a “new generation” of teachers with different perspectives about teaching and learning from their cooperating teachers. As she explained in an interview following her fifth week of coteaching,

*I feel like we are a new breed, almost, a new generation. The co-ops seem like real traditional, old school-textbook reading and worksheets, but all of us [interns] have ideas. We are fresh off the boat with things to do. We are always encouraging each other to do labs and demonstrations. Samantha is talking about how she is always doing demonstrations and hands-on activities with Patsy, but Anne is more like, “Here is a worksheet,” whereas I would just do something totally different. I am more hands-on, “Let’s do an inquiry lab.” And I do not get a lot of that with Anne and Vincent….*
I think throughout our education classes, we have been stretched to the extreme. They have always said, “Try to be different. Think outside the box.” I feel like all of us are like that with the lessons that we come up with, our new ideas and the message that we use and especially inquiry learning…. I do not think the co-ops were taught things like that. [During the science methods course] we get to look at so many different aspects of teaching science. I think Claire has a lot to do with it, and just this whole research thing. I feel like we are a little more open-minded. We are ready to get out there and change the world, or try to at least…. (March 12, 2005).

Within this quote she describes what she sees as significant differences between the interns and the cooperating teachers, differences that she attributes to their differing educational backgrounds. Furthermore, she discusses the interactive nature of the community; she cites Samantha’s sharing of her teaching experiences with Patsy as an illustration of how interns shared their teaching experiences. Clearly not all coteaching experiences were the same. Yet for Bernadette and many of the interns, their cooperating teachers tended to lean towards more traditional notions of pedagogy and epistemology than they had developed during their experiences at State University (Fieldnotes, Intern Interviews). Bernadette held onto this view of “generational difference” regarding the key pedagogical differences between the interns and the cooperating teachers throughout the semester, drawing on the phrase, “the new generation” again in her final interview at the end of May. Despite prior research on the full practicum experience, which suggests that cooperating teachers are powerful influences on preservice teachers, Bernadette’s experiences and quotes illustrate one way that generational differences remained across the coteaching practicum semester.

Each of the eight teaching interns worked throughout the semester to implement an inquiry stance in their cotaught classrooms and completed the full practicum with a
strong commitment to reform-oriented pedagogy. Perhaps it was the power of the peer group, or the fact that the interns were members of multiple communities throughout the coteaching experience, or that the community of practice valued the multiple perspectives and approaches of different community members. Regardless, the interns were able to see and hold onto their practices and values in juxtaposition to those of many of the cooperating teachers who had more traditional tendencies. In contrast to the work by Gee (1992, 1996), which argued that part of becoming a member of a community means loosing the ability to distinguish oneself from the group’s collective identity, these interns were able to become members of the teaching profession and develop identities of themselves as high school science teachers. Perhaps this was because as Bernadette explained they were a “new generation” — newcomers to the field — who shared commonalities with the previous generation of teachers through their professional roles, expectations, and commitment to the teaching of science to high school students, yet they were also distinctly different in their theoretical backgrounds and understandings about what it means to teach and learn science in the 21st century. Perhaps these differences backgrounds and the cohort experience supported a sense of membership in multiple communities and hence the ability to hold onto commitments to reform-oriented practice. Regardless, as a cohort, the interns developed a strong sense of themselves as thoughtful professional high school science teachers who could actively shape their contexts. As a group they believed that they could improve student learning through the pedagogical decisions they made in the classroom. Their sense of themselves and views for future practice were strongly grounded in the practices of the coteaching community of practice,
however they also saw themselves as distinct and separate practitioners with individual views about how they should approach classroom practice. What many of them did not fully appreciate was that through their involvement in the coteaching community they contributed to the culture of the community and helped to create new perspectives about what it meant to teach and learn science at Biden High School. As I explain in the next subsection, as a collective the coteachers were able to transform the existing practices of the community to reflect a different culture of practice.

Transforming culture

Part of learning in and with others is the process of transforming, or contributing to, the culture of the community through the sharing of new ideas and discussions about their work (Lave & Wenger, 1991; Murphy & Carlisle, 2008; Stetsenko, 2008). Murphy and Carlisle (2008) refer to this as a process of shared contribution. Applying Stetsenko’s theory of transformative activist stance directly to coteaching applications, they write,

Coteaching and cogenerative dialogue provide expanded opportunities for transformative action in learning and development through shared contribution, collective responsibility, expanded agency and the active promotion of teach other’s agency and co-development. Coteaching and cogenerative dialogue also create… ‘spaces’ for such interactions to occur (pp. 504-505).

The structures of State University’s coteaching model and the intern’s involvement in the professional learning community created opportunities “for transformative action in learning and development” by changing the existing culture of practice of the coteaching
science teachers at Biden High School from the typical traditional culture of classroom isolation (Little, 1990; Lortie, 1975) towards one of mutual meaning making and shared practice. This had implications for the learning and capacity of all members of the coteaching community. As the coteachers worked together, practice moved from an independent and individual process of teaching toward a negotiated, mutual collective one. Through coteaching practice, practice became an open and public process. This created a context for supporting risk-taking (Gallo-Fox, in press) and an environment for experimentation and learning for all participants. This was a mutual multidirectional process, and one that enabled all participants to think about and understand their practice in new ways. Each of these contextual shifts had important implications for affording learning opportunities and in contributing to the professional identities of coteaching community members. These points are discussed below and the implications of these are expanded upon.

Coteaching was not a typical mode of practice for any of the interns or cooperating teachers. Five of the eight cooperating teachers had cotaught with interns for one semester the previous year\(^\text{17}\). Some of the cooperating teachers worked with a special education teacher in their classroom one period each day to teach a science inclusion class, and Pam the department chair taught several inclusion classes with Joan. However, even in the inclusion classes the teaching practice did not resemble the coteaching that occurred within the State University model. Regular teaching practice throughout the school and science department reflected a typical model of teachers teaching their classes

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\(^{17}\) Patsy, had begun the semester, but left on maternity leave two weeks into the coteaching experience.
independently (Fieldnotes, Cooperating teacher interviews). Except for one short micro-
lesson that the interns had developed and implemented with their coteaching intern
partner during the Fall methods course, none of the interns involved in this study had ever
cotaught prior to this experience with the. Additionally, while interns had viewed some
video footage of coteaching in a high school, their exposure to coteaching was limited to
their cotaught science methods course the fall prior to coteaching and reading and
discussion of the coteaching research literature (Intern interviews, Fall 2004). As a result,
the coteachers drew on their limited backgrounds of coteaching, and together through
their on-going discussions of practice created mutual understandings of what coteaching
would mean for them in their shared classrooms.

Throughout the semester, classroom practice was co-constructed by coteachers
during coplanning meetings and in formal and informal conversations throughout the
instructional day. As I have presented across this dissertation, the practices of the
coteachers were continually negotiated and co-constructed by the community
participants. This was an ongoing, recursive process, which unlike many traditional
student teaching experiences was not top-down, or necessarily directed by the
cooperating teacher (Feiman-Nemser & Beasley, 1997). Furthermore, the interns largely
felt that they had a voice in the process. In many of the micro-communities, interns spoke
up freely discussing their ideas and perspectives as part of the group (Intern interviews,
March and May). Teaching in this context was a collective process in which the shared
knowledge of the community was a mutual construction. The group’s collective
knowledge provided a support structure and larger scope for knowing than available to
any of the individual coteachers. In other words, knowing was situated in and supported by participation in the context.

The process of coteaching moved the act of teaching into a public arena. As Patsy commented, “It’s like my brains are coming out in the open” (Seminar, May 10). In opening up the private side of practice (Britzman, 1991), the coteachers shifted the isolated practice of teaching to a public forum for thinking about, discussing, and practicing. Lieberman and Miller (2008) have described how this occurs in strong professional learning communities and argue that it is valuable because it creates an arena in which teachers can support the ongoing learning and intellectual pursuits of their colleagues. In the coteaching community of practice, this lead to environment for supported risk-taking (Gallo-Fox, in press) and contrasted with the traditionally conservative nature of teaching practice (Lortie, 1975). The experience of learning to teach in a public arena created a sense of vulnerability and exposure for the interns who were experiencing many firsts and challenging themselves in their daily practice. The cooperating teachers experienced risks when they cotought with interns and expanded their pedagogical repertoire. Taking chances within this public arena required a large degree of trust in fellow coteachers. The general tenor of the coteaching community of practice reflected a culture of support and encouragement that enabled participants to take on these new challenges. Furthermore, the ways that coteachers talked about practice, worked to expand pedagogical repertoires, or inquired into one another’s thinking typically afforded on-going learning opportunities. Over the course of the semester regular experimentation with new pedagogies in classroom instruction, discussing
uncertainties of practice, learning alongside each other became a regular part of coteacher practice in many contexts (Gallo-Fox, in press; Gallo-Fox, Wassell, & Scantlebury, Submitted). The extra support that resulted from the coteachers collective responsibility for practice enabled coteachers to take on new challenges, or chances within their practice. As Anne [cooperating teacher] said, “I was much more willing to take risks.... Somebody had your back, for lack of a better phrase” (Interview, June).

Writing about the importance of classroom environment, Kellermeir (1996) describes the value of creating learning contexts that support risk-taking by making participants feel comfortable to participate in the intellectual work of the classroom. Kellermeir and Grossman et al. (2001) draw on notion of midwifery in their writing about learning communities and the ways that “the group assists in the birth of new ideas. For such births to occur, the group must provide a safe environment in which individuals are free to voice uncertainty, explore ideas, and state, and retract opinions” (Grossman, Wineburg, & Woolworth, 2001, p. 984). The collective efforts of the coteachers to support risk-taking also served as a form of midwifery. The coteachers, working in concert, helped one another deal with the uncertainty and vulnerability experienced within practice to develop confidence and experience success as they took risks in their classroom. The results were new understandings for practice and successful experiences that further fostered willingness to talk about practice and expand classroom instruction.

Ball and Cohen (1999) called for a new pedagogy for teacher education that could help to change school-based culture in order to create environments that would provide opportunities for teachers to critically examine their practice and beliefs and learn along
with others. State University’s cohort model of coteaching appears to have helped to create a community of practice that fostered many of the practices that Ball and Cohen argued essential to fostering on-going professional development within school settings. Through the establishment of a multi-generational culture of professional practice and on-going learning within practice, this experience afforded the potential to impact the future learning and practice of cooperating teachers and future interns and students with whom they would work, as well as provide opportunities for on-going implementation of these practices in the future classrooms and schools of the interns. These ideas are further developed in the paragraphs that follow.

Both cooperating teachers and interns learned through the process of teaching and working together. Learning and thinking about practice was a mutual multidirectional process. Although some of the research literature on professional development schools also suggests that cooperating teachers learn through the experience of working with preservice teachers, this contrasts with most of the research literature on the student teaching experience, including a coteaching study (Roth, Tobin, Carambo, & Dalland, 2005), which describes the process of learning to teach as unidirectional with interns learning only from their more experienced coteaching counterparts.

Darling-Hammond (2006) comments about need for teacher education programs to help improve the school contexts where preservice teachers engage in their field experiences. She writes,

Developing sites where state-of-the-art practice is the norm is a critical element of strong teacher education, and it has been one of the most difficult. Quite often, if
novices are to see and emulate high-quality practice, especially in schools serving the neediest students, it is necessary not only to seek out individual cooperating teachers but also to develop the quality of the schools so that prospective teachers can learn productively. (p. 309)

The core of her argument centers around the need to create rich learning environments in which preservice teachers can experience state-of-the-art practices and participate in successful teaching cultures in order to support their learning experience and help to shape their future practice. Creating change in schools is difficult at best (Sarason, 1996), but necessary if we are to successfully support the learning experiences of new teachers and the ongoing learning of students.

Rogoff, Baker-Sennett, Lacasa and Goldsmith (1995) write that the sociocultural practices developed within communities reflect past, present, and future actions. They postulate that cultural development has implications for future practice — as people shape on-going actions and decisions they draw on previous patterns of practice and understandings about participation. It seems likely that practices borne from the coteaching experiences were brought forward into a subsequent setting and helped to shape their practice in these new settings. Coteachers’ successful experiences teaching hands-on inquiry science provided a knowledge base for future practice. Taking collegial risks in opening up one’s practice and sharing classroom experiences also afforded opportunities for further growth and development in new settings. Experiences within the science coteaching community could be drawn upon in future practice and used to shape work in new settings.
Evidence exists that the pedagogical risk-taking shaped the cooperating teachers’ practice even when the interns were no longer members of the community. In a personal email communication with Patsy in December 2007 she wrote, “I have used the sarcomere activity every year since it was piloted. The kids do really well with it.” The fact that Patsy continued to utilize the sarcomere activity in the two years following her work with Samantha and Sean provides evidence of how these curriculum development activities impacted her practice even after the interns had left the classroom. It illustrates the shared contributions of the coteaching group towards her expanded curricular and pedagogical practice and her on-going willingness to incorporate what she had initially perceived as “risky” into her practice. Furthermore, it illustrates how the coteachers’ collaborative practice contributed to the learning experiences of future classes of Anatomy and Physiology students and also the additional pairs of teaching interns who worked with Patsy each of those years. Through their work together the coteaching group from 2005 contributed to the classroom learning of future students and coteachers at Biden High. Other coteachers also utilized curricular and pedagogical changes in successive years. Vincent used opportunities for developing labs with interns to shape and impact his future practice. Bill, a more teacher-centered practitioner explained that the interns helped him diversify his practice, and that he intended on drawing on the lesson plans that the group had developed in future years. Finally, Anne, one of the most traditional cooperating teachers in community, remarked that her work with interns pushed her to think in new ways and expand her practice.

Interns were not followed longitudinally into their own classrooms. It is unknown how the interns’ identities and practices shifted as they moved into their new settings.
However, data from interviews indicate that all of the interns valued the inquiry-oriented, hands-on pedagogy that they used while coteaching and believed that such approaches were important to enhancing student learning. Furthermore, interview data suggests that each of the interns (even those who had most resisted the collaborative coteaching experience) strongly valued collegial interactions as a way to extend practice, to examine problems, and to improve their work in the classroom. While we do not know exactly what they did when immersed in new teaching communities, the data suggests that these new teachers hoped to utilize collegial networks to support and improve their efforts.

Additionally, a study which followed State University’s first coteaching cohort into their first year of classroom practice found that when the preservice teachers moved into their own classrooms, each of the beginning teachers reported moving beyond their classroom walls to seek out and create collaborative networks (Juck, Scantlebury, & Gallo-Fox, in press). To varying extents, those first-year teachers each contributed to the culture of their new settings by creating networks and forums for working with colleagues in order to better inform their practice. Each of the five graduates of the coteaching cohort that moved into the classroom that year\(^{18}\) drew upon the collegial practices of coteaching to shape their own practice and that of their fellow teachers. These first year teachers established teacher networks for sharing ideas and developing labs. One of the program graduates even became a teacher leader among the other first-year teachers at her school; her experiences with coplanning helped her to lead the group as they developed new curricula for their program. Another graduate was the only chemistry teacher in his high

\(^{18}\) The sixth cohort member, Juck, studied the first year teaching experiences of his cohort members for his
school. He reached beyond the walls of his school and found a colleague in another school in the district with whom he regularly communicated about practice.

This study’s findings about the ways that the interns shaped the learning experiences of all community participants can be used to help extend sociocultural theories of learning. In theories of situated learning experiences and relational ontology (Stetsenko, 2008) it is frequently argued that learning processes within situated contexts reflect a process of enculturation, or cultural reproduction. The findings about the coteaching community of practice extend the work by Lave and Wenger (1991), Rogoff and colleagues (Rogoff et al., 1995), Stetsenko (2008), and Murphy and Carlisle (2008) to specifically illustrate how sociocultural experiences provide opportunities for transformation of existing community practices and the knowledge of the community through the shared contribution of all participants within the setting. By acknowledging the way that newcomers can alter participation structures, expand group collective knowledge and capacity, and stimulate learning experiences, these findings present one approach that can be used to help improve the experiences of all teachers and students within field-based settings.

**Considerations for teacher education, teacher learning and practice**

Coteaching contexts provide rich possibilities for transforming the traditional field practicum model through the ways that preservice and inservice learning are afforded within the model and through the potential to strengthen the use of reform-oriented pedagogies and the development of cohesive learning communities within the

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Master’s degree research thesis.
practicum school settings. Furthermore, coteaching creates the possibility for helping preservice teachers develop into practitioners who will move into new contexts where they can continue to draw on the tenets of coteaching and create supportive, collaborative contexts for transforming the learning of the participants within their new settings (Gallo-Fox, 2009; Juck, Scantlebury, & Gallo-Fox, in press; Wassell & Lavan, 2009). This study illustrates both the possibilities of the coteaching model for addressing issues of the field and also some of the difficulties embedded within such an experience.

In the section that follows, I further expand upon study findings to discuss several considerations for future use of the cohort model of coteaching as an alternative model for field practicum. I begin with discussion of the ways that two peripheral coteaching community members, a clinical faculty member and a researcher impacted the intern experiences within the Biden High coteaching community of practice. I then provide specific suggestions about ways to strengthen State University’s coteaching model. I conclude with discussion of warnings and concerns that have been raised about the use of professional learning communities as models of practice and relate these concerns to specific findings from this study.

Research on teacher education programs has emphasized the importance of coherence and consistency of message across the teacher education program, particularly when programs emphasize innovative practices (Wideen, Mayer-Smith, & Moon, 1998). One way that the programmatic emphasis of reform-oriented pedagogy was supported across the field experience was through the efforts of Frank Baker, the biology clinical supervisor, who was a former high school science teacher and also a participant in the
development of the hands-on inquiry oriented state science curriculum. He continually emphasized inquiry-oriented science in his exchanges with interns (Fieldnotes, Intern interviews). He frequently spoke about ways that interns could incorporate more laboratory experiences and discovery-oriented practice into their existing curriculum, and he shared additional lesson materials and laboratory activity resources with the interns (Fieldnotes, Intern interviews). Additionally, Frank led a whole group seminar session around integrating inquiry science activities into the curriculum at the University (Seminar, 4/19/05. All of the interns, regardless of supervisor or disciplinary background, cited Frank’s strong support towards inquiry-science as a factor that supported their commitment to these practices. This shows one way that clinical supervisors can support the messages of teacher education programs while helping to counteract the tendency of the field experience to “wash-out” the theories and ideas emphasized in teacher education programs (Zeichner & Tabanick, 1981).

Sociocultural research and studies of situated learning emphasize the importance of researcher reflexivity as a part of analysis. I was affiliated with the program as a third party researcher studying the implementation of coteaching model, and I was the most visible non-teaching participant in the coteaching community at Biden High. (For example, during the last two months of the study, I was at the school as many as four full days a week.) As Tobin and Roth (2006) have argued, in coteaching research methodology a researcher and teacher educator cannot fully understand coteaching experiences unless they participate in the activities of practice. While I did not become an active coteacher in daily instruction, I did help out in the classroom occasionally when
the need arose, such as when activities went awry (March 3, 2005), or during the
Anatomy and Physiology fetal pig dissection labs (May 10th and 11th, 2005). Generally
however, my participation within the coteaching community practices was guided by my
stance as a researcher and teacher educator. Working within a feminist ethic of care
(Noddings, 2001) my goal was to support and give back to research participants who
were providing me with rich access into their classrooms and experiences. I provided
feedback to interns when they requested it, and was regularly available to talk to
participants about their experiences. I was in touch with the interns via email and
telephone on a regular basis, regularly answered questions about teaching and the
University program, and provided a confidential sounding board as interns sought to
address issues in their classroom and work out interpersonal dilemmas with coteachers.
Though I was not responsible for assessment or grading in any way, I facilitated the on-site Seminar attended by the coteachers. On occasion I did notify Claire, the program administrator about concerns about issues that needed her attention or needed to be addressed – such as when the Coordinated III coplanning sessions were not functioning well and her attention was needed to help improve the situation. Much to my surprise, in their close out interviews, both cooperating teachers and interns thanked me for my help and support throughout the semester.

In many ways my involvement with the coteaching community was similar to that
of an on-site university teacher educator or clinical faculty member. I had a rich
understanding and involvement with the practices of all community members, was
regularly present in the classroom settings, and supported the coteachers practice when
asked. I was on-site more regularly than either the clinical faculty members or the program administrator, who was always accessible by email. Perhaps, my involvement may in fact best reflect the engagement of faculty in PDS models who are assigned to the community school and involved with the ongoing learning and proceedings of all participants. Through my regular participation in the community experience, I was able to gain rich access to the experiences of the coteachers and was able to support their ongoing efforts and learning experiences due to my strong familiarity with their work, challenges, and the coteaching context, as well as our on-going conversations about their practice and what they were learning. Murphy and Beggs (2006) have argued that within coteaching it is important for researchers and university classroom participants to have a non-evaluative role in the classroom setting. Perhaps my unique position, along with my knowledge as a teacher educator, enabled me to support the interns and their cooperating teachers in a way that neither the supervisor nor the program administrator could. Regardless, these experiences warrant further consideration in the development and shaping of existing coteaching models. Clearly, participants believed that through my frequent involvement in the classroom, and my supportive approach towards their practice I was able to help foster their learning experiences.

I have several suggestions for further strengthening the learning experiences of interns who participate in State University’s cohort model of coteaching. First of all, as part of this study I noticed that programmatic requirements helped to facilitate certain types of thinking and teacher talk within the community at Biden High School. For example, weekly lesson plans required formal and informal assessments and links to the
state science standards. These requirements promoted ongoing thinking about these topics throughout the semester (Fieldnotes, Coplanning Transcripts, Seminar Transcripts). Additionally, reflective teaching assignments which required that interns video-tape themselves teaching a lesson and then analyze and write a critical reflection of their practice opened up conversations among interns both before and after the assignment deadlines. This activity opened up a debate between Sean and Samantha about which lesson would be a better lesson to record and reflect upon (Fieldnotes, March 3, 2005). At the core of the conversation was debate about “good teaching” and what one would gain from such a reflection and also what aspects of practice one would want to share as part of a formal assessment (for further discussion of this exchange see Gallo-Fox, in press). One of the things that we have found about the coteaching experience is that time is a precious commodity in the coteaching classroom (Scantlebury, Gallo-Fox, & Wassell, 2008). Coteachers remarked that is that there is never enough time to reflect on experience and for teachers to deconstruct what was happening in the classrooms (Fieldnotes, Intern and Cooperating teacher Interviews). At one point in the semester, Tim (cooperating teacher) expressed his frustration that he and the interns had not had the time to sit down and examine the recent test to talk about the areas of student strength or weakness (Fieldnotes). Although teachers talked all day long, they frequently were pinched for time for these types of extended conversations and for extended opportunities to collectively reflect on student assessment (Fieldnotes). As Little and Horn (Little, 2003; Little & Horn, 2007) have written, time for such conversations is rare in the everyday activities of teachers’ work lives. Lampert and Ball
(1999), Sykes (1999) have written about the importance of teachers using authentic assessments to inform their ongoing development and learning about practice. I believe that adding a required assignment to examine a classroom assessment and student outcomes as a requirement for the program, would help to foster extended coteacher conversations about student assessments. It would also ensure that coteachers set aside time to examine some assessments and utilize their findings in order to inform their ongoing work with students. These experiences would support the intern learning experiences and also support future use of authentic classroom assessments to inform and shape ongoing practice.

One of the reasons Claire Lyons chose to shift the program’s model for student teaching towards a coteaching model was because she believed that this model would support foster the interns’ development of reflective practice (Interview, November 2003). The development of reflective practice is evidenced by the data. The teachers’ reflective and thoughtful approach towards their work, their ongoing use of problem-solving to address classroom dilemmas, and their ongoing adjustment of instructional plans throughout the day illustrate ways that they incorporated reflective practice in their work. Furthermore, the coteachers actions reflect many of the ideals of an inquiry-stance approach towards practice as described by Cochran-Smith and Lytle (Cochran-Smith & Lytle, 2001). I believe that the coteaching experience could be improved by programmatically embracing action research, or an inquiry stance in which the interns and community members collect and utilize classroom data to inform their practice. This would provide valuable learning experience and long-term practices that would inform
professional efforts of the interns. A final recommendation for improving the program at State University is to incorporate a more critical lens into the coursework and practices of the coteaching community. With its current emphasis on reform-oriented pedagogy and reflective practice, interns were not inclined to take a critical stance towards examining the practices of the community such as the tracking practices and surface level low-skills based instruction in inclusion classrooms. Only one intern, Joe, questioned these practices. Perhaps, if the science methods course or the teacher education program as a whole supported critical conversations about these practices, included readings about these topics, or included more of a critical perspective around school contexts, then more interns may have questioned these practices in their cotaught classrooms.

Two points raised by Hargreaves (2007) and others about the implementation and current use of professional learning communities need to be mentioned and considered in the ongoing use of cohort coteaching models as an approach for learning to teach. First of all, Hargreaves (2007), and Grossman, Wineburg, and Woolworth (2001), and several others who have studied professional learning communities (Kruse & Louis, 2007; Lieberman & Miller, 2008), warn that it can take a couple years for community relationships to develop so that participants can have productive conversations about practice and develop levels of trust that support open conversations and be comfortable working through disagreements. Time necessary for relationships to develop cannot be rushed, nor can it be assumed that groups will form rapidly. Despite this, Lieberman and Miller (Lieberman & Miller, 2008) writing about the National Writing Project describe one example of a group that formed within 5 weeks (p. 12). The coteaching community
of practice appears to provide another example of a cohesive group that was able to develop tight, productive relationships quite rapidly — as evidenced by many of the February 17th coplanning sessions that occurred the ninth day of the coteaching semester. Despite the cohesive nature of many of the disciplinary micro-communities, not all groups developed strong relationships of co-respect (Scantlebury, Gallo-Fox, & Wassell, 2008) or were able to open up “honest talk” (Lieberman & Miller, 2008) as quickly, or only in a limited manner. Several interns had a difficult time gaining the respect of their cooperating teachers and group relations were something that all participants worked to maintain across the semester (Fieldnotes, Interviews).

While specific issues of community development and cohesion were not studied in this research, data does suggest that a number of factors may have helped to support the rapid development of community trust and micro-community cohesion. The interns arrived at Biden High filled with questions about teaching, the curriculum, and classroom routines and structures. They acknowledged the cooperating teachers’ experience and believed that they had much to learn from them about teaching. During the early weeks of the semester they asked cooperating teachers many questions about classroom routines, expectations, students, and learning how to work within the classroom setting. The interns were eager to learn from their experienced counterparts and also quick to begin participating in classroom practice. However, with coteaching as the model of practice, these teachers also needed to create structures for sharing their practice and opening up a forum for negotiating their work together. The rules of cogenerative dialogues (LaVan & Beers, 2005) and shared responsibility (co-responsibility) and co-respect were
emphasized from the onset of the semester and the expectation was that interns would get involved and assume classroom responsibility starting the first day of the semester. Furthermore, the University program positioned the interns as content specialists, teachers and knowers, and these were sentiments that the interns brought with them to Biden High. Though they knew they had much to learn about teaching, they saw themselves as content experts with strong understanding of inquiry science. Although they were new to the classroom, they believed that could contribute to instruction in valuable ways. They had learned about theories of capital and social capital in their methods course and were informed that early weeks on-site were critical for developing a rapport with their cooperating teachers and developing capital. Their enthusiasm and commitment to learning to teach and the cooperating teachers’ enthusiasm about the program and their warm welcome of the interns helped to open up space for the collective cogeneration of practice. This context provided the trust necessary for the coteachers to share their practice and learn together.

Despite the promise of professional learning communities for their rich potential to foster teacher learning, and the potential of the cohort coteaching model as a way to support both preservice and inservice learning within professional learning communities [PLCs], it is important to acknowledge that PLCs are innovations that can be easily integrated in school settings (Hargreaves, 2006, 2007; Louis, 2006). The decision to shift to a coteaching model for the field practicum was an administrative decision made by Claire Lyons, the University program administrator, supported by Pam Alder, Biden High’s Department Chair, and approved by the principal at Biden High School. These
structural shifts in the field practicum experience created a new model for collaborative practice and partnership of interns with multiple coteachers. However, the community of practice that evolved within these structures emerged organically through the work of the coteachers. It was the coteachers who built their cohesive relationships, necessary levels of trust, and collectively constructed their own visions for their practice together. Within this context the coteachers developed their practice together and shared ideas across micro-communities. Darling-Hammond commented about needing to impact school contexts, it appears that in addition to PDS schools, coteaching models such as these can provide a venue for creating change.

Overall, however, the coteaching model created a rich learning environment for the interns and cooperating teachers alike. It fostered rich teacher conversations and helped interns conceptualize their work as part of a community of professionals committed towards student learning. Through their experiences, interns came to view collegial conversations as opportunities to question and improve practice. Additionally they understood teaching as a complex and uncertain process. Within this coteaching community of practice these coteachers shifted the culture of teaching which typically fosters a congenial culture in which getting along is more important than learning and questioning practices and belief structures (Ball & Cohen, 1999). As Ball and Cohen have argued these cultural shifts are necessary to support ongoing contexts for teacher learning and professional communities that foster rich examination of practice.

Participating in these cultures and learning to conceptualize their work with colleagues provides an important scaffold for future practice in new settings. As Rogoff et al.
(Rogoff, Baker-Sennett, Lacasa, & Goldsmith, 1995) have argued these learning experiences will provide important underpinnings for how they will approach their work in future contexts.

The science community that the interns’ participated in was previously viewed as a collaborative department open to innovation and change (Pam Interview, October 2003). Although the involvement of the interns further facilitated networked and collaborative learning and pedagogical change, as Siskin (1994) has noted collaborative departments are not typical in high school settings. It is unknown how such a model of coteaching would be accepted and incorporated into the practices of a different high school community. This is one area for further research, there are others. The section that follows examines future directions for research and writing for extending the current study of State University’s cohort coteaching model and also other work on coteaching as a model for learning to teach.

**Future research directions**

Although coteaching as a model for the delivery of special education services has been utilized since the 1970s (Bacharach, Heck, & Dahlberg, 2008; Martin, 2008), the coteaching model for learning to teach differs greatly in both the intent and theoretical underpinnings and has only been utilized and studied for a decade (Tobin & Roth, 2005). Research on the use of coteaching model as an approach for learning to teach has studied implementation of various coteaching models in multiple settings throughout the United States (Bacharach, Heck, & Dahlberg, 2009; Eick & Dias, 2005; Eick, Ware, & Williams, 2003; Emdin, 2006; Lehner, 2006; Martin, 2008; Roth & Tobin, 2002, 2005b;
Scantlebury, Gallo-Fox, & Wassell, 2008) and internationally (Murphy, Beggs, Carlisle, & Greenwood, 2004; Roth, Masciotra, & Boyd, 1999). Several commonalities have been found across settings such as the potential to increase teacher and student agency in the classroom, an increased focus on student learning fostered through coteaching conversations, and enhanced reflective practice (Murphy & Scantlebury, in press). However, additional work is needed in order to fully understand the potential and limitations of the model, as well as to further develop understanding of the learning that occurs within coteaching experiences. Below, I make suggestions for future directions for research on coteaching. I begin by discussing future directions for research on coteaching in national and international contexts. Then I address specific extensions of the research presented in this dissertation and on the cohort model utilized at State University.

Wideen, Mayer-Smith, and Moon (1998) and Clift and Brady (2005) have both noted the need for longitudinal studies that examine preservice teacher education programs and the experiences of preservice teachers across time. The field is currently dominated by case studies of preservice teacher learning that typically examine one or two aspects of a teacher education program. Such studies do not provide insight into the long-term trajectory of professional learning and growth, or the multiple factors that impact a teacher’s learning and practice over time (Clift & Brady, 2005). Across the field of teacher education there is a need for longitudinal studies and the coordination of studies across multiple settings and universities in order to expand our understanding of “the impact of teacher education on teacher learning and teacher practices” (Zeichner, 2005, p. 740). A few longitudinal coteaching case studies have been conducted (Juck,
Scantlebury, & Gallo-Fox, in press; LaVan, 2004; Wassell, 2004) along with one cross-case analysis (Wassell & Lavan, 2009). Several edited books (Murphy & Scantlebury, in press; Roth & Tobin, 2005b), conference sessions (AERA, NARST, ASTE) and journal forums (for example, the Qualitative Research and Ethics debate in the *Forum for qualitative research* (available online at: http://www.qualitative-research.net/fqs/fqs-e/debate-3-e.htm, or *Cultural studies of science education* (2009), 4 (2)) have brought together the varied findings and differing models of coteaching studies conducted throughout the world. One of the things that has become clear through these works is that while there are many similarities among coteaching models for learning to teach that have been implemented, they can vary greatly across setting (Gallo-Fox, Juck, Scantlebury, & Wassell, 2006). There is a formal need to integrate findings of various models across settings, and to expand upon the longitudinal work that has been done to develop a stronger understanding of how coteaching experiences affect participants across time. Furthermore, coordinated multi-site studies (Zeichner, 2005) integrating the efforts of several researchers across institutions could provide further insight into coteaching experiences.

In its sixth year of implementation, 60 interns have now participated in State University’s coteaching model for learning to teach. Longitudinal work following the participants, their classroom retention, and also their teaching experiences would be valuable. Some initial longitudinal work was done following the first teaching cohort through their first year in the classroom (Juck, Scantlebury, & Gallo-Fox, in press). Additional follow-up is necessary to understand the new teachers’ current practice and
the ways that the coteaching experiences may, or may not, have impacted their classroom practice and work with colleagues. Following the first year cohort forward into their fifth year of classroom teaching would provide insight into the experiences of these early career classroom teachers. Similar work with Cohort II, the focus of this dissertation, would also be valuable particularly as there is a rich understanding of their full practicum experiences and perspectives of practice. These teachers are now in their fourth year of classroom practice. Additional work around the retention of participants to the field of teaching could also be helpful. Tobin and Roth (2005) reported that the participants in the coteaching model at the University of Pennsylvania remained in the field, “mostly in urban settings” at the rate of 90 percent (p. 320). This is an unusually high rate of retention for any teacher education program, made more unusual by the fact that these teachers worked predominantly in urban settings. It would be valuable to learn the retention rates of participants in other coteaching models and to develop a stronger understanding of the role that coteaching may or may not have played in this.

As was stated in the opening of chapter of this dissertation, the standards reform and accountability reform efforts have brought increased attention on student learning. Such emphasis is reflected in the current attention to linking teacher practice and student learning, or outcomes, as an important part of any study (Cochran-Smith & Zeichner, 2005). The research developed within this particular study is framed specifically around the interactions of the coteachers and the ways that their practice supported becoming a professional secondary science teacher (identity development) within this community of practice. As with any research project, there was a need to delineate the boundaries of
study. While students were critical to the community’s work and effectively the reason that the teachers were gathered in these classrooms, a research design decision was made to center this study on the ongoing coteacher-to-coteacher interactions that shaped the coteachers’ work and learning opportunities. Additionally, it was recognized that the spaces outside of instruction formed a critical place for teaching and learning within the community. The decision to examine these spaces expands the focus of the typical research study on learning to teach in the field practicum and provides insight into the learning experiences of teachers afforded across the workday.

As stated, students were a central focus of the work of the community of practice and an important part of the Discourse (Gee, 1992, 1996) of the community for this study. A decision was made however, not to develop work around the many different Discourses of practice developed by the interns throughout their work in the coteaching community of practice (this is further discussed below). One area that remains to be developed is analysis around the ways that the coteachers talked about and thought about their work with students. This is an area that is rich for development and a natural extension for future work with this data set. Two studies on coteaching have looked at the impact of coteaching models on student learning. Bacharach, Heck, and Dahlberg (in press) found that coteaching had a significant impact on the standardized state test scores in both reading and mathematics of K-6 students who had coteaching student teachers over those who had traditional student teachers. Another research study examined the impact of coteaching in a different way (Murphy & Beggs, 2006; Murphy, Beggs, Carlisle, & Greenwood, 2004)—in the past elementary teachers did not receive
instruction around teaching science as part of their teacher education program (Murphy, personal communication). Reform efforts in Northern Ireland have been working to incorporate science education into a regular part of the curriculum. Using coteaching, Murphy and Beggs have been placing preservice science specialist teachers with classroom teachers for pre-practicum experiences to foster the learning and teaching of science in elementary classroom. Follow-up research shows that students who participated in cotaught science instruction have significantly higher positive attitudes towards science relative to students in the same schools than those who did not receive cotaught science instruction. These attitudes persist even six months after the interns leave the classroom setting. These two studies both examine the impacts of coteaching on student learning in very different ways. Furthermore, numerous research studies on coteaching report that cooperating teachers believe that the increased numbers of teachers in the classroom strengthens student instruction. However, additional research is necessary to examine actual instructional practices in cotaught classrooms. Prompted by this dissertation, a future study will utilize participant interviews and the video-data collected to examine teacher classroom practice and coteaching pedagogy. Initial analysis of the interviews will be conducted to determine the ways that participants believe their teaching of students is enhanced through coteaching. Analysis of the data will examine cotaught and solo taught lessons to see if there is indeed a difference in instruction between these contexts. Studying teacher practices across structural teaching models within State University’s coteaching model may provide insight into differences in
teacher practice across settings, as well as insight into how student contact time and learning can be impacted by coteaching structures.

In her analytic framework for studying development within sociocultural experiences, Rogoff (1995) proposes looking at the community, interpersonal, and personal plans of development. Given the large scope of this current study, a decision was made not to conduct analysis at the personal plane—which is the level most typically studied and presented in the research literature on student teaching. Historically, there has been debate about the development of identity within sociocultural models of learning. Specifically, the literature contains debates regarding whether or not one’s identity can reflect individual differences and belief structures, or if identity reflects the collective experience. Much of the work in this area argues that all identities are socioculturally bound and reflect the collective experience and cultural Discourse. However, within the past ten years new work around teacher identity has promoted the notion of multiple identities and the notion of core identity, or self (Rodgers & Scott, 2008). Data from this study suggest that while the intern’s beliefs about practice clearly do reflect the collective experience in many ways, they also reflect personal differences and experiences with teaching and learning prior to their work at Biden High School. Part of this, however, may also reflect the sociocultural context that highly valued the teacher as individual and one’s own personal style of practice. Clearly, there is a significant amount analytic work to be done in regarding this issue. Such analysis will add to the current debate about identity and sociocultural learning experiences and offer additional insight around the intern’s experiences and professional identity development within the coteaching model.
Another extension of this current study relates specifically to individual growth and development within the coteaching experience. Initial coding of the data identified numerous codes about the interns’ development of the Discourse (Gee 1992, 1996) of the community of practice and reflected their growing identities as professional members of the teaching community. Following the interns over time through the ethnographic data reveals shifts in the ways that they participated in the community practices, the ways that they conducted themselves in the classrooms, and in the ways that they interacted with colleagues. Furthermore, these data illustrate their shifting confidence and growing sense of themselves as teaching professionals. Research synthesis since the 1990s have argued that the student teaching experience is often cited by practitioners as the most valuable part of their teacher education programs (Feiman-Nemser & Buchmann, 1985, 1987; Guyton & McIntyre, 1990; McIntyre, Byrd, & Foxx, 1996), however, as these reviews have also argued teacher educators do not thoroughly understand what is learned during this time period and have problematized the traditional practicum experience. Research into the interns’ Discourse development is valuable because, it will help address gaps in the full practicum literature about the nature of learning within field experiences and will illustrate how this rite of passage can provide beginning teachers with the opportunity to develop a sense of membership and belonging within the professional teaching community.

Two additional areas of interest were uncovered but considered outside the scope of this dissertation. These areas of future intent include coteacher discourse in in-situ huddles and study of the value of the cohort peer learning experience. I will briefly
explain each of these research extensions and their potential value to the field. Discourse analysis of \textit{in-situ} exchanges will help develop understanding of the on-going shift of practice in practice and the complexities of practice addressed as an ongoing part of coteaching. This analysis will be helpful because it will support understanding of the interns’ growing understanding of practice, and the questions that they learned to solve and reflect upon as they worked in the classroom. Furthermore, it will develop needed understanding of teacher thinking processes that occur in the field, support better understanding of the teacher decision-making process, and support the role of students in these efforts. In regard to issues of preservice teacher peer learning, research literature has noted that preservice teachers view peer support as a valuable part of their learning experience (Bullough et al., 2002; Gardiner & Robinson, 2008; Seifert & Mandzuk, 2006). While intern interviews also support these findings, data suggest that interns played a larger role than just “social and emotional support” (Seifert & Mandzuk, 2006) in the reflective practice and in the learning that occurred within the coteaching model. For example, as discussed in this dissertation, interns reported having learned from their peers and debated about the meaning of their work. Furthermore, those interns who carpooled all emphasized the importance of carpool discussions as a valuable part of their full practicum experience. Gardiner and Robinson (2008) in their study of paired pre-practicum placements also noted that paired preservice teachers highly valued their time to interact with their teaching partners and worked to create time when they could talk about their practice. Future analyses of peer interactions, participant perceptions of peer learning experiences, and recordings of carpool experiences would provide opportunity to
develop further understanding about the value of peers within coteaching cohort learning experiences.

Finally, ongoing work is being conducted around the cooperating teachers professional learning through participation within the model (Gallo-Fox, Wassell, & Scantlebury, Submitted). Initial research examined the perceptions of the cooperating teachers as reported in interviews during their first two years of involvement in the study. It would be helpful to extend this current work by drawing in the field data and video data to examine the cooperating teachers pedagogical practices across time. Noticeable differences existed between cooperating teachers’ practice in the first and second years of the study (Fieldnotes, 2004, 2005). In future work it will be valuable to analyze video data to develop a stronger understanding of how the cooperating teachers’ practice may, or may not have been impacted by their experiences working with the model, and how earlier experiences working with interns impacted later work with interns and students.

In conclusion, coteaching shows great promise for creating new ways to support the learning of preservice and inservice teachers. The experiences of the interns at Biden High illustrate the potential of the structures of the cohort coteaching model to help address some of the dilemmas associated with of traditional student teaching models. By enabling interns to work with multiple coteachers, the coteaching model helps to break down the idiosyncratic nature of traditional coteaching models, and provides interns with the opportunity to learn alongside others in a dynamic arena that supports collective interactions in and about practice. Such structures helped to challenge the isolated nature of practice, open up the complexities and uncertainties of teaching, and foster a sense of
collegiality and problem-solving among group members. This dissertation has also opened up a series of new questions for future research on the coteaching model.
References:


Miles, M. B., & Huberman, M. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.): SAGE.


APPENDIX A: INTERVIEW PROTOCOLS
Intern interview I

Post Science Methods Course: Interview topics/questions
Big Ideas: Experience planning curriculum unit; doing micro-teaching; school visits; thoughts @ cotchg

Curriculum Unit - Planning:
How's it going? What do they think of the process? Describe the experience
Decisions @ planning, group dynamics
What do you think you've gotten out of this experience?
If you had done the unit planning alone, do you think that that would have been different than the fact that you did it with a group?

Micro-teaching:
How do you think this went?
Can you tell me about how you went about picking a topic and planning with your partner?
If you could do it over again, what would you change?
What do you think you've gotten out of this experience?
Anything that you learned for future co-teaching?
How would you compare your solo teaching vs. microteaching experiences?

School Visits: On-site Experiences Observations:
Can you think of one of your visits and describe what went on?
What would you say your typical role has been in these different classes?
Have you done anything that has resembled co-teaching?

Perceptions about co-teaching:
Could you describe what you think co-teaching looks like when it's working well?
So what do you think about this idea of co-teaching?
What other thoughts/ ideas do you have about co-teaching?
*Do they feel that Kate & Sue modeled coteaching for them?
Concerns or questions about co-teaching:
Other:
Do you have anything else that you'd like to add about your experiences with co-teaching or planning that we didn't get to talk about?
Intern interview II – March 2005
March ’05 Intern Interviews

So how's it going? (Touch on both co's & solos)
The good, the bad & ugly - Best / worst experience so far
Have there been any surprises?

Working relationships & Sense of community
• How would you characterize your teaching relationships with each of your
coteachers?
• Which co-op/interns do you most/least identify with?
(Routines, teaching styles, management, etc)
• Do you find that different coteachers influence your practice/ideas about teaching?
  Please explain.
What do they bring to coteaching that you may not have tried out on your own?
Do you ever find yourself teaching in ways things that you might/might not
embrace?
• Follow up on role of peers (other interns) on their learning
• Is there any one else in the program or schools who you do not coteach with that
impacts your practice & how you think about teaching?

Respect
Do you feel that there's a sense of co-respect among your coteachers? Please explain.

Sharing work
• How would you characterize the division of responsibility for teaching amongst
your
coteachers? (Re: planning, instruction, classroom management)
• Do you feel like you have, or are developing, a voice in coteaching?
If they haven't assumed equal responsibility for classroom activities & management-
Why?

Co-planning
• How's co-planning going?
If co-plan for more than one class, compare different experiences
• What type of things do you learn when co-planning?
• How comfortable are you with the group dynamics?
• In what ways have you contributed to the group discussion and lesson planning?
• Do you feel that your voice is heard?
• If not addressed already:
  • Do you feel that the workload is being shared equally between the coteachers
  when you are planning and in the lessons that follow? Is there anything that you
  would like to change about your co-planning meetings? How might you go about
  making these changes if such a thing is possible?

Solo vs. Coteaching
• Can you talk a little bit about the similarities/differences between your teaching in
these different types of structures?
• Do you find that there's any carry over/transfer from one to another? Please explain.
• What do you see as the value of solo teaching? Of coteaching?
• Is there anything that you feel you are missing out on because you are doing
coteaching
and not just regular student teaching all day?

**What are they learning about teaching**
Get them to talk about what they are learning about (with examples)
- their teaching (practice)
- the running of classrooms
- students
- different courses: tracks and content
- teaching in vs. out of content area
- how schools are organized and run
- structures of work day, school schedules, interruptions (snow days, assemblies, unexpected things); discipline
- working with parents
- working with colleagues and other teachers

**Thoughts about future teaching:**
**Short term**
- Do you have any specific goals for the semester?
**Long term**
- Are their things from your current experiences that you think you may want to try to bring into your own classroom?
  - If you were asked at a job interview:
    - How would you explain what your ideal classroom might look like/contain/be structured?
    - How would you describe your practice/what type of teacher you will be?

**Conclusion:** Is there anything else that you would like to add?
Intern Interview III – Close out interview, May 2005

**Icebreaking:**
So what was the best part of the semester? The worst part? Coteaching specific? Any surprises?

**Reflecting on the Semester:**
In what ways do you think that you grew as a teacher?
- What part of the experience was the most valuable to you?

What do you believe a person should get out of their student teaching experience? Do you think that this can be accomplished during coteaching?

Get a sense of a typical teaching day/schedule:
- Generally how much time would you say you spent at your school? Arrival, departure.
- Did you spend time working at home? Generally how much? Doing what?

Explore notion of coteaching as a support for learning about teaching:
- In what ways did the coteaching support your learning?
- Teaching lessons multiple times- How is this valuable? Carryover from one class to the next? How does this occur?
- Saw people spending time watching lead, how is this good, bad - what was occurring?
- Did you ever find yourself making adjustments in the middle of lessons (solo or coteaching, or from one lesson to the next) How did that happen? What about when coteaching? (What did this look like?)

**Community**
Sense of community between the teachers that you worked with the department?
- How did this impact your work & what you were able to do & learn?
- As you think about your practice, what ways have your different coteachers impacted the type of teacher you are & want to be?
- What do you see as the differences/similarities between working with other interns and cooperating teachers?

How comfortable were you with the group dynamics?
- Do you feel that the workload was shared equally between the coteachers when you planned, taught, did other teaching related work? Were you comfortable with how things worked out?
- Do you feel that your voice was heard within your different coteaching situations?

**Teacher talk - role in practice/semester**
When would you say you were most likely to talk about your practice, lessons, teaching? What did this look like/sound like? (Example?)
- How often were you able to debrief on a lesson? What did this look like?
- Informal settings: Carpooling & Lunch - roles that these played in practice & sense of what it means to be a teacher
- People resources - In what ways did you use each other as resources? Did you talk with others across the content areas? How about when teaching out of content area?
Planning
- How would you describe the role of the coplanning in your practice? In what ways did it shape the teaching that occurred? In what ways didn't it?
- When you have your own classroom how do you think you will approach planning?

Perceptions/Understanding of teaching:
Try to get them to link current understandings back to coteaching experience when applicable.
- Is your current view about teaching any different from before you started your coteaching experience?
- Thoughts about how students learn?
- Thoughts about their own teaching style - So how do you describe yourself as a teacher? (Job interview)
- In what ways do you think that your experiences this semester are going to affect your work in your own classroom?

Thoughts about future practice:
- Are their things from your current experiences that you think you may want to try to bring into your own classroom?
- How do you think you'll do next year?

Programatic questions:
- What do you see as advantages/ disadvantages of the coteaching model?
- When is coteaching a good learning experience? When and how can it inhibit your learning about teaching? Can it become a crutch? How?
- How has your understanding of what coteaching looks like changed since you started coteaching?
- Do you feel that you missed out on anything because of coteaching?
- What can we do to make coteaching better?
- Supervisor: Experience with? Learning from?

Wrap up:
- Any issues or concerns that they had during the semester that I should know about?
- Anything else that you want to talk about?
Cooperating Teacher Interview I – March 2005

The main purpose of this conversation is to talk about your experiences working with the student interns.

• How have things been going so far this semester?

• What do you see as the purpose of student teaching? (If didn’t address in previous year)
• Is there anything that you feel the students are missing out on because they are coteaching and not only soloing?

How are the interns doing?
• Assessment on how things have been going over the semester? By Intern
  Ask them to talk about the different interns - rapport & how things are going…
  Are they stepping up - responsibility, authority
  Issues @ respect - between teachers/ students
  What do you think s/he has learned so far this semester?
  What goals do you have for them for the rest of the semester?
  How will you help them work on these?

Coplanning
  How have you been approaching coplanning?
  How's it been going? (Nature of meetings)
  What types of things do you feel the interns gain from these experiences?
  You?

Impact?
• Do you feel that working with the interns has enhanced your own understanding-way you think about/approach teaching & planning in any way? (Issues of growth, reflection, professional learning)
• Tried out any new activities, labs…?
  If you did co-teaching last year, have you used those things again?

Conclusion
• Do you have any additional comments or things that you would like to add?
Cooperating teacher interview II – Close out interview, June 2005

Purpose: To talk about their experiences working with the teaching interns over the past Semester

How do you think that things went this semester?
Good? Bad? Examples
Surprises? (This year as compared to last year?)
Coplanning?
Group dynamics?
Stepping up/sharing - responsibility, authority, space, voice
Any pivotal moments?

Intern specific information
Thoughts about how s/he did
In what ways do you think that s/he grew over the semester?

Did you get anything out of this experience? Value? Try anything new?
Anything that they might carry over into next year? Anything from last year…

Programmatic questions:
How can we make this experience a better one for interns? Coops?
Anything that we could have done to have made you more comfortable or prepared for coteaching?
When we work to get things set up for next year, what type of advice or information would you give the new coops?

Conclusion:
Any other issues or concerns from the semester that I should know about?
Any additional comments or things that you would like to add?
APPENDIX B: INTERN TEACHING SCHEDULES

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APPENDIX C: APPROVED CONSENT FORMS
INTERNS

STATE UNIVERSITY
ASSENT TO ACT AS A PARTICIPANT IN AN INVESTIGATIONAL STUDY

Title of the Study: Co-teaching as a model for secondary science student teaching.

Researchers: xxxxx xxxxxx and Jennifer Gallo-Fox

Description of the Study: You are being asked to participate in this research study because you have enrolled in [course] and will be co-teaching during the 2004-2005 academic year. The purpose of this study is to gain an understanding of the viability of co-teaching as a student teaching model. During this study, you will be audio taped or videotaped and you may be asked to take part in interviews or respond in writing to questions related to the study.

Risks: There are no potentially harmful risks related to participating in this study.

Benefits: As a result of participation, your own awareness about teaching, learning, high schools, and communication may be increased. The study will provide the university and the field of teacher education with valuable insight into alternative models for student teaching.

Confidentiality: All information collected in this study will be kept private and you will not be identified by name. The audio and videotapes from this study will be kept by the researchers in a locked filing cabinet. Only the researchers will have access to these tapes and they will be destroyed by August 31, 2007.

Disclaimer/Withdrawal: Your participation is completely voluntary and you may withdraw at any time without prejudicing your standing at State University or in [course]. Withdrawal does not excuse you from participation in co-teaching experiences. However, if you choose not to participate you will not be videotaped or interviewed and no references to your experiences will be made in the reporting of this study.

If you have additional questions or concerns about the rights of individuals who agree to participate in research, feel free to contact Dr. XXXX XXXXX, Vice Provost for Research at State University. Phone: xxx-xxx-xxxx

Voluntary Assent: I have read this form. Any questions I have concerning this study and my participation have been answered. I agree to participate in this research study.

__________________________    ____________________________    ___________
Name of Participant                  Signature of Participant        Date/Time
STATE UNIVERSITY
ASSENT TO ACT AS A PARTICIPANT IN AN INVESTIGATIONAL STUDY

Title of the Study: Co-teaching as a model for secondary science student teaching.

Researchers: XXXX XXXXXX and Jennifer Gallo-Fox

Description of the Study: You are being asked to participate in this research study because you will be working with undergraduate preservice science teachers from State University who will be co-teaching in your classroom during the 2004-2005 academic year. The purpose of this study is to gain an understanding of the viability of co-teaching as a student teaching model. During this study, you will be audio taped or videotaped and you may be asked to take part in interviews or respond in writing to questions related to the study.

Risks: There are no potentially harmful risks related to participating in this study.

Benefits: As a result of participation, your own awareness about the teaching and learning of high school students and preservice teachers may be increased. The study will provide the university and the field of teacher education with valuable insight into alternative models for student teaching.

Confidentiality: All information collected in this study will be kept private and you will not be identified by name. The audio and videotapes from this study will be kept by the researchers in a locked filing cabinet. Only the researchers will have access to these tapes and they will destroyed by August 31, 2007.

Disclaimer/Withdrawal: Your participation is completely voluntary and you may withdraw at any time without prejudicing your relationship with State University; or within your school district, high school or science department. Should you choose not to participate, undergraduate students may still co-teach in your classroom. However, you will not be videotaped or interviewed and no references to your experiences will be made in the reporting of this study.

If you have additional questions or concerns about the rights of individuals who agree to participate in research, feel free to contact Dr. XXXX XXXXX, Vice Provost for Research at State University. Phone: XXX-XXX-XXXX

Voluntary Assent: I have read this form. Any questions I have concerning this study and my participation have been answered. I agree to participate in this research study.

__________________________ ____________________________    ___________
Name of Participant Signature of Participant Date/Time