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THE COMPETING PEDAGOGIES OF SCHOOLS AND
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JEFFREY J. ROZELLE

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By

Jeffrey J. Rozelle

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ABSTRACT

BECOMING A SCIENCE TEACHER:
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By

Jeffrey J. Rozelle

A culminating student teaching or internship experience is a central component of nearly every teacher education program and has been for most of teacher education's history. New teachers cite field experience and student teaching as the most beneficial, authentic, or practical aspect of teacher education. Teacher educators, however, have cause to view student teaching skeptically; student teachers often move away from the reform-minded practices espoused in teacher education.

This multi-site ethnographic study investigated a full-year internship experience for six science interns at three diverse high schools as part of a teacher preparation program at a large state university. In taking an ecological perspective, this study documented the dynamic and evolving relationships between interns, cooperating teachers, teacher educators, and the school and classroom contexts. The goals of the study were to describe the changes in interns throughout the course of a year-long internship as a science teacher and to determine the relative influences of the various aspects of the ecology on interns. Data include fieldnotes from 311 hours of participant observation, 38 interviews with interns, cooperating teachers, and teacher educators, and 190 documents including course assignments, evaluations, and reflective journals.

Interns' teaching practices were strongly influenced by their cooperating teachers. During the first two months, all six interns "used their mentor's script." When teaching, they attempted to re-enact lessons they witnessed their cooperating teachers

enact earlier in the day. This included following the lesson structure, but also borrowing physical mannerisms, representations, anecdotes, and jokes. When interns could no longer follow their cooperating teacher due to an increased teaching load, they "followed their mentors' patterns"—implementing instruction that emphasized similar strategies—regardless of whether they were experiencing success in the classroom or not.

To explore this disproportionate influence, this study documented the differences between the school-based placements and teacher education. Three contrasts were described. First, in schools, interns received support and assistance in real-time from cooperating teachers as they taught, while in teacher education, interns received support in planning for and reflecting on instruction. Second, in schools, interns and cooperating teachers' work had a task-orientation in which they solved concrete and contextualized problems together, while teacher educators were oriented toward ideas about teaching that might be generalized beyond the immediate context of the intern. Finally, in schools, interns acted like teachers. This meant dressing like a teacher, learning to use their bodies and voice in authoritative ways, and managing the physical space of the classroom. In teacher education classrooms, interns returned to talk and learn about teaching but reacquired the persona of students in their dress, movements, and social interactions.

This study confirms the literature's consistent finding about the importance of cooperating teacher in the development of a student teacher's practices. In describing the worlds of the school and teacher education, it suggests reasons why the field experience acts as an influential "pedagogy of enactment" (Grossman, Hammerness, & McDonald, 2009) and discusses the implications for teacher education pedagogy.

ACKNOWLEDGMENTS

I am forever indebted to the six interns who graciously allowed me to join them as they began the process of "becoming a science teacher." You allowed me access to your professional lives, warts and all, in ways that counter the descriptions of teaching as a privatized practice. You were generous with your time, even in a year in which time was at a premium. You were honest and vulnerable, even when that honesty and vulnerability might expose what a struggle learning to teach can be. You were always kind and welcoming, giving me far more than I could have ever returned. I hope your stories told here honor your commitment to my work and to teaching.

Likewise, I appreciate the cooperating teachers, field instructors, and course instructors who allowed me to document the hard and uncertain work of supporting interns. To the cooperating teachers, allowing an intern into one's classroom is disruptive enough; having me tag along even more so. But I always felt welcome in your classrooms. To the teacher educators, you pushed interns to consider a professional practice that was open for inspection and analysis; you walked the talk in allowing me such open access to your own supervision and teaching. Thank you.

My time in graduate school and my work on this dissertation were so much richer because of my work on the *Entering the Guild* project. Jamie Mikeska tolerated my office mess, managed to stay patient with my travel neuroses, sparred with me over ideas in ways that define what graduate school should be about, and made me laugh in ways I will never forget. More than that, Jamie, you are the dearest of friends and a most valued colleague. Jodie Galosy, our project director, gave me such consistently good advice,

challenged my thinking patiently, encouraged me to be ambitious, and put up with Jamie and my antics. Jodie, from the day I met you, I trusted your wisdom and character entirely and have never been let down.

It is impossible to overstate the influence of Suzanne Wilson on this work, my thinking, and my life. Whatever intellectual growth I have made, whatever strengths this dissertation has, are a result of Suzanne's patient, kind, and generous advising. Suzanne, you are the finest of teachers, the finest of mentors, somehow capable of using your powerful intellect not to force ideas on your students, but to help your students find their own ideas. It is a precious gift you give to your students. Much like the "reproducers" in this study, I will spend my career striving to emulate you.

Finally, I must acknowledge the sacrifices that my family has made and the support they have provided for this dissertation. Molly and Anna, my precious girls, have tolerated Saturday mornings with Dad rushing off to write, evenings where my mind was on the data, and moves from homes, friends, and schools they loved for my work. Despite that, they have continued to grow into the most lovely of girls. Molly, you inspire me with your perseverance, your courage, and your loyalty. Anna, you inspire me with your enthusiasm, your gumption, and your confidence. My life is richer and I am a better person because you are my daughters. Tiffany, the love of my life, believed in me, and always has, much beyond anything I deserve. No one should have had to give so many baths, do so many loads of laundry, listen to so many stories, transcribe so many interviews, critique so many ideas, edit so many chapters, and do so much for our girls on your own. I could not have done this without you. I would not have wanted to.

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The importance of student teaching —and field experiences more generally —for new teachers goes almost unchallenged. A culminating student teaching or internship experience is a central component of nearly every teacher education program and has been for most of teacher education's history (Guyton & McIntyre, 1990). Although recent reforms of teacher education have called for changing field experience in different ways (Holmes Group, 1986; Lanier & Little, 1986; Levine, 2006), no one doubts the central place of teacher learning *in* schools and classrooms; even the harshest critics of teacher education almost always promote on-the-job or in-the-field training (e.g., Hess, 2001). New teachers reinforce this message, often citing field experience and student teaching as the most beneficial, authentic, or practical aspect of teacher education (Adams & Krockover, 1997; Britzman, 1991; Farkas, Johnson, & Foleno, 2000; Goodlad, 1990). Given its centrality, then, it is surprising that field experiences in university-based teacher education programs —as sites for teacher learning —are not well understood, for a variety of reasons which I elaborate below.

I begin this chapter by examining what we know about field experiences and student teaching based on research, the limitations of this knowledge base, and how this study might inform the literature. I then describe the study's theoretical framework by considering two questions: In what environments are interns immersed? What changes (if any) do interns undergo as they move through the year?

Overview

My intent is to provide a holistic analysis of the internship experience for preservice science teachers. It is holistic in two senses. First, I keep track of the

"ecology" of the experience for a group of interns (student teachers who spend an entire year in one school as part of their teacher preparation) (Zeichner, 1986). Rather than focus on one aspect of field experiences (for example, the influence of cooperating teachers), I include in analysis the entire professional life of interns, documenting interns' interaction with various influences and people. This includes —prominently —the cooperating teacher, but also the university supervisor, the school and classroom context, and teacher education coursework, all of which have been cited by various researchers as potentially influential on student teachers and/or new teachers.

The second sense in which this study will be holistic is in its view of the changes that may occur in interns throughout the year. Using Korthagen's (2004) conception of the levels of change within teachers, I will describe and explain changes in interns' *behaviors* and *competencies*, which are more readily observable, but also look for changes in less observable, though theoretically important, levels of teachers like *beliefs*, *professional identity*, and *mission.* Given this emphasis on capturing a holistic description and analysis, I conducted an ethnography of the science interns' experience in which I attempt to construct "descriptions of total phenomena within their various contexts and to generate from these descriptions the complex interrelationships of causes and consequences" that exist during their internship (LeCompte & Preissle, 1993, p. 3). My central research goals were:

- To describe the changes in interns, if any, throughout the course of a year-long internship as a science teacher and explain why those changes occur.
- To determine the relative influences of the various aspects of that ecology on the different levels of change.

In sum, I sought to understand the experiences of interns holistically by documenting the array of forces at play that may influence these new teachers.

Review of Literature

While we have limited knowledge about teacher learning from field experiences in schools, it is not for lack of interest on the part of researchers. However, literature reviews cite common problems with the research on field experiences (Clift & Brady, 2005; Guyton & McIntyre, 1990; McIntyre, Byrd, & Fozz, 1996; Wilson, Floden, & Ferrini-Mundy, 2001). The literature is dominated with descriptions rather than analyses; the evidence for claims concerning the effects of such experiences is uneven or weak. While these reports may assist teacher education practitioners, attributing effects to particular innovations can be difficult (Wilson, Floden, & Ferrini-Mundy, 2001).

Further, more quantitative studies use pre- and posttest designs in which teachers are assessed —along dimensions of perspective, orientation, or efficacy —prior to entering the field and then again at the end of their field experience (e.g., A. W. Hoy & Spero, 2005; W. K. Hoy & Woolfolk, 1990). Studies like these report the "effects" of student teaching on various outcomes, but offer limited insight into the mechanisms behind those changes (Zeichner, 1986). Rarely have researchers systematically compared different field experiences (either across programs or school sites) (Clift & Brady, 2005), though important exceptions exist (Lacey, 1977; Tabachnick & Zeichner, 1984). Additionally, relatively little work has been done that takes account of disciplinary backgrounds in the field experience (Clift & Brady, 2005); that is, little research examines the effects of field experience in learning to teach mathematics or science or literacy. This may be most true for the work in science education where, for example,

"little effort has been made to understand the contributions of cooperating teachers and teacher educators" to student teachers' learning in and from the field (Clift & Brady, 2005, p. 322).

In sum, pinpointing and isolating the effects of the student teaching experience has proved elusive (Clift & Brady, 2005). Different results occur across different teachers and programs, and this has led to consistent calls for a more richly theorized conception of field experiences (Clift & Brady, 2005; Guyton & McIntyre, 1990; Wideen, Mayer-Smith, & Moon, 1998) and for research that empirically documents learning in the field and over time (Clift & Brady, 2005; Zeichner & Gore, 1990).

This study targets several of these weaknesses in the literature. First, data were collected continuously throughout the year, allowing for an analysis that documents a trajectory of teacher learning and socialization over time. In this way, it opens the "black box," documenting (perhaps) the mechanisms at play in "field experience," even as it looks at effects of the experience over the year. Second, the interns are all science teachers in a teacher education program that emphasizes a disciplinary perspective. In this way, the study speaks to the particular concerns that come with becoming a science teacher.

However, despite the limitations of the research, there are several key findings that inform this study. I begin with research on the effects of field experiences on prospective teachers.

Effects of Student Teaching on Student Teachers

In general, researchers have found that the student teaching experience, along with the first few years of teaching, tend to move teachers toward a more authoritative

stance toward their students (W. K. Hoy & Rees, 1977; Veenman, 1984). For example, W. K. Hoy and Woolfolk (1990) surveyed 191 undergraduates at the beginning and end of a semester using an instrument designed for assessing the tendency of teachers to desire control of their students. The group of undergraduates who student taught (n=54) grew significantly more custodial in their attitudes over the semester compared to the group of education majors who had not yet student taught (n=63) and the group of psychology majors who were not necessarily planning on becoming teachers (n=65). Through surveys of preservice teachers, Lacey (1977) found that science teachers were more likely to have this custodial attitude than those in other disciplines, though he attributed this not to the effects of student teaching, but to differences in the type of people drawn to the various disciplines.

A second related effect of student teaching is that teachers tend toward more traditional styles of teaching and away from the reform-minded methods and strategies espoused in teacher education. Traditional teaching might manage students in more custodial ways but, more broadly, might also include a dependence on teacher-centered pedagogy (rather than student-centered) and treating the teaching/learning process as one of knowledge transmission from teacher to students (rather than construction of knowledge by students with assistance of teachers). In the heat of the moment, student teachers resort to following their "apprenticeship of observation" (Lortie, 2002), bend toward their cooperating teachers' traditional style or influence (Hewson, Tabachnick, Zeichner, & Lemberger, 1999; Ross, 1988), are too consumed by the demands of curriculum and classroom management to implement their reform ideals (Moore, 2003; Powell, 1994, 1997; Tang, 2003), or fail to translate the theory of teacher education into

practice (Graham, 1997; Korthagen & Kessels, 1999). For example, in Graham (1997), one student teacher, Michael, held deep commitments fostered at the university toward student-centered instruction in which students played active roles in their learning and was placed in a cooperating teacher's classroom who shared some similar commitments. However, when Michael felt uncomfortable interacting socially with his students, he reverted to a traditional lecture-based teaching style that minimized awkward communication between him and his students, a style similar to the one he experienced as a student growing up in elite, private schools. Similarly, Hewson, Tabachnick, Zeichner, and Lemberger (1999) found their efforts for reform-based teacher education thwarted when student teachers entered classrooms with mentoring teachers where they rarely saw efforts at conceptual change teaching by their mentor and were offered little practical support in attempts to implement it themselves. An important exception to this study is Tabachnick and Zeichner (1984) who found that student teachers' perspectives on teaching did not change throughout the student teaching experience, but rather "solidified" or deepened.

Third, many student teachers undergo what some have called "praxis shock" (Kelchtermans & Ballet, 2002; Veenman, 1984) or "shattered images" (Cole & Knowles, 1993a) in which their conceptions or visions of the teaching profession, or the act of teaching, or their own persona as a teacher radically change. For some teachers, school is disturbingly different from what they remembered as students (Graham, 1999), while others are disillusioned at how different teaching, their mentor teacher, and students are from what was described in teacher education coursework (Britzman, 1991; Bruckerhoff & Carlson, 1995; Cole & Knowles, 1993a). Cole and Knowles (1993a) document student

teachers who describe being "misled" by their assumptions of school based on their experience as students (p. 462), as well as teachers whose experiences with lazy, uncreative cooperating teachers and catty, unprofessional school cultures "shattered" their lofty images of teachers and left them doubting their desire to teach.

In sum, research on the effects of student teaching suggests that immersion in schools leads new teachers to become more educationally conservative, to replicate both the status quo and their experiences as learners, and to be unnerved by the clash between their ideals and the realities of schooling.

Important Aspects of the Intern Experience

Another domain of relevant literature concerns variations in the field experiences that new teachers have. While we tend to talk about field experience or student teaching as monolithic, the time that different new teachers spend in schools may be wide-ranging. They witness different teaching styles, engage in a range of relationships, and have opportunities to participate in a variety of events and practices, each of which interacts with their own previous experiences in classrooms in potentially varied ways. Here too the research findings are limited for reasons noted above, but serve to direct this study toward some of the influences on the intern experience. These four influences include the cooperating teacher, university supervisor, the classroom and/or school context, and teacher education coursework. Below, I will describe the findings around each of these, beginning with the most prominent influence, the cooperating teacher.

Cooperating teachers. Cooperating teachers or school-based mentors are influential in teacher development (Wilson, Floden, & Ferrini-Mundy, 2002), although their influence is not uniformly positive or negative. For example, Winitzky, Stoddart,

and O'Keefe (1992) describe early efforts at developing professional practice school relationships between colleges of education and K-12 schools. They document instances of student teachers who were taught to use conceptual change methods of science teaching in their university methods courses, but placed with cooperating teachers who predominantly use didactic methods. The student teachers, when faced with this conflict, invariably conformed to their cooperating teachers' expectations, though the reasons for this conformity are not made clear. Likewise, researchers at the University of Wisconsin-Madison published a set of papers focused on a teacher education program that promoted conceptual change science teaching (Hewson, Tabachnick, Zeichner, Blomker, Meyer, Lemberger, et al., 1999). At both the elementary and secondary levels, they found that pre-service teachers were influenced by their methods courses and an action research seminar toward the conceptions of teaching that the teacher educators desired, at least in the way the student teachers responded in interviews and coursework (Lemberger, Hewson, & Park, 1999; Meyer, Tabachnick, Hewson, Lemberger, & Park, 1999; Tabachnick & Zeichner, 1999). Yet, these student teachers rarely attempted instruction that matched these reform-minded conceptions. One reason for this mismatch, the researchers argue, is that "cooperating teachers rarely modeled the kind of teaching (the teacher educators) were seeking to encourage" and, consequently, student teachers adopted many of their mentors' approaches (Hewson, Tabachnick, Zeichner, & Lemberger, 1999, p. 381). More positively, Graham (1999) describes a mentor teacher committed to student-centered writing instruction who is able to strongly influence a student teacher who enters with teacher-centered tendencies, and Mewborn (2000) describes an expert elementary mathematics mentor whose reflective practice greatly

increased the reflective capabilities of the student teachers with whom she worked. These findings suggest that cooperating teachers exert a considerable influence on the ways that student teachers teach and think.

Given the reported importance of cooperating teachers on teacher development, a major emphasis of this study involved documenting the cooperating teacher-intern relationship. Because the literature suggests that cooperating teachers tend to pull student teachers toward their perspective, I attempted to uncover those perspectives through interviews and participant observations. In addition, I documented the interaction between the cooperating teachers and student teachers in order to attempt to uncover the mechanism responsible for the influence. My efforts entail characterizing the multiple perspectives that interns encounter, test out, and develop.

University supervisors. Another important part of the student teaching ecology is the university supervisor, who, along with the student teacher and cooperating teacher, completes the "student teaching triad" (Guyton & McIntyre, 1990). While the role of the university supervisor varies across teacher education programs, the influence of the university supervisor is considered to be less than that of the cooperating teacher on the student teacher's development. For example, Borko and Mayfield (1995) studied four middle-school math student teachers and found the university supervisors' role across all four cases dominated by paperwork (primarily lesson plans and observation forms) rather than mathematics or mathematics-related pedagogy. In general, the university supervisors expected to have little impact on student teachers and were pleased if they managed to keep their relationship with the student teachers relatively congenial.

Others have argued that, because the role of university supervisor role is often assigned to graduate students or adjunct faculty, the supervisor has little institutional power or influence and might be considered a "disenfranchised outsider" (Slick, 1998; see also Britzman (1991) and Lanier & Little (1986)). At the same time, because the university supervisor serves as the eyes, ears, and voice of the teacher education program and is such a ubiquitous component of student teaching programs, I fully documented the interaction of the intern with the university supervisor, and the interaction of the student teaching triad, when for example, they met as a group after classroom observations or during summative conferences.

Teacher education coursework. At some level, all these findings (the effects of student teaching, the varying influence of cooperating teachers and university supervisors, and the like) suggest that one major problem confronting teacher educators is the degree of separation between teacher education coursework and teaching in schools. Major calls for reform of teacher education (Holmes Group, 1986; Levine, 2006) often target the closing of this gap between schools of education and K-12 schools. As Clift and Brady (2005) argue in their review of methods courses and field experiences, student teachers often feel like they receive conflicting messages from teacher education and school placements. And even on the relatively rare occasions when alignment appears to occur, student teachers still struggle to implement the practices called for by teacher educators (Clift & Brady, 2005; Graham, 1997).

Science teacher educators fare no better. As I described previously, the University of Wisconsin-Madison's teacher education program was designed to foster conceptual change teaching (Hewson, Tabachnick, Zeichner, Blomker, et al., 1999) and they found

that their methods coursework and seminars did influence preservice teachers' beliefs and commitments (Hewson, Tabachnick, Zeichner, & Lemberger, 1999). That success, however, was tempered by student teaching experiences they felt were unaligned with the university's vision of teaching, which prevented student teachers from engaging in reform practices (Hewson, Tabachnick, Zeichner, & Lemberger, 1999). In a different study, Sadler (2006) studied 13 middle and high school science student teachers who were taking a methods course (for which Sadler was the instructor) during their student teaching experience. Using interviews, field notes of class discussions, and reflections written for class, he found that the student teachers (with only one exception) conceptualized how teaching *should be* along reform-based ideals, but had serious reservations about whether these ideals might ever be realized due to a variety of constraints including lack of resources, time limitations, curricular concerns, and their students' lack of appropriate preparation. Schools, it seems for these teachers, get in the way of the good teaching envisioned by the university. In an attempt to better understand the kind of changes student teachers undergo, capturing the interplay between the ideas and experiences that student teachers encounter at both the university and their K-12 schools is a central task of this study. As a result, I followed student teachers as they moved back to the university for weekly coursework and attempted to look for interactions between the ideas and practices advocated for in teacher education and the secondary science classroom.

School and classroom contexts. The impact of school and classroom contexts on new teacher (not student teacher) socialization has received increasing attention (e.g., Achinstein, Ogawa, & Speiglman, 2004; Flores, 2006; Flores & Day, 2006; Hebert &

Worthy, 2001; Kelchtermans & Ballet, 2002; Powell, 1997). Powell (1997) documented the degree to which a lack of classroom science resources, coupled with classroom management concerns, pushed a new science teacher toward a textbook-based teaching style even though his prior commitments indicated a desire to teach in more scientifically authentic ways. Although this second-career teacher (who had been a working scientist) brought with him a strong desire to implement realistic science with a focus on data and evidence, a lack of lab materials and an inability to maintain order when attempting laboratory work left him using his textbook nearly every day. Other studies describe the powerful influences of the school culture and leadership, including principals, on new teachers' success or failure in their first few years. Hebert and Worthy (2001) found that one new teacher's "successful" induction depended on her learning to enter the culture of the school and a match between the new teacher's personality and temperament with that of her colleagues. Flores and Day (2006) followed a cohort of 14 new teachers through their first two years of teaching and found that where the school cultures emphasized teachers' adherence to bureaucratic rules and extra non-instructional duties, those teachers grew more conservative in their teaching practice in order to comply with directives and manage their workloads while maintaining a belief that their teaching *should be* different than it is.

However, the research literature is relatively thin on the influence of these aspects of school and classroom context on student teachers, perhaps because student teachers are seen as short-term visitors to a school rather than as more permanent members of the school community. Alternatively, this may be because researchers tend to use theoretical frameworks that do not foreground context as an important aspect of field experience,

opting instead for other factors already described (cooperating teachers, university supervisors, or teacher education coursework). For example, Bruckerhoff and Carlson (1995) documented a case study of a struggling and undersupported student teacher in an urban school, but attributed the problems less to the urban context and more to poor mentoring and a lack of professional behavior on the part of the cooperating teacher and university. In this study's setting, however, student teachers spend a full year in the schools and were expected to participate in many of the functions of full-time teachers (like parent conferences and staff meetings). It seems reasonable to assume that the school and classroom contexts that influence new teachers might also be relevant to the interns in this study. As a result, they were a part of the intern experience documented in this study.

In summary, most previous research has documented the effectiveness of that field experience through studying its components, including university courses, university supervisors, and cooperating teachers. This framing assumes an additive effect; that as teachers go through a field experience and participate in its components, each component changes teachers in some way —sometimes a little, sometimes a lot, sometimes for good, and sometimes for bad —and that one can study the effects of field experience by isolating the effects of the components. It also assumes that programs are relatively monolithic and that each teacher receives the same "treatment" in each program component.

This study, as I will describe in the following section, frames the problem of field experiences for beginning science teachers differently. Rather than presuming either that learning to teach is linear or additive, or that the problem to be investigated concerns how

to "control" various aspects of a teacher preparation program so as to increase its effectiveness, I am interested in taking an ecological perspective on understanding student teaching. An ecological approach is holistic in that it focuses on describing reciprocal, dynamic, and evolving relationships between individuals, groups, and the places in which they live and work. Thus from an ecological perspective, understanding the intern experience means understanding the interrelationships of university experiences (like coursework), school experiences (like teaching, planning, and curriculum), university personnel (like university supervisors and course instructors), and school personnel (like cooperating teachers, principals, parents, and students).

Taking a Holistic Perspective on Learning to Teach Science

As noted, this study takes an ecological and holistic perspective on science internships. Here I will explain my conceptualization of the internship and new teacher growth by considering two questions: In what environments are interns immersed? How do I understand the changes interns undergo as they move through these environments?

The "Ecology" of Student Teaching

Wideen, Mayer-Smith, and Moon (1998) argue that improved teacher education research would take an ecological perspective; that is, it would recognize, as is true for an ecosystem, that "everything is connected to everything else" (p. 168). Many studies of student teaching isolate factors/components without looking at the "content and context" of the experience as a whole (Zeichner, 1986), or using the ecology metaphor, examine only particular organisms without considering that organism's relationship to other organisms and to the environment. In this study, I document the interactions between an

intern and the components of that intern's ecology as well as the relationships between the components.

Figure 1.1 below shows a conceptualization of the ecology of the internship. The major influences on student teachers (as discussed above) surround the intern. Double-headed arrows indicate interaction between the ecological components. For example, we see arrows connecting the cooperating teacher to a) the student teacher (as they interact on a daily basis), b) the school/classroom context (as the cooperating teacher teaches and mentors within a school and classroom community), and c) the university supervisor (as the cooperating teacher meets with the supervisor during visits, conferences, or evaluations). While not drawn, an interaction might also be possible between the cooperating teacher and teacher education (as when a cooperating teacher attends orientation meetings hosted by the university). I have also included arrows between the intern and the cooperating teacher ⇔university supervisor interaction. In a case like this, the intern, in addition to interacting with one or the other independently, might interact with the two of them in interaction, for example, during an evaluative conference or after a class taught by the intern which both of them observed. In the same way, the intern may also interact with the cooperating teacher ⇔ classroom context interaction as he or she observes the cooperating teacher teach a lesson in their shared classroom.

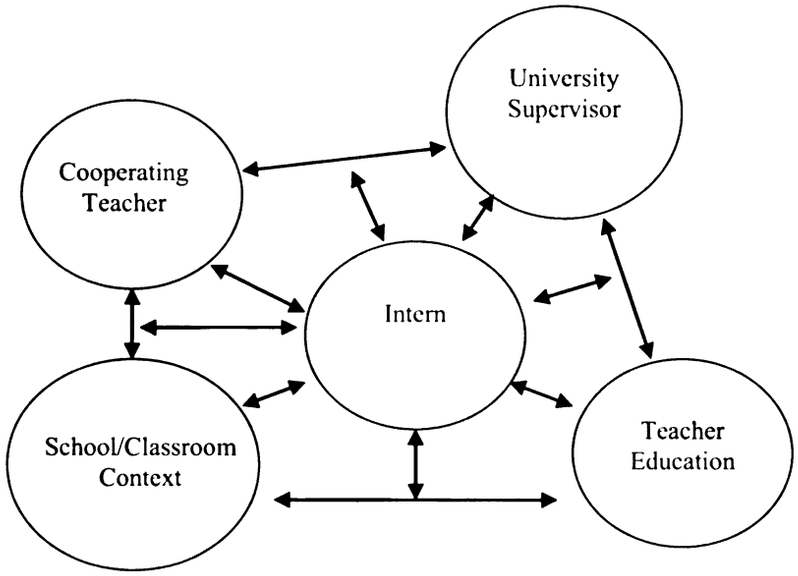

Figure 1.1. The ecology of the internship

There are some important ways in which my use of "ecology" is different from a scientific use. First, when studying an ecological system, one might see connections that continue to branch out beyond one trophic level; that is, one might see the relationship between the insects that consume plants, but also the sparrow that consumes the insects and the cat that consumes the sparrow. One could imagine that the university supervisor has his or her own ecology that might include doctoral coursework, teaching experience, professional colleagues and so on, and that teacher education itself exists in a web of state policies, university affiliations, accreditation and so on. All of that exists within the ecology of student teaching or internships as an institution, but will be beyond the scope of this study. Here I concentrate on those components that are one degree from the student teacher, including interactions between those components; the ecology I describe keeps the intern at the center.

Second, in an ecological food web, single-headed arrows indicate the direction of the flow of energy; as the cow eats the hay, one finds an arrow moving from the hay

toward the cow. Here, my arrows are double-headed indicating that the potential for exchange is reciprocal; for example, student teachers may influence the cooperating teacher, but the cooperating teacher may be influenced by the teacher as well (Lacey, 1977; Zeichner & Gore, 1990). It is, for instance, common for cooperating teachers to say that they enjoy learning about new ideas that new teachers bring with them to schools.

The question, however, of the nature of those arrows still remains. What is meant by an "interaction" between cooperating teacher and student teacher or teacher education and student teacher? I will view interactions between various actors as a process of *socialization.* Zeichner and Gore (1990) broadly define teacher socialization as "the process by which the individual becomes a participating member of the society of teachers" (p. 329), so in this case, the arrows become events or situations in which "becoming a member" occurs.

More specifically, however, I am using an interpretive paradigm of socialization (Lacey, 1977; Zeichner & Gore, 1990). The important assumptions I make include:

(1) That the interpretation of events by actors in socialization is as important as the event itself and that interpretation will necessarily be subjective. In an interpretive view of socialization, one seeks less to generalize socialization processes to a larger population, and more to understand the process as it occurs with its individual and subjective nuance (Lacey, 1977).

(2) That while there are important structural constraints on members of the ecology that may influence their behavior or perspectives, people retain agency in making choices about how they will respond to those constraints

and pressures (Zeichner & Gore, 1990). Structure influences —but does not determine —people's actions.

(3) That changes may occur to student teachers at different levels within the teacher. For example, in Lacey's (1977) idea of "strategic compliance," teachers changed behavior (e.g., taught more like their mentor) in order to gain an advantage (e.g., receive a better review), while also retaining perspectives that contradict that behavior.

The implications of using an interpretive view of socialization are correspondingly threefold. First, I will seek subjective interpretations of the events rather than only considering my interpretations. Second, while interns are the subject of socialization in this study, I will view them as agents in the process of socialization who are being influenced by socialization pressures while also influencing the environments around them (hence, the reason for double-headed arrows). And third, I will view interns as being capable of change at different levels rather than assuming, as examples, that changes in a teacher's behavior necessarily indicate changes in that teacher's beliefs about teaching or that a teacher's improvement in developing a skill means that teacher views him or herself as a different kind of teacher. I return to this third point below.

Cross-sectional Slices of the Internship

An issue that arises when using an ecological approach is that the frame keeps many interrelated things in the foreground at once. I critiqued other studies for attempting to isolate effects of individual components (e.g., the impact of the cooperating teacher on student teachers), while neglecting the more holistic and interrelated picture. In my view, studies like these can be represented by the dark oval in Figure 1.2 (see below); only the

cooperating teacher, the intern, and the interaction between the two are kept in the foreground, and the other components of the ecology (of which there are many) have to be neglected. While I believe that neglect limits those studies, the reason for such decisions is understandable; one cannot look at everything.

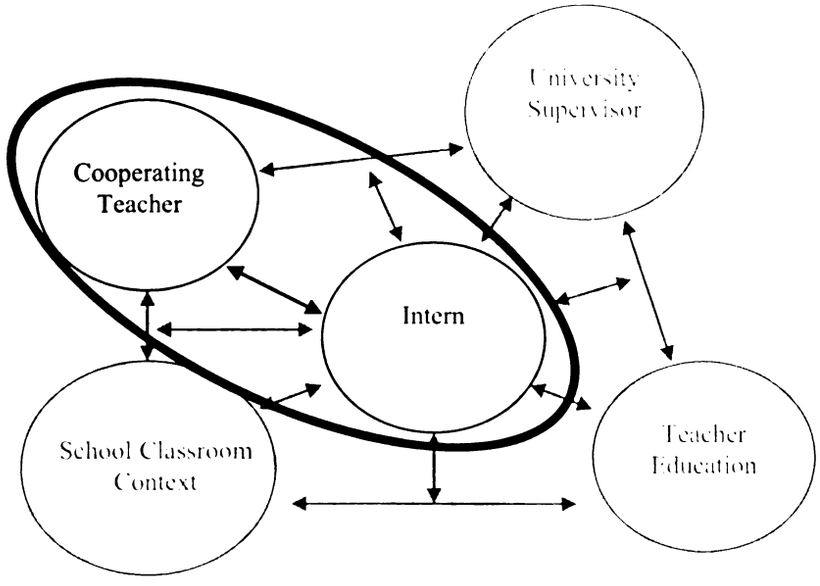

Figure 1.2. Studying a component of an internship in isolation

Given the dual constraints of not looking at everything and keeping an ecological and holistic view, I elected to consider two "cross-sections" of the internship in order to keep all ecological components in the foreground but limit how much of each component I might be able to see. With cross-sections, I am limited in that I no longer can see everything about an intern and her socialization. Rather, I will have only slices of the intern and the components of her ecology, but within those slices, those components will remain in interaction with one another. In doing this, I limited the data I collected and the analysis I conducted without sacrificing the holistic and ecological nature of the study.

My first cross-section was classroom management and ways of relating to students. As described earlier, some studies report that student teachers and new teachers tend to become more custodial and authoritarian in their interactions and views of students (W. K. Hoy & Rees, 1977; W. K. Hoy & Woolfolk, 1990; Veenman, 1984). It is suggested that they are socialized by the environment around them (e.g. model cooperating teacher's practice, responding to student misbehavior) and that these socialization pressures alter their beliefs (W. K. Hoy & Woolfolk, 1990). In this study, my attention during all aspects of data collection kept classroom management in the foreground.

The second cross-section was the use of inquiry in the classroom. Scientific inquiry is a central feature of the current reform efforts of science education (National Research Council (NRC), 1996, 2000) and is an emphasis of the science teacher preparation program under study. Inquiry can be considered both content to be taught and an instructional model for teaching content (NRC, 2000). As content, inquiry "refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work" (NRC, 2000, p. 1). Students are expected to learn *about* these methods of science —that scientists ask questions, rely on other scientists' research, propose possible and tentative explanations, rely on evidence to create and critique explanations, and make their work public. These ideas about science are propositions that students could learn, recite, and understand about science. As a model for instruction, inquiry, it is argued, is the best way for students to learn about the way scientists work as they engage in practices similar to scientists; in other words, students' experiences in the classroom should be "parallel" with scientists' experiences as

scientists (NRC, 2000, p. 10). While there is seemingly broad appeal for and wide use of "inquiry" in the science education literature, the details of inquiry are contested (Settlage, 2007) or, more problematic, left undefined in use (Abrams, Southerland, & Silva, 2007). Inquiry, then, became an important way for me to see how this important idea for reformers moves across the ecology of the intern.

To summarize, these cross-sections serve as diverse instances to study the process of intern socialization. One slice will focus on classroom management and socialization of the intern around classroom management (generously defined to include routines of managing groups, as well as relationships with students), while the second will focus on inquiry and the practices promoted by science education reformers. Each enjoys a prominent place in the research literature, teacher education, and in the practices of student teachers. Finally, each has associated with a variety of practices, knowledge, beliefs, and ways of being that will allow me to investigate these cross-sectional slices across multiple levels of the teacher, which I will describe next.

Levels of Change in Teachers

Having described the ecology of interns and the cross-sectional slices of the ecology that I will study, I now turn to describing the outcomes I seek to understand. Fred Korthagen and his colleagues (Korthagen, 1993, 2001, 2004; Korthagen & Kessels, 1999; Korthagen & Lagerwerf, 1996; Tigchelaar & Korthagen, 2004; Wubbels, Korthagen, & Broekman, 1997) have made significant theoretical and empirical contributions in their emphasis on the "holistic" nature of the work of teaching, arguing against models of teacher behavior that are solely cognitive or competency-based in favor of ones that

account for sub-conscious, affective, or identity-related components of the work (Korthagen, 2004; Korthagen & Lagerwerf, 1996).

Korthagen (2004) calls for a more holistic model of teaching that attempts to complicate and explicate the relationship between the behavior/competency side of teaching and more personal characteristics like beliefs and identity. In the "onion model" (See Figure 1.3), the teacher is represented as a series of concentric circles, each of which represents a different layer, or level, of the self. Those outside levels (behavior and competencies) are more readily observed and also more directly influenced by the outside environment. As one moves deeper into the onion (beliefs, identity, and mission), the levels become more difficult to observe directly and may be further from direct environmental influence. Levels are not independent of one another; the environment and outer levels may influence changes in the inner levels as in the case when a challenging student (the environment) may cause the teacher to seek new skills (competencies) for dealing with that child, which if successful, might change the teachers' views (beliefs) about how children behave. Likewise, the beliefs a teacher has about teaching might influence the competencies she chooses to develop and, consequently, the practice (behavior) she employs in her classroom.

The strength of the model is its insistence on keeping the whole teacher in consideration at one time, while still allowing distinctions to be made at each level. As a teacher educator, I am fascinated by the apparent contradictions that sometimes seem at play: a young teacher who espouses strong commitments to social justice, while employing the strategies of a tyrant (Bruckerhoff & Carlson, 1995), or one deeply committed to scientific inquiry in the classroom who relies almost entirely on his

textbook (Powell, 1997), or a student teacher, convinced of his own efficacy as a lecturer, who develops the ability to lead student-centered work (Graham, 1999). One could assume that the only thing that matters is what they practice, that the first teacher *is* a tyrant, the second a traditionalist, and the third a progressive. But this model allows one to say that many things may be happening to a new teacher all at the same time, even in contradictory ways. She may be developing skills for teaching practices that go against her beliefs about how students learn or even contradict who she envisions she is as a teacher. He may be stirred in his soul by something he reads but not be able to picture its application in a classroom.

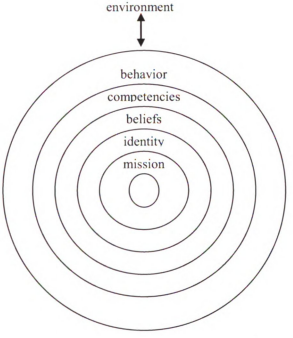

Figure 1.3. The Onion Model: Levels of change in a teacher (Korthagen, 2004, p. 80)

But all these changes may be important in helping us understand the influence of teacher education and student teaching on the development of teachers, especially if, as the model suggests, these levels can influence each other. For this study, I have chosen to

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simplify Korthagen's model to focus on the feature that I find most compelling—the idea that how a teacher behaves and what a teacher knows how to do may conflict with, influence, and be influenced by what they believe and who they believe themselves to be. In my analysis, I will highlight the ways in which these levels within interns interact and change over time as a result of the influence of the ecology they find themselves in.

Looking Ahead

Having reviewed the literature and provided an overview of my conceptual framing of the study, I now turn to a description of the methods used in the study as well as a guide to the contexts being studied (chapter 2). In chapter 3, I present findings on the changes to interns that take place over the course of the internship, focusing particularly on the ways in which their cooperating teachers shape the interns teaching practices and beliefs. In chapter 4, I focus closely on the work the interns do when they are in their school sites and the interactions between interns and their cooperating teachers. In chapter 5, I examine other aspects of the intern ecology—the work that interns due with their teacher education course instructors and field instructors (university supervisors). Chapter 6 concludes by bringing the analyses in chapter 3, 4, and 5 together—in essence, returning to a full ecological picture—before discussing the implications for this study on the work of teacher educators and university-based teacher education programs.

Chapter 2
Methods and Context

This study was designed as a multi-site ethnography of the fifth-year science teaching internship within a teacher education program. As I have described in my theoretical framework, I intend to describe and explain the effects of the ecology of the internship on the socialization of interns. In this chapter, I begin by describing the study settings and methods for data collection and analysis. In the second half of the chapter, I describe the study's participants and context in greater detail.

State's Teacher Education Program

Interns enroll in the secondary teacher preparation program at State University[1] with the intention of gaining certification as a secondary science teacher. The program is designed to be five years. During the first four years, preservice science teachers major in a scientific discipline and receive a Bachelor's degree from one of the University's science departments. During that time, they also complete required courses within the College of Education. Some of these courses are relatively general and are taken by all education majors, addressing topics like principles of learning, diversity, and content-area literacy. In addition, during their fourth year, all secondary science preservice teachers complete an 11-credit hour course series designed for secondary science teaching. These science-specific courses include what might typically be called "science methods," but also address classroom management, microteaching, and coordination of field placement experiences in local schools. During the spring of their senior year, prospective teachers prepare resumes and "apply" for consideration in high schools located in three general regions in the state: in the middle of the state and close to the university, in an urban

[1] All names of people, institutions, and cities used throughout are pseudonyms.

center in the eastern part of the state, and in an urban center in the western part of the state.

The internship, the focus of this study, takes place during preservice teachers' fifth year at the university, after they have obtained Bachelor's degrees. The internship lasts almost one full school year, beginning in August (corresponding to the school placement's calendar) and ending in late spring (corresponding to the end of the university semester). As designed, interns begin the year at their school placements taking responsibility for one "focal class"—a group of students for whom they will have primary responsibility throughout the entire year—while assisting and observing their cooperating teachers during the other classes. Twice during the fall semester, interns increase their teaching load for two to three week periods (called "guided lead teaching"), during which they may take on the responsibility for planning and teaching one or more of their cooperating teachers' classes in addition to their focal class. Finally, in the spring semester, interns assume full responsibility for teaching four classes over an approximately 10-week time period (called "lead teaching"); this experience is the culminating event of the internship. The program is thus modeled on a scaffolded entry into teaching, informed by sociocultural and socio-cognitive theories of apprenticeship and participation (Feiman-Nemser, 2001).

Each intern is assigned one cooperating teacher, an employee of a local school district, who serves as the intern's primary mentor throughout the year (some interns may have two cooperating teachers if they are becoming certified in multiple subjects). Interns teach in their cooperating teachers' classrooms, and an intern's students are officially students of the cooperating teacher; that is, the cooperating teacher is the "teacher of

record." Interns are also assigned one field instructor, a university employee, who serves in the "university supervisor" role. The field instructor visits the classroom of each intern once every two or three weeks, on average, to make classroom observations. In this study, both field instructors were graduate students in State's doctoral program, though retired teachers are commonly employed as well. The field instructor has both a teaching role, in that he or she may give feedback, support, and advice to interns, and a supervisory role, in that he or she completes regular, program-required evaluations of intern progress. Thus, for this program, field instructors assume both the "assessing and assisting" functions of mentoring/coaching (Slick, 1997).

During this internship, interns are also completing teacher education coursework. They attend classes on most Fridays at the university. One of their courses (called here TE Science) is science-specific; all science interns take the same course and, in the year of this study, it was taught by two university faculty with backgrounds in science and science teaching. The other course (called here TE Professional) is site-specific and generic; interns are grouped into sections by the location of their internship. For example, all interns placed in urban high schools (regardless of their subject-area) might be in one section, while another section might include all teachers in neighboring suburban middle schools. As a general division of labor, TE Science attends to issues of planning and instruction (thought to be more discipline-specific) while TE Professional attends to broader professional issues like classroom management, working with various stakeholders, and teachers' professional and ethical obligations.

Participants

Sampling for this study proceeded using criterion-based selection of interns, in which I specified prior to the study's onset a list of criteria my sample would meet (LeCompte & Preissle, 1993). The criteria included: 1) each intern would be starting an internship in the Fall Semester of 2008; 2) each intern would be working in a high-school near State's campus, thus making ethnographic data collection possible as interns moved between the school and TE settings; 3) the interns would be selected so that there would be two interns per school site to allow for similarities and contrasts across the ecologies of the interns; and 4) the schools would serve communities with contrasting socioeconomic status increasing the variation within the school/classroom context component of the ecology.[2]

After receiving permission from State University's Institutional Review Board to conduct the study, I located a list of all secondary science interns placed in schools within an approximately 30 mile radius of campus and identified all schools that had at least two science interns. Based on consultation with experienced teacher educators in the area as well as using demographic statistics, I initially selected the two schools (Quincy High and Randolph High) most divergent in terms of the student population they serve. However, Quincy High could not grant permission to conduct research in the schools prior to the

[2] Achinstein, Ogawa, and Speiglman (2004) found that the influence of district policies and curricular decisions, made in response to state and national pressure over test scores, led to very different socialization outcomes for beginning reading teachers. They followed about ten new teachers each in a "high-capital" and "low-capital" district, looking at the development of teachers' beliefs and practices as well as the hiring practices, professional cultures, and responses to state policies of each district. They found that teachers in the lower capital district, serving poorer and a higher proportion of minority students, were socialized into different literacy teaching practices (more teacher-centered, more scripted) than their higher capital counterparts.

school year starting. As a result, I selected a third school (Vincent High) to begin the consenting process. In the end, however, all six interns, cooperating teachers, and schools consented, leaving me with six interns at three schools in the sample.

Table 2.1 provides an overview of the three school sites for this study. After describing data collection and analysis, I will describe the schools and their communities and provide "character sketches" of each participant.

Table 2.1. Demographic Profiles of School Sites

School	Interns (Mentor Teachers)	State Field Instructor	Grades	Setting	# of Students	% White, non Hispanic	% Free or Reduced Lunch	Graduation Rate
Vincent High School	Heather (Ken) & Cindy (Shannon)	Hee-Sun	9-12	Suburban	~950	~90%	~10%	>95%
Randolph High School	Tammy (Vince) & Chad (Frank)	Hee-Sun	10-12	Suburban	~1450	~85%	~20%	~90%
Quincy High School	Kimberly (Bonnie) & Holly (Michael)	Sam	9-12	Urban	~1400	~45%	~55%	~75%

Data Collection

Eisenhart (1988) identifies three data collection strategies commonly used by ethnographers in their attempt "to understand (holistically) the worlds of others and themselves" (p. 105): participant observation, ethnographic interviewing, and artifacts. In this case, the world being studied is that of the secondary science intern. I will describe below my use of each.

Participant Observation

Eisenhart (1988) describes participant observation as resting along a continuum from participant to observer and states that one's placement on that continuum may

change during the course of a study. I did not have an official role with either the school districts or the teacher education program during the year of the study. However, in the year prior to data collection, I served as a course instructor to the six interns selected in the sample. As a result, I did not assume that I would be viewed by the interns as a neutral observer; most likely, I would be viewed as a teacher educator, the role I had served with them the previous year. (I will discuss more fully this limitation at the end of this chapter.) While recruiting participants, I explicitly addressed the role I hoped to play in an intern's class (that of a researcher), but also gave them permission to negotiate my presence in ways that they might find beneficial (Cole & Knowles, 1993b). All the interns at the time of consent gave me permission to participate in any experiences they might have as interns and did not express to me any reservations about my participation. However, once I began attending classrooms, the cooperating teachers and I negotiated aspects of my participation. For example, in Holly's classroom, Michael (her mentor) explicitly told me that I could act "as a fly on the wall" and provided me with a chair in the back corner that I could use when I visited. With the exception of lunch time (when I would eat with Holly and Michael), I stayed in that chair. On the other hand, in Tammy's classroom, Vince gave me permission to feel free to wander the room during teaching and I did. Sometimes, I would walk around the room eavesdropping on student and teacher conversations or providing assistance to students if asked; at other times, I would park in one spot for the day.

What did I observe? Recall Figure 1.1, in which I mapped out the ecology of student teaching and the various interactions (double-headed arrows) that might occur that would influence socialization. To understand the ecology, I needed to observe

occurrences where the ecological components might be in interaction with one another. In Table 2.2 below, the first column identifies a particular interaction suggested by the framework, while the second column identifies the situation in which I observed such an interaction. For example, the first row (I—CT) identifies one of the most common interactions of the internship, that of the intern with his or her mentor. Much less common, for example, was the fifteenth row (CT—TE), where interaction would take place between the cooperating teachers and the teacher education program.

Thus the ecological framework and this list of interactions provided me with a methodological tool to make sure I was seeing the full ecology of the internship. I used it to make "plans deliberately to spend time in (these) particular places, at (these) particular times" (Erickson, 1986, p. 143).

Table 2.2. Matrix of Data Collection

Interaction	Observations	Interviews	Artifacts
I – CT	During Intern Teaching During CT Teaching Planning Periods Lunch Periods Before/After School	I CT	
I – US	US visits Evening Meetings for US and Interns	I US	Observation Feedback Email Journals & responses Formal Evaluations
I – CC	During Intern teaching Before and After School Faculty Meetings Lunch Periods	I CT	
I – TE	During TE classes	I Course Instructors	Course Assignments
CT — US	Evaluation Conferences US visits	CT US	
I – (CT—US)	Evaluation Conferences US visits	I US CT	Formal Evaluations
CT — CC	During Intern Teaching During CT teaching Parent conferences Faculty meetings	I CT	
I – (CT—CC)	During CT teaching w/ intern assisting Parent conferences Staff meetings	I CT	
CC — TE		Course Instructors	
I – (CC—TE)		I	
US – TE		US	Program Rubric & Standards
I – (US—TE)	US Visits to TE courses		
US – CC (not shown)	US visits	US	
I – (US—CC) (not shown)	US visits	US ST	Observation Feedback Email Journal and Responses
CT – TE (not shown)	Opening Institute Mentor Meetings with Course Instructors	CT	Agenda/ Materials for Meetings
I – (CT—TE) (not shown)	Opening Institute After Mentor Meetings	CT	Agenda/Materials for Meetings

Key: I= Intern, CT = cooperating teacher, US = University Supervisor, CC = Classroom context, TE = teacher education program

In the end, my fieldwork entailed four major categories of observations that covered most of the interactions in Table 2.2: school, school with field instructors present, teacher education courses, and outside meetings. Table 2.3 summarizes the number of observations I made and the total duration of those observations in each of those broad categories. In the school visits, I attempted to shadow the intern through his or her day. Early in the school year, interns spent much of their time observing their mentors teach and assisting their mentors; this meant that much of my observation was of their mentors teaching. As the year progressed, I observed greater proportions of interns' teaching. This observing in schools also meant documenting the moments "off-stage" where interns were not teaching or watching their mentor teach—friendly conversations with other interns in the school, lunch with other school staff, planning lessons with their mentors, making copies, meeting with students at lunch, grading papers, and talking with parents on the phone. On most occasions, I spent half days with interns, either in the morning or afternoon. On morning visits, I tried to arrive when the intern did (as much as an hour before classes began) and stay through lunch. On afternoon visits, I would often stay until the intern was packing his or her bags for home. The intention was to capture the full range of activities that interns engaged in on a daily basis.

Table 2.3. Summary of Number and Duration of Field Observations

Fieldwork Category	Number of Observations	Hours of Observations
School	56	216
School with field instructor present	26	38
Teacher education courses	16	44
Outside meetings	6	13

Field instructors generally attempted to visit interns once every two to three weeks for a total of at least 10 observations throughout the year. In addition, field instructors met with cooperating teacher-intern pairs twice during each semester to discuss intern progress. On 26 occasions, I documented work in the school on days when field instructors were present. Eighteen of those visits were at formal evaluative conferences in which the field instructor, cooperating teacher, and interns met to discuss the interns' progress and to produce written evaluations that were sent to the teacher education program. These meetings, including the informal chatter before and after, generally lasted about an hour. I did not participate in these meetings; instead, I sat at the table and recorded by hand as much of the dialogue as I could as well as collected copies of the formal evaluations. On six other occasions (once with each intern), I shadowed the field instructor through a visit to the intern, which included documenting the field instructor observing the intern and the post-conference that followed. Finally, on two occasions, I happened to be visiting the intern when the field instructor arrived for an observation and documented that interaction.

Interns attended teacher education courses on 10 Fridays each semester for a total of 20 course meetings in both TE Professional and TE Science. I attended 16 teacher education courses throughout the year, four for each of the instructors in my study. Because the science interns in the study attended TE Science together and attended three different TE Professional courses, this meant I observed more TE Professional courses than I did TE Science. In total, I observed TE Professional courses twelve times and TE Science four times. During TE courses, I took a low profile role, often sitting in a back corner away from the rest of the class where I could as unobtrusively as possible record

what happened. When interns sat in small groups, I would generally join a group in which one of the study's interns was participating. Classes met for three hours at a time and on most occasions I documented the full duration of the class.

I also documented six other meetings. Three times during the year, the teacher education faculty hosted cooperating teachers. The first of these was the Opening Institute—an orientation meeting for interns and cooperating teachers that introduced course instructors as well as highlighted some of the key deadlines and structural components of the program. In addition, two other meetings were held for cooperating teachers, field instructors, and TE faculty to talk without the interns present. I documented all three of these meetings. Finally, field instructors occasionally held gatherings for all the interns with whom they worked. These were held after school at an interns' house or apartment, or, on occasion, on campus at a restaurant. I documented three of these meetings.

While in the field, I used "jottings" as a method for taking fieldnotes, concentrating on capturing particular and pertinent details of the action I witnessed, focusing most closely on capturing quotations that might be harder to remember at a later time (Emerson, Fretz, & Shaw, 1995). These rough notes were then written into a narrative form that were "intelligible to anyone, not just to (me)" shortly after leaving the field setting (Miles & Huberman, 1984, p. 50). On most occasions, these notes were written up the day of the observation, though in some cases I waited until the following morning to complete them. In total, these fieldnotes span about 300 hours in the professional lives of interns.

Interviews

In addition to participant observations, I conducted semi-structured interviews with the interns and each intern's cooperating teacher, field instructor, and course instructors. The interviews allowed me to check my observations against the meanings the participants assigned to events and interactions as well as to gather data about interactions for which I did not have access. In addition, those levels of change that lie further from observation (like beliefs, identity, and mission) may be more difficult to observe directly (Korthagen, 2004), so interviews were an important supplementary source of data. All interviews were tape-recorded and transcribed for analysis.

I conducted three interviews with each intern, one before the internship began, one near the middle, and one after the interns had completed their lead teaching. The opening interview (Appendix A) focused first on the interns' reasons for choosing teaching as a career and the influential visions or role models they had. These were intended to elicit information about interns' beliefs, identity, and mission. In addition, I asked some targeted questions about classroom management, inquiry, and using student ideas in order to establish a baseline for each intern prior to the internship beginning. The two follow-up interviews (Appendix B) asked questions similar to the opening interview, but included questions that allowed the intern to characterize the interactions they had with the various members of their ecology. While the interview protocols look structured, the interviews were actually free-ranging and interns used the opportunities to talk and vent about their internship to me, a captive audience.

In addition, for both the second and third interviews, I prepared by reviewing all of the data that I had for that intern, as well as discussing with my advisor any emergent

themes in the study. I tailored the interviews to check emergent themes and to fill in gaps in my understanding. I often asked about key events I had documented in order to get their reactions to them. Interviews were conducted in a variety of places: local coffeeshops or restaurants, offices on campus, or rooms in the interns' schools. Opening interviews ranged from 40 to 50 minutes, and averaged 45 minutes. Midpoint interviews ranged from 89 to 119 minutes, with an average of 102 minutes. Final interviews ranged from 61 to 81 minutes, with an average of 70 minutes. In total, I recorded over 21 hours of interviews with interns.

I conducted two interviews with each cooperating teacher (Appendices C and D) and field instructor (Appendices E and F), one closer to the beginning of the year and one nearer the end. After collecting some background information, I probed these participants' ideas about teaching, followed by their perceptions about the different ecological interactions. In the early interview, I focused more on their past experiences as cooperating teachers or field instructors, as well as their ideas about the context in which the intern is working. The later interview asked them to describe the interactions with components of the ecology throughout the year and to describe their views on the interns' progress and performance throughout the year. All interviews with the cooperating teachers were conducted at the school sites in locations where the interns could not overhear. Opening interviews with the cooperating teacher ranged from 47 to 60 minutes, averaging of 50 minutes. Closing interviews with the cooperating teachers ranged from 52 to 67 minutes, with an average of 61 minutes. In total, I had 11 hours of interviews with the cooperating teachers. Opening interviews with the field instructors (Sam and

Hee-Sun) were 60 and 71 minutes, respectively, and the closing interviews were 62 and 73 minutes. Field instructor interviews were held on State's campus.

Finally, I conducted one interview with each intern's course instructors (Appendix G), both for the TE Science course (Rosa) and the TE Professional courses (Will, Sandy, and Cathleen). These interviews aimed to capture the ways in which those instructors think about teaching, the big ideas of their course, their thoughts on how the course went, and their relationship with the interns in the study and the other members of the interns' ecology. Interviews with course instructors were conducted in the course instructors' offices, except for Will's which was conducted in a empty classroom on State's campus. These four interviews ranged from 56 to 79 minutes long, averaging 69 minutes. The 38 interviews with all participants totaled just under 42 hours.

Artifacts

Finally, I collected copies of key artifacts from the internship experience in order to characterize the nature of the interactions between members of the ecology, as well as document the changes that occurred in the interns throughout the year. Table 2.4 lists the artifacts that I collected and the number of each. Artifacts were of particular importance in characterizing interns' relationships with TE (both course instructors and field instructors) because much of their correspondence occurred electronically.

All artifacts were collected directly from the interns themselves rather than from field instructors, course instructors, or State's teacher education program. I collected these documents from interns on a case-by-case basis. Some interns simply forwarded to me each course assignment or journal entry they received. Other, less organized interns spent some time at the end of the semester collecting the artifacts for me and then saved

them to my computer. One intern, Chad, did not provide me with any artifacts from the second semester. This means that I do not have a complete set of any of the classes of artifacts. While I have nearly 100 journal entries written by interns, there may be as many as 100 more that I did not collect. Likewise, of those 100 journal entries I do have, I only collected 55 of them with the feedback provided to them by field instructors. Interns and field instructors both told me that field instructors almost always provided feedback, so entries with missing feedback are likely holes in the dataset rather than evidence that interns were not receiving feedback. The same is true for course assignments. Since interns controlled what documents I received, they may have been selective about what they provided me. I do not have any evidence suggesting that they withheld documents that reflected on them more negatively, but that possibility exists.

Table 2.4. Internship Artifacts Collected

Class of Artifacts	Number Collected
Weekly journal entries written by interns	98 (55 with feedback from field instructors)
Science TE Course Assignments	31 (23 with feedback from course instructor)
Professional Responsibilities TE Course Assignments	17 (11 with feedback from course instructors)
Formal Evaluations from Cooperating Teacher	17
Formal Evaluations from Field Instructor	15
Formal Self-evaluations from intern	7
Observation feedback forms provided to interns from field instructor	13
Miscellaneous email correspondence between interns and field instructor and/or course instructors	4

Data Analysis

Data analysis began during the process of data collection through the writing up of fieldnotes (Emerson, Fretz, & Shaw, 1995). While the handwritten fieldnotes were

often nothing more than captured dialogue or short description of interns' or students' movements, the typed fieldnotes were more polished documents that represented my first attempt to impose a narrative structure to what I had just seen. In addition, I regularly met with my advisor throughout data collection and would share with her stories about events that seemed important or relevant or surprising; we discussed those events, tried to connect stories to other stories I had shared with her, and, in doing so, generated lists of articles or book I might read, as well as things I might keep my eyes open for in the field. During data collection, I also wrote short analytic memos that I shared with my advisor and others that served to solidify my thinking and prompt reaction from others (Emerson, Fretz, & Shaw, 1995). During this time, initial themes began to emerge inductively that I used to spark more formal data analysis.

Once data collection ended, I turned to more formal data analysis procedures. All fieldnotes and interview transcripts were imported into the qualitative analysis software NVivo 8. In addition, electronic artifacts (such as course assignments and emails) were imported into NVivo 8, though handwritten artifacts (such as lesson observations from field instructors) were scanned and stored electronically but not imported.

Coding using NVivo 8 began by finding a middle ground between a closed coding system preferred by Miles and Huberman (1984) and an open coding system proposed by Glaser (1978). Instead, I used a "general accounting scheme for codes that is not content-specific but that points toward the general domains in which codes will have to be inductively developed (Miles & Huberman, 1984, p. 57). In this case, my ecological framework suggested that a fruitful "initial accounting scheme" would be in the various ecological interactions experienced by interns and others in the ecology. The interactions

listed in Table 2.2 were the source of my initial codes. For example, as I read fieldnotes from an observation in a school, I coded the three minutes between classes where the intern talked with her cooperating teacher as I—CT, meaning the intern and cooperating teacher were interacting. The description of the lesson being taught by her mentor while the intern assisted was coded as I—(CT—CC), meaning the intern was interacting with the interaction of the cooperating teacher and classroom context. If during the lesson, the intern and cooperating teacher talked, then it would receive the code I—CT. For interviews, I coded based on what interviewees described, so if an intern told a story about how she and her mentor planned together, that portion of the transcript would receive I—CT. For artifacts, I coded based on what the artifact represented, as well as what it was reporting on. In other words, some artifacts (for example, an email journal) were examples of the intern interacting with the field instructor (as it was being sent from the intern to the field instructor) and would be coded I—FI. However, the journal might relate a story about a difficulty in the relationship between the intern and cooperating teacher; consequently, it would also receive a code of I—CT. What this initial coding scheme allowed me to do was to group all of a particular type of interaction into one place so that I could more easily look for patterns in those interactions as well as contrasts between the different kinds of interactions.

Once this coding had been completed, I read and re-read the data for each interaction type and began to inductively note themes that emerged across interactions. Initially, this was done by marking these as "Free Nodes" in NVivo 8; in other words, these codes were just marking text that I thought important with a key phrase. For example, in fieldnotes of a class I observed, I coded a portion of the text as "Emphasis on

Principles" when the instructor relayed a story about how, in her experience, administrators interviewing prospective teachers will want to know "what are the principles you have, the stance you take" rather than the details of a particular lesson. After several re-reads and open-coding (which took place while I continued to have discussions with colleagues and my advisor) hierarchical codes or "tree nodes" were created to reflect the patterns I was constructing from what I both saw in the open codes and could explain to colleagues. For example, the "Emphasis on Principles" code fell under the category of "Describing the Teacher Education World" and then under the code "Idea Orientation" along with two other codes at the same level of the hierarchy: "Reasoning Inductively" and "Reasoning Deductively." Once these new hierarchies were built, I re-read the data and coded the entire dataset one more time. This analysis then served as the outlines for my findings reported in Chapters 3, 4, and 5. While the process might sound linear, it was iterative and dialogical: my work with data occurred within a stream of other activities, including discussions about my study with colleagues, reading and re-reading materials that they suggested along the way, and attempts to write out my understandings.

Sketches of Placement Sites and Participants

In this section, I begin by providing brief "sketches" of the schools and communities that served as sites for this study, as well as provide background information regarding the interns and cooperating teachers. Following that, I describe briefly the participants in the teacher education program, along with overviews of the two courses that interns completed. These sketches are generated from fieldnotes and interviews.

Vincent High School

Vincent High School serves a suburban community outside a small Midwestern city. The community of Vincent is predominantly white and economically middle to upper-middle class, although there are pockets of working class or low income people in trailer parks and apartment complexes scattered throughout the district. In addition, some of the more expensive homes in the area have been built around a lake in Vincent. The town itself does not have a small-town feel to it; there is no "down-town Vincent" to speak of. Instead, it a collection of residential neighborhoods and housing developments that are tied together largely through the Vincent Public Schools, giving the schools considerable importance to the community, as they serve as a source of pride.

Vincent High School (VHS) serves 950 students, a size that teachers believe allows them to keep a small-school feel while also having enough resources to provide students with most of the electives and extra-curricular activities that larger schools offer. Many of the teachers at the high school have spent their entire careers in the Vincent school district. VHS students are high-achieving, earning an "A" in the state's report card system across all the disciplines tested. However, in the year before this study, the school—for the first time—failed to meet No Child Left Behind's adequate yearly progress (AYP) goals, as the special education sub-group reached a large enough size to "count" statistically in the school's ranking, and that sub-group did not meet the AYP standard. Although this failure was viewed by some teachers as failing on a technicality, it set off alarms within the community and served as an impetus for a school-wide reform led by the principal based on the "Failure is not an Option" model (Blankstein, 2004) and

an increasing emphasis on the state standards that guide the tests used to evaluate the schools.

Heather. Heather Johnston was placed at VHS with Ken Dansby, a 20-year veteran at Vincent. Heather is a Caucasian female who grew up in a middle-class family that highly valued education. For much of her childhood, she wanted to be a teacher and a coach. Her family was very supportive of this decision, although she met some resistance, particularly from her high school teachers, who thought that Heather had potential that would be wasted on teaching (a viewpoint she disdained). She majored in chemistry at the university with a minor in sociology and completed her Bachelor's degree in just three years. Heather exudes confidence and positivity; she remarked before the school year began that other interns she talked with were dwelling on "how nervous they were and how hard the year would be." She, on the other hand, was excited, sure she would face challenges, but confident that she could handle them.

Ken Dansby had a long history with the university teacher education program. He completed his undergraduate science degrees at State, as well as his teacher preparation, and had hosted an intern in his room every three years for the last 15, making Heather his fifth intern. He prefers the three-year cycle, because he finds the mentoring experience to be both a large amount of work (something he couldn't do every year) and professionally invigorating (because of the new ideas that interns bring from the university to his classroom). He spoke warmly about many of the State college of education faculty and took pride in his involvement with a program he finds to be "cutting-edge," good at preparing teachers, and "responsive to feedback that (it) gets from teachers in the field."

Ken is a leader of the VHS science department, having previously been the department chair and currently spearheading the department's curriculum reform. He has an intense personality, quick to show his emotions and share his problems, both personal and professional. This leads him to some conflict within the school, particularly with administrators, who he feels "question his professionalism and work ethic" in their attempts to implement new school reforms, and he has raised these concerns, sometimes angrily, in department or school-wide meetings. Ken views himself as a good teacher, a view validated by other teachers, parents, and students. During the year of this study, he was pursuing National Board Certification and was a regular contributor at professional conferences. At meetings held at State for mentoring teachers, Ken was a vocal contributor who impressed teacher education faculty with his professionalism and desire to learn.

Cindy. Cindy Miller was placed at VHS with Shannon Kent, a biology teacher at Vincent for about 10 years. Cindy's family tree is full of teachers; her father teaches middle-school math, her mother works as a program coordinator at the high school from which Cindy graduated, and her fiancée teaches special education. As Cindy describes it, her mother and father liked their jobs and made a happy, balanced life for their family. Despite that history and despite Cindy's success and enjoyment of school (she was valedictorian of her high school), she initially majored in zoology and took an internship as a zookeeper because of her love for animals. Very quickly, however, she realized that she needed more interaction with people and, in her words, "missed the science" in cleaning up and caring for animals. The summer following her graduation, she made the switch to teaching and joined State's teacher preparation program as one of only a few

post-baccalaureate students. Her family "supported (her) decision 100%." At VHS, Cindy's focus class was freshmen biology and she also taught human biology, an elective course for juniors and seniors. Cindy was described by those who worked with her as very caring, deeply reflective, and bright. She highly valued, prior to the internship, the opportunity to work with teenagers, and her mentor and field instructor both characterized her strength as building relationships with students. Cindy was not necessarily a "cool" teacher; she proudly proclaimed herself a "science dork" to students and peers alike, and the students attracted to her were often not those who were the more popular or the more successful in school.

Shannon Kent, Cindy's mentor, had been teaching biology for almost ten years though she had never served as a mentor for a State intern before the year of the study. Despite having worked with student teachers from other universities, she admitted that she did not know much about the program and depended on Cindy to keep her informed about program requirements. Shannon was active in the school, primarily through extracurricular events, serving as a class advisor as well as coaching the cross country and track teams; posters from her own marathons and other running paraphernalia adorn her classroom.

Cindy's relationship with Shannon was, at times, a difficult one; both used the metaphor of "college roommates" to describe the challenge of sharing space, time, and students. Cindy felt that Shannon occasionally undercut her authority in front of students and admitted she felt more relaxed when Shannon was not in the classroom; Shannon suspected this was the case and tried to leave as often as she could. Despite this tension, Shannon and Cindy spent a lot of time together, staying late after school to plan or

supervising the football game's concession stand together. Both spoke warmly of one another in final interviews.

Randolph High School

Randolph High School (RHS) also serves a predominantly white suburban community not far from Vincent. The community of Randolph is middle-class, with many new residential developments going up where farms had previously been. The school district also includes several small towns and a significant amount of rural students. In places, Randolph abuts with the city school district and along those boundaries sit a number of lower income housing developments, mobile home parks, and apartment complexes. Like Vincent, the schools of Randolph serve as the unifying influence on the community. The sports teams at Randolph High are an especially big deal; local shops throughout Randolph display posters with the football, basketball, or lacrosse team photos and schedules.

RHS serves 1450 students at its newly built 10-12 high school campus, with an additional 500 students on the 9th grade campus across the street. The building itself is impressive, sprawling, with enormous open lobby spaces where students congregate in between classes and at lunch in addition to a large gymnasium, natatorium, and state-of-the-art auditorium. Student achievement, however, lags behind some of Randolph's suburban counterparts; on the state report cards, scores are in the B or C categories, and, more importantly, the school has never met the AYP requirements. Like Vincent, the source of AYP failure is "sub-groups." Economically disadvantaged students and special education students have consistently fallen short of the targets. The economically-disadvantaged students are a particular source of frustration at the school; teachers talk

euphemistically about "a changing student demographic," particularly because RHS each year admits more and more students through the state's schools-of-choice program from the neighboring city. These students, from the teachers' perspective, are more often of color, more often of lower socioeconomic status, and more often underprepared academically. Because of these student achievement challenges, the district mandated changes in the school's curriculum, including common exams across the school that are supposed to be aligned with the state's exams. Teachers worry about how these exam results will be used by the district and they have become a source of tension across the school.

RHS has a long history with State's teacher education program. At one point, it served as a professional development school (PDS) where State's faculty taught and did research with Randolph's faculty serving many clinical roles at the University. While the official PDS label has been dropped, Randolph continues to host more interns than any other school and is considered by the university to have a larger contingent of "reform minded" teachers who understand State's mission and vision of good teaching. An additional legacy of the PDS designation is a once a week two-hour block of "professional development" time where teachers meet as a school, with departments, or on committees. This time for teachers serves as an important distinguishing feature of the school, one that represents a commitment to professionalism and teacher leadership.

Tammy. Tammy Ahrens was placed at Randolph High with Vince McCarthy, a six-year veteran who had himself been an intern in State's program at RHS. Tammy is a Caucasian female who grew up in a middle-class family and attended a smaller rural high school; school achievement was important to her family. She entered college as a zoology

major with an interest in conservation efforts, but a bad experience on a "study-abroad" trip to Africa left her disenchanted with the politics and money involved in those efforts. She decided to teach because it was an opportunity to stay involved with science and because she always liked and was good at school. Tammy had extensive experience working on plant genetics in undergraduate research, and, though she enjoyed it, did not see herself working in labs for a career. She was described by her State course and field instructors and by her cooperating teachers as having very strong content knowledge, and she was academically successful throughout her college career.

Tammy comes across to others as reserved, perhaps even shy. While thoughtful and thorough in her written coursework, Tammy is woman of few words. Even while teaching, she tended to have short, clipped explanations when compared to Vince. In conferences with Tammy, Vince, and Hee-Sun (Tammy's field instructor), Tammy said very little relative to other interns. Sometimes others perceived this reticence as aloofness or distance. Vince worried that he and Tammy did not talk enough, that they did not "click personally," and, early in the year, Hee-Sun shared with Tammy her worries that Tammy wasn't developing relationships with students like she should. Tammy, however, liked Vince a great deal, felt like they talked often, and found Hee-Sun's critiques disturbing because she considered her relationships with students as one of the most rewarding parts of her internship.

Vince McCarthy, in his sixth year at Randolph, had shared an intern and worked With pre-service teacher observers from State in the past, but Tammy was his first intern. He too had interned at RHS through State's teacher preparation program, taught for a year at another local school, and then accepted a half-time position at Randolph just to

get his foot in the door. His desire to get back to Randolph stemmed from his belief that "to do the kind of teaching (he) wanted to do" required being surrounded by other teachers who shared his commitment to student-centered, inquiry teaching. The RHS biology curriculum centered on a series of cases that structured weeks-long units by using, for example, a cholera epidemic to explore structure and function of cell parts or childhood birth defects to explore genetics. These units were during RHS's time as a PDS with the cooperation of Randolph and State faculty; Vince used them as an intern and continued to use modified versions in the year of the study. State's teacher educators fondly remembered Vince as a top student, mature beyond his classmates, and serious about his commitment to Randolph. It excited State to have him, as a graduate of the program and someone they believed practiced the teaching they promoted, serving as a cooperating teacher. As a teacher, Vince personally valued his relationships with students highly, and used his ability to connect with students as his primary tool for motivation and engagement. Students loved "Mr. M"; former students, boys and girls alike, stopped in frequently just to say "hi," share a success story, or repeat one of Vince's old jokes. He had an easy, low-key way in front of the classroom, used humor frequently, and seemed to enjoy playful banter with students.

Chad. Chad Brunswick interned with Frank Dack at RHS, teaching general chemistry, as well as a section of advanced algebra. Chad, a Caucasian, began at State as a chemical engineering major, but soon began to question whether he would "ever see the good" that came out of engineering, worrying "that it would be all about saving the company money." Teaching seemed like a more intimate experience, one where he could more readily see the good that he might accomplish. In the teacher education program, he

described being profoundly influenced by a course on student diversity, one that pushed him to consider issues of race and class and the way they influenced schooling. Chad identified some of the hand wringing at RHS over student achievement as "evidence that (they) aren't ready to deal with the growing issues of racial and class tension" at their school. His TE course instructors thought he was a particularly thoughtful guy. Prior to the internship year, Chad completed a summer internship with a large chemical company that initially convinced him he did not want to work in a lab, though throughout the school year he admitted that many times a job as a chemist seemed appealing compared to teaching.

Self-described as "really shy," Chad has an awkward manner, though—when comfortable—he can be funny and charming. I once observed Chad sip on a coffee mug during a lecture 13 times in the span of six minutes, an indication both of his nervousness and quirkiness. Again by his own admission, he tends toward negativity and, at times, his frustration with students' lack of motivation or cooperation led to him complaining to other interns about his students. As Chad remarked, the internship "had been a hard year." A long-term romantic relationship ended and his father lost his job, both of which increased Chad's general level of stress.

Frank Dack, Chad's mentor, is an institution at RHS. He had been a multiple-sport student-athlete at Randolph, still holding a track record over 20 years later. After student teaching in a nearby city, he was recruited back to his alma mater, where he has taught chemistry and coached a sport every season. Few call him "Frank" or "Mr. Dack." "Dack" is how he is known to students and teachers alike. He lives in Randolph, his children graduated from RHS, and he considers his connection to the community as one

of his strongest assets as a teacher. Frank was well-known to State's teacher education faculty, having served as a mentor to interns or student teacher close to 10 times over the years. He enjoyed having interns, sought to have one every other year, and spoke often of "passing the torch" off to the next generation as he approached retirement. While he tried to stay positive, he admitted that he was not as resilient or optimistic as he once had been; reforms seemed more cyclical than groundbreaking and changes (such as Randolph's switch from semesters to trimesters the previous school year) less easy to adapt to.

Speaking one-on-one with Frank, one might imagine him to be soft-spoken. He rarely talks at faculty meetings; when he does it is to throw in a wise-crack or advertise a social event. But in front of students, he is a dynamo of energy and enthusiasm. Students responded well to him; "Dack" was well-liked and well-known, despite his reputation as being the hardest chemistry teacher at RHS. While he was aware of the "inquiry" methods of teaching—and had even designed some inquiry units with State faculty many years ago—he had stopped using inquiry because he believed that there was not enough time to cover all the chemistry standards using those methods. He relied heavily on a recitational style of teaching, peppering students with questions during lectures and explanations, working through problems on the board, and having students practice those problems in groups as he assisted.

Quincy High School

Quincy High School (QHS) is one of several large urban high schools that is a part of the Auburn city school district. While most students at Quincy come from the nearest quadrant of Auburn, a number of "magnet" programs draw students around the city to the school. QHS is located near downtown Auburn, adjacent to a large hospital,

and less than a mile from modest government and business high-rises. As a city, Auburn is struggling; like many Midwestern cities, the downward spiral of the American auto industry has hit Auburn hard. Foreclosure signs are everywhere. QHS has a proud history; at one time, it served the wealthiest communities of Auburn and the building, constructed in the 1920s, shows that now-crumbling legacy through its ornate tiling and impressive woodwork.

QHS serves a diverse population 1400 students in grades 9-12; there is an approximately equal mix of Caucasian, African American, and Hispanic students, as well as many students classified as English as a Second Language. Teachers proudly report the fact that over 30 languages are spoken at home by students in the school. Academic achievement is low, as it is at all the high schools in Auburn; its report card grade was a D in the year of the study and it had failed to make AYP yet again. As a result of this chronic low achievement, the district had proposed many different restructuring plans for several years preceding this study. During the study year, the district proposed closing all the high schools and consolidating in one newly built high school, though this plan met great resistance from teachers and the Auburn community. In addition, Quincy hired a new principal just a days before the school year began, and the transition had been, predictably, a rough one. Teacher morale, according to my participants, was low and getting lower, though Quincy had a surprising number of afterschool programs and clubs all sponsored by faculty, many with little financial remuneration.

Every year, State placed a large number of interns at QHS, more than any other urban placement, in part, because it was closest geographically and, in part, because it had a reputation for being a bit more stable than the other urban high schools. Many QHS

teachers participated in research projects and professional development through various departments at the university and a significant number were graduates of State's teacher education program or had completed graduate work there. Despite these connections, State's faculty were sometimes uneasy with the placement of interns at Quincy; nearly every year, including the year of this study, interns were pulled from Quincy mid-year because of problems or crises. Faculty worried about how to balance the program's commitment to urban schooling with school conditions that made, in their view, Quincy less than ideal for learning to teach including significant classroom management problems (even for the mentors) that seemed to take interns' full attention at the expense of other things new teachers need to learn.

Kimberly. Kimberly Sui completed her internship at QHS with Bonnie Abrams, a 20-year veteran chemistry and biology teacher. Kimberly is a first generation Korean-American, whose parents, while not highly educated, valued education and pushed Kimberly to be successful. They held aspirations for Kimberly of being a physician, but were not disappointed in her decision to become a teacher because, as she described it, "in Korea, teachers are very highly respected." As an undergraduate, Kimberly served as a "buddy" to international graduate students, meeting regularly to converse in English and explain puzzling aspects of American culture and language. She received positive feedback, both from her buddies and the director of the program, that convinced Kimberly that she might be good at teaching. Given her initial pre-medicine major and the credits she had accumulated, she decided to try science teaching, though she also had a minor in ESL. While intending to teach science eventually, following the internship, Kimberly hoped to teach English in Korea for a year or two. In addition, because of her

passion for ESL, Kimberly was committed to working in urban schools where ethnic and linguistic diversity would be part of her experience. In this regard, her placement at Quincy was an excellent fit.

Kimberly was short in stature and spoke with a quiet voice —often in interviews I worried that my tape recorder might not pick up what she said. These qualities concerned her before the internship began, because she worried that students might not take her seriously; during her senior year placement at QHS, security guards had asked for a hall pass and students had mistaken her for one of them as she tried to move past them in the hallways. In addition, everyone who worked with her commented on how deferential and respectful she was, often apologizing as they mentioned it because it aligned so tightly to stereotypes of Asian students. Kimberly herself noted it as an issue. Despite a very close personal and professional working relationship, Kimberly could not bring herself to call her mentor "Bonnie," instead relying on the more formal "Ms. Abrams." Her State field instructor and course instructors worried that Kimberly might not be able to venture out on her own as much as other interns, both because Bonnie was known for not relinquishing control of the classroom easily and because Kimberly might not assert herself for fear of offending Bonnie.

Before teaching at QHS, Bonnie had taught in private religious schools and at the university level. She had served as a mentor to intern six or seven times before, and State teacher educators considered her to be one of their safest bets. She had a reputation, among students, other Quincy faculty, and among State teacher educators, as being no-nonsense, strict, and having high expectations for students. She accomplished this with a low-key manner. I never saw her raise her voice or demean students, though she

adamantly refused to do things for students that she believed they could do for themselves. If a student asked for a writing utensil, she would not provide one even if she had one in hand; they knew where to find the extra pencils. A question that could be answered from the textbook or notes would be deflected with some help about where a student might look. This emphasis on responsibility, procedures, and routines led to orderly classrooms where most students were on-task most of the time. While the hallways of QHS were filled with students being sent to administrators for misbehavior, I rarely saw Bonnie or Kimberly remove a student. Students treated Bonnie kindly, did what they were asked to do, and spent a great deal of time hanging out after school in her classroom. Bonnie still enjoyed teaching, viewed it as her calling, but characterized herself as a bit of a "lone ranger." While she participated in administrative tasks with colleagues like choosing textbooks or attending staff and department meetings, she disliked these aspects of her job and attempted to shield Kimberly from these tasks whenever possible. As a result, Kimberly interacted very little with other staff members at Quincy, with the exception of the chemistry teacher next door with whom she ate lunch regularly and, later in the year, observed.

Holly. Holly Lamberts was placed at QHS with Michael Delaney, also a 20-year veteran. Holly entered college as a philosophy major, and while she liked philosophy, she worried about job prospects. For a time, she majored in elementary education, took a few courses in elementary math education, but was not sure that she had the patience for young children. She settled on physics, because it, like philosophy, seemed to be asking "the big questions" and because she had done well in it in high school. Holly remembers being inspired by the idea presented to her in education course "that every child can

learn;" this idea struck her as profound because it contradicted much of how schools seemed to actually treat students. As a result, Holly was drawn to work in urban schools, where it seemed that many students were not learning and people seemed to accept that. Holly was committed to being an urban teacher, had requested senior placements and an intern placement in urban schools, and hoped to move to Chicago to teach in Chicago Public Schools after her internship. Based on her experiences during early field placements, she thought that generally teachers did not expect enough of students in urban schools.

Michael Delaney, Holly's mentor, has been a long-time science teacher at QHS. Michael plays an active part in many professional organizations; he had served in the teacher's union leadership, regularly presented at science teacher conferences, and had an impressive network with science-education partnerships that regularly came into his classroom to work with his students and provided him with professional development for curricular units that he brought back to Quincy. During the year of this study, Michael was seeking his National Board Certification. Michael had been enrolled in a Ph.D. program in State's College of Education, though the commitment of the program while teaching full-time was eventually more than he wanted to handle. At Quincy, Mr. Delaney was well-liked by students; many times, old students would stick their heads in to say "hi," and Michael consistently greeted current students warmly, by name, with a personal comment ("I like your hair today, Taneisha" or "How'd the games go last night, Jacob?") as they entered each day. In interviews, Mr. Delaney talked about the importance of forming relationships with students, especially in urban schools.

Michael had served as a cooperating teacher several times before the year of the study. However, faculty at State expressed some hesitation about his participation, because, in the past, interns had been asked to do more than the university thought they should. One teacher educator expressed that she "didn't really know what to think of Michael. He seemed to talk a good game, but (she had her) doubts about what he was really like." At times, Holly's schedule and Michael's personal and professional lives reduced the time that the two had to interact. Holly taught a math class (her minor) with another mentor during 2nd bell—Michael's only prep bell—which reduced the time where Michael and Holly might talk. In addition, Michael missed a lot of school as both he and his wife experienced some health issues, and Michael frequently went to professional development or took "personal leave" to work on his National Board Certification leaving Holly to "sub" for his classes.

State's *Teacher Education Faculty*

Field Instructors. At State, university supervisors were called field instructors indicating their unique (within State's structure) position in the school placement sites. Field instructors historically had been drawn from two groups: retired teachers from the area and doctoral students at State. Duties I observed field instructors complete included observing interns teach lessons on a bi-weekly basis, providing written and verbal feedback on those lessons, providing suggestions, tips, and encouragement to interns (primarily through email), coordinating formal evaluations with the cooperating teacher, and updating State faculty on interns' progress, especially when interns were having problems.

Two field instructors participated in this study: Sam and Hee-Sun. Sam supervised students at Quincy High (and several other schools) including Kimberly and Holly while Hee-Sun supervised Tammy and Chad at Randolph High and Heather and Cindy at Vincent High as well as two other interns. Sam was a first-year student in the doctoral program after having taught middle and high school science for nine years. His varied experiences included teaching in both urban and more suburban schools as well as a brief stint in private schools. While Sam's role as field instructor meant that he was representing the university's perspective in the schools, he admitted that he was often learning that perspective as he went. Less than a month after starting at State, he was in schools as a field instructor.

Hee-Sun was a third-year doctoral student in State's program, but like Sam, was a first time field instructor. Because Hee-Sun's teaching experience had been in Korea rather than in U.S. schools (six years at a variety of levels), State required her to participate in a year of training and mentoring prior to becoming a field instructor. In the year before the study, Hee-Sun had shadowed another field instructor through much of the year, going to schools to observe and meeting with interns and mentors. In addition, she participated in a weekly seminar for doctoral students who were participating in teacher education. As a result, Hee-Sun had a very strong sense about State's priorities and emphases and she viewed conveying and articulating those to interns and mentors as central to her job.

Course Instructors. Interns took two courses during the internship: TE Science and TE Professional. All six interns in the study were enrolled in the same TE Science course led by Rosa, a tenured faculty member at State. When State still used a

Professional Development School (PDS) format, Rosa spent several years teaching biology part-time at RHS where she had been central in developing the curriculum that was still in place. Rosa's was a scientist and the transition from science to science education had been a gradual one. Rosa had also been one of the methods instructors the previous year for this same group of students; the interns knew her well and the course was designed to be a continuation of the previous year. This cohort of interns made the eighth that she had followed through the two-year cycle. Rosa had collaborated with several colleagues on the development of the program, and while faculty continued to tinker with the course sequence, they had hammered out a lot of the curriculum, which is spiral in nature: "There really isn't much new content in the TE Science course," she said, "as much as it is a refining of what we did last year and working on helping them implement that in schools."

The TE Professional course had many sections, and interns were assigned a section based on the characteristics of their schools. RHS, given its tight connection to State, had enough interns placed at it to warrant its own section taught by Sandy. Sandy had been an English (and occasionally social studies) teacher for close to 15 years in a number of private and public schools. However, State had been her home for the last 20 years where she served as an academic staff member, filling many of the administrative roles associated with field placements as well as regularly teaching the TE Professional course and other courses as needed. She did not know the interns placed at Randolph personally prior to the year beginning. Interns at VHS were placed in a section with students from other suburban schools in the area. Cathleen, an assistant professor at State taught this section. Cathleen's experience as a teacher was in home economics, but she

also spent five years leading family education programs in the community before returning to graduate school. Cathleen had not taught TE Professional before and she admitted that it was at times a struggle for her to determine just what the course was supposed to be about. All the interns in urban high schools, including Quincy, were placed in a section with Will, a doctoral student as State. Will had been a middle school mathematics teacher for nine years before becoming a principal. After nine years as principal, he left that position to return to graduate school. As with Cathleen, this was Will's first time teaching TE Professional. The course, as designed, intended to assist interns in managing the professional responsibilities associated with teaching. This was accomplished through a case-based curriculum in which interns were expected to bring their experiences in the field to bear on the course discussions, readings, and assignments.

Limitations of the Study

Given the methods and context of this study, there are limitations that deserve attention before I turn to the findings in the following chapters. Following Geertz (1992), I will describe these limitations (or simply limits in Geertz' view) as arising from two major components of ethnographic work: positionality and circumstantiality.

Positionality

I write as a 35-year old Caucasian male who spent nine years as an urban high school science teacher. As a twenty-one year old, I was a teaching intern in a program structured similarly to State's program, and, once a full-time teacher, acted as a cooperating teacher or mentor to over ten student teachers and interns from a variety of university-based teacher education programs. Furthermore, while a graduate student, I played the role of teacher educator in State's program, teaching methods courses at both

the internship and senior-year level. In the year prior to the study, I taught the senior-year course with Rosa (the TE Science instructor described above); all six of the interns in the study were students in our class. I knew each intern well, though I worked most closely with Heather, Holly, Chad, and Kimberly because they majored in a physical science, my area of specialization. When I approached the interns about participating in the study, I was not an outside researcher coming in to study their internship; I was Jeff, their teacher. Likewise, they were not subjects, but my students for whom I had already begun to assess their strengths, weaknesses, personalities, and quirks. In addition, though I did not select them for this reason, I had affection for each intern before the year even began—an affection that only grew as I followed them through a formative year in their lives.

I disclose this for two reasons. First, I disclose my insider positionality—I do not intend to write with "views from nowhere" (Geertz, 1992, p. 132). To the degree that the findings I report here read as such, it is a weakness of my writing rather than a methodological decision. I knew and was known by State's program and by the interns before this study began and I approached the study with a relatively large amount of experience working with science teachers, old and new. Second, and related given my insider perspective, a great challenge of this work was "to apprehend as strange" contexts and situations in which I had a spent a great deal of time (Latour & Woolgar, 1986, p. 29). High school science classrooms, teacher lunchrooms, university teacher education classrooms—these were all situations I knew well. As a result, I made an effort, especially early in my field work, to try to observe with fresh eyes the situations I was in and my fieldnotes reflected an effort to portray the context I was in as close to the situation as possible with as few "school" terms as possible (Emerson, Fretz, & Shaw,

1995). These attempts, of course, do not separate me from my previous experience which no doubt limited how strange classrooms of any kind might appear to me.

Circumstantiality

In addition to my position in the study, I also describe some of the characteristics of the situation and program under study that place limits on the study's findings. I do not intend to argue that the findings presented here apply equally well across all student teaching contexts; the study reported is the case of one program and six interns at three different schools.

The program under study had several important characteristics that may be particularly relevant to the findings. First, State is a research institution in which teacher educators are expected to also be educational researchers. This is not always the case as many, if not most, preservice teachers are certified at universities where faculty are primarily teachers with fewer research commitments (Levine, 2006). Second, State's program includes a full year in the field under the supervision of one cooperating teacher. This, too, varies from some programs that include either lesser amounts of time in the field or a movement between several mentoring teachers. As I will report in Chapter 3, the mentoring teachers in this program come to exert a great deal of influence on the intern, and it is fair to ask whether that influence may be, in part, structured into the program due to the large amount of time interns spend with a single mentor. Finally, the study documented a full year in the life of an intern who spent at least four days a week in schools and only one day a week at the university. It does not capture the four years before the internship in which interns' lives were dominated by university coursework rather than field experiences. It also does not follow interns into their teaching careers as

they completely leave teacher education and teach full-time in the schools. In this way, the study captures only what occurs during this unique period of time in an intern's life, not the full relationship between universities, schools, and beginning teachers.

Given a sample size of just six teachers (and their six cooperating teachers), the sample assuredly does not fully represent the population of all student teachers. In this case, five of the six interns were Caucasian (with one Asian-American), and five of the six interns were females. Five of the six cooperating teachers were Caucasian (with one Asian-American) and four of the six mentors were males. No Latino/as or African Americans were in either group. While the sample generally matches the student and teacher population of State's program, it does not necessarily match the population across the country and may limit the findings.

Finally, while the schools were selected to increase socioeconomic diversity, the three schools were all located within 10 miles of one another in a smaller city in a Midwestern state. While the student populations varied at the schools and represented urban and suburban schools, they do not capture the diversity of schools and students that might be found more widely.

To summarize, the study of this program, these interns and the people that worked with them, and these schools does not intend to describe "every" program, intern or school, but is instead just a concrete description of a particular time and place (Geertz, 1992). Borrowing from Geertz (1992) again, however, it is my hope that "just trying to figure out" this particular circumstance "is not chopped liver" (p. 132).

Chapter 3
The Use of Mentors' Scripts and Patterns in Shaping Interns' Practices and Beliefs

The six interns' stories of their year are in many ways unique to their personalities, their contexts, their mentors, and their students. Even from the brief descriptions in Chapter 2, it is easy to see the uniqueness of each intern's circumstances. Despite those idiosyncrasies, when viewing interns through the lens of Korthagen's (2004) onion model (See Figure 1.3), patterns of change exist across the interns in both their more outer levels (like enacted teaching practice and skills) and inner levels (like their beliefs and visions of good teaching).

Initially, all six engaged in an early period of "Using the Mentor's Script." Interns used their mentors' performances, witnessed earlier in the day, as the source of their own performances with a later class. This following of a script could be literal or metaphoric; some interns took copious notes as their mentor teachers taught and then used those notes as a guide, while other interns relied on their memory. In either case, interns imitated their mentors' performance.

Once the scripting stage had ended, all six interns entered the stage of "following mentor's patterns." Teacher education program requirements eventually prevented interns from observing their mentor teach prior to their own teaching; their script was removed. However, as interns planned, enacted lessons, and related with students, they faithfully tried to "channel" what they had seen their mentor do for the first few months of school. Mentors generally had one or two instructional approaches—moves, strategies, or activities they used on an almost daily basis—as well as relational ones—ways of interacting with students, again, on an almost daily basis. These approaches served as the backbone of the interns' more independent practice.

However, during this second stage, interns' experiences began to diverge. One group of four interns, which I call "reproducers," experienced a great deal of success during the "following the patterns" stage. Reproducers continued replicating their mentors' approaches and, in doing so, got consistently good feedback from those around them—their mentors, field instructors, and students. Over time, interns grew increasingly comfortable with these approaches and used them frequently and consistently throughout the internship, even during the final lead teaching period in which most mentors stopped helping interns plan and were no longer present in the classroom. In addition, when interns talked about their practice and their visions for teaching, they increasingly included aspects of their mentors' practices and visions. To some degree, it appeared that the mentor had spawned another teacher who shared many of the same characteristics. The reproducers, in addition, were viewed as the most successful of the interns by all stakeholders involved; this is true despite the fact that their end practices and visions varied widely and may or may not have reflected the components of good teaching promoted by State's teacher education program.

The second group of interns, which I will call the "strugglers," also faithfully tried to reproduce their mentors' approaches in their own teaching. Unlike the reproducers, however, they struggled—a struggle that was readily apparent to all involved including the intern. Despite the lack of success using their mentors' approaches and despite a multitude of alternatives suggested by their mentors, field instructors, and course instructors, the strugglers forged ahead in following their mentors' examples, rarely trying anything that they had not seen their mentor do. This was not a case of these interns simply having poorer examples to follow; the strugglers' mentors were

experienced teachers, experienced mentors, and had developed practices that worked well for them. In the end, the strugglers, and their internship experience, were viewed as unsuccessful to a certain degree, certainly when compared to the reproducers. Unlike the reproducers, however, the strugglers' visions of good teaching did not move toward their mentors, nor did they remain the same throughout the year. Instead, the strugglers appeared to have an uncommitted vision of what good teaching should look like—one much less coherent and certain than those of the reproducers.

My goal in this chapter is to trace this narrative arc. I begin by demonstrating how the interns early on clutched tightly to the instructional scripts of their mentor teachers. Following that, I describe each group's trajectory in their attempts to follow the patterns of the mentors.

Using the Script

All the interns began the year tightly following the script set out for them by their mentors. Interns re-enacted mentors' lessons by attempting to replicate the lesson they had witnessed their mentor teach. This included bigger picture items like lesson activities, materials, and the agenda for the day. It also included the details as interns borrowed mentors' representations, examples, or anecdotes. Like Sundli (2007), who found that "students did not just copy the mentor's working patterns, but also mimicked body-language—gestures, for instance" (p. 209), I too saw interns mimic their mentors' use of body and voice, sometimes effectively and sometimes quite awkwardly.

In Sundli's (2007) description of her student teachers' "copying," it is not clear whether students are actually replicating what they have seen their mentors do or are following the patterns they gleaned from observing their mentors over time. Here, I am

making the distinction. In this first stage—"using the script" (which generally lasted between a month and two months)—interns' copying of patterns and mimicking came immediately on the heels of watching their mentors and was an attempt to replicate the lesson they had just witnessed, albeit with a new group of students.

The copying and mimicking is not particularly surprising given the structure of State's internship. For all six interns, the selection of their focal class explicitly involved the calculation that it came after one of their mentors' classes, thus providing interns with an example to follow. No intern began the year expected to teach a class that did not have an example class taught by their mentor preceding it. For example, Frank taught general chemistry 1st, 3rd, and 5th hours and advanced placement chemistry 2nd hour. As a result, Chad and Frank decided that 3rd hour would be Chad's focal class because he could watch Frank teach 1st hour and then have 2nd hour free (because Chad was not going to teach AP chemistry) to get himself ready to teach general chemistry. Other intern/mentor pairs made similar decisions.

The Re-enactment of Lesson Structures: Performance and Pitfalls

During this first month or so, interns and mentors would discuss the lesson to be taught, usually the afternoon before, but the mentor was primarily responsible for planning; lessons used mentors' materials and activities, and mentors decided what was to be taught. Depending on the intern/mentor pair, the intern might have more or less input into making small changes about what she or he might do, but, regardless, the lesson was primarily the mentor's. During the mentors' teaching of the lesson, interns would carefully observe the mentors' performances. For some, "scripting" was literal. Chad and Tammy sat in the back of the room and wrote notes as the class unfolded.

Tammy's took the form of note-taking; she had a paper copy of her lesson plan, written during her discussion with Vince the day before, and would fill in the details around that template based on what she saw. For example, when Vince added a step to a lab procedure that they had not discussed, Tammy wrote that step in the margins of the plan. Chad's scripting, however, had a more frantic quality. He would start with a blank legal pad and try to capture every detail, every comment Frank made, every example Frank used, every drawing Frank drew before it disappeared from his memory. When it came time to teach, Chad did so with his legal pad right in front of him. The other interns did not write a literal script, but watched closely enough, and then used the same materials (e.g., PowerPoint slides, handouts, etc.), that the lesson they taught had a re-enacted quality to it.

This does not mean, perhaps obviously, that the lesson taught by the interns looked exactly like their mentors'. A common complaint among interns was that "my lessons go more quickly than my mentor's," which meant that they completed the lesson with time in the period left over. While the lesson structure might have been the same, interns tended to move through things more quickly, primarily because they did much less extemporaneous talking than their mentors which might be difficult to script. For example, a pre-lab discussion of an activity about the breathing of yeast cells from the third week of school took Vince 12 minutes to complete. It included several parts: 1) listing and describing on the overhead projector the five parts of the lab report and giving students hints about what they might include. (9 minutes), 2) reminding students what they should do when they get back to their lab stations (2 minutes), and 3) explaining clean-up procedures (1 minute). Tammy's discussion took 5 minutes though it included

all of the same parts. For example, during the description of the parts of the lab, Vince included many more opportunities for students to answer or contribute to the description that Vince was writing on the overhead. Tammy on the other hand, limited student input and ended up using Vince's writing word-for-word, even though Vince's description included language his students had contributed. In the clean-up procedure portion, Vince took a full minute to explain what cleaning up would entail: rinsing the test tubes thoroughly, including how to use the test tube brush, taking the labeling tape off the tubes, where and how to store the cleaned test tubes, and directions on what to do after clean-up. Tammy's clean-up portion included seventeen words, "When you are finished collecting data, clean the test tubes and then come back to your seats." This pattern repeated itself over and over; an intern would follow the mentor's lesson plan, use the same activities or worksheet, lecture from the same PowerPoint slides, or give similar directions. Most often, the intern's explanations were briefer, less developed, delivered at a pace that was both quicker and less open to students' participation.

At times, students' ability to de-rail instruction provided an additional reason why interns' lessons looked different from the mentors'. For example, Chad was following Frank's lesson structure in which he had three students come to the board to write an electron configuration for a variety of atoms. Frank had students compare the configurations, find any differences, and then he provided some guidance to students who had a detail wrong. Chad's instantiation began the same way—he called for three volunteers. But unlike in Frank's class where three students quickly rose and went to the board, only one volunteer emerged. After some cajoling, Chad eventually selected two more student names from his class roster, but these unenthusiastic participants

approached the board slowly and borrowed heavily from the first volunteer's work. When it came time for the second set of three, a student initiated a negotiation: "Can't we do three different ones rather than all do the same?" Chad ignored his request and said instead to the class "Don't you want to do this?" When no one responded, he selected Jade from his class list. Jade quietly said, "No." Chad responded with "Yep, you're going to." Her friend, Katie, mocked Chad, "Yep, you're going to." When Jade eventually made it to the board, she simply stood and waited for her friends to tell her what to write. While the structures of Frank's and Chad's lessons were the same, Chad's inability to garner cooperation from his students made the execution look quite different, exposing—painfully for Chad—the invisible interdependence of teachers on their students.

Interns' Use of Mentors' Instructional Representations

In addition to lesson structures, interns copied other aspects of mentors' performances, including the use of examples, representations, and, in some cases, jokes or personal anecdotes. During this scripting phase, interns would use the same examples to illustrate a point that they saw their mentors use. For example, when Shannon (Cindy's mentor) was explaining the movement of water through the cell membrane, she emphasized a way for students to remember water's path: "Remember, the water always moves toward the solute." When Cindy taught, she used the same phrase, word-for word, even emphasizing it more than Shannon by repeating it several times. When mentors used a drawing, or an outline of ideas, or definitions of key terms, interns were sure to use them as well. On occasion, especially when mentors' examples seemed more extemporaneous, interns would attempt to copy, but the example might fall flat. For example, in an early class, Ken was discussing a problem from students' worksheets that

read: "Which is a larger atom, carbon or nitrogen? Why?" Ken pointed out that this question had "tricky wording" because:

> you have to figure out if the question is asking about atomic radii or nuclear charge. The answer might be different depending on what you are asking. That's why we emphasize reading carefully on things like the ACT test, because figuring out what the question is asking is important.

He then, seemingly off-the-cuff, pontificated about how studies have found the greatest correlation with ACT science scores is with reading skill. When Heather reached this example during her class, she pointed the question out by saying "this is a tricky one" and told students "that it is really important for you to pay careful attention when you are taking tests like the ACT, because reading is the most important skill for tests like those." What she left out was any discussion of the multiple meanings of the word "larger" in a chemical sense, which is the point that led to Ken's discussion of reading and test taking. In this example, Ken's teacher-initiated intrusion (Kauchak & Eggan, 1993) might have had the effect of distracting his intern as well as his students from the larger point, leading Heather to attempt to follow his script but emphasize the tangent rather than the content.

Jokes and personal anecdotes were replicated as well, again sometimes with a different effect than when the mentor used it. When Frank (Chad's mentor) ran through the names of the elements on the periodic table, he had a joke for each one (e.g., "when you spell fluorine, don't spell it F L O U R, because that would be Flower-ine—not the same thing"). The jokes were groaners and both Frank and his students knew it. He even moaned himself and would say things "Oh, Dack (Frank's last name), you're killing me" in a faux-student voice. But the students loved it, laughing, eye-rolling, and glancing at each other in just the right places. When Chad told it, the language was similar—"and

with fluorine, it's F L U O R -ine, not Flower-ine." But students did not perceive this as funny, perhaps because Chad was nervous and did not smile as he said it. After no one laughed, Chad added for effect, "This is important to know. Teachers will get on you about this. Even students in college spell it wrong and the teachers would yell at them. They get meaner as you go higher up." While Chad's last line reads funny (at least to me), Chad delivered it sternly, as a warning lest his students forget what he had told them.

Interns were aware of the support that following their mentors' script provided to them as well as the challenges that came with it. During a debriefing session in a TE Professional class after the first guided lead teaching period had ended, several interns nominated the sentence "how hard it is to teach when I can't watch my mentor teach" as the most important thing they learned. In a different TE class, one intern shared as an example of her personal growth "that I got much better at thinking on my feet once I couldn't watch Ken teach anymore." Interns also acknowledged publicly the issues created when following the script. A group of interns complained about the requirement in their TE Science course that they plan units several weeks in advance. "It's a farce," one said, "my mentor doesn't know what he is doing two or three days ahead. So I write this plan, and end up not doing any of it." Many of the interns listening agreed with his assessment. Another intern complained in the second week of the internship that her mentor did not give her the information she needed; "I'll say, 'how are we teaching this?' And he'll say, 'we'll talk through it.' That's just not enough for me."

Mentors were well aware of the mirroring of their practices by the interns. In a meeting in October, a group of the mentors laughed about how strange it was to see

themselves reflected back when they watched their intern. One commented (to much knowing laughter) "how weird it is to see carbon copies of myself teach . . . Oh my God, that is the same example I gave. This is the same joke I used." In the most extreme version of mimicking instructional represntations, Tammy even adopted her mentor's personal life; she described how her lactose intolerant sister used to eat ice cream and then throw it up, except it was not her sister—it was Vince's. When I asked Vince about that instance, he said:

> Well, to be honest, I bet I probably did something like that (when I was an intern) . . . They hear us tell a story and they think, "That's how I fill this minute." Because, early on, I think for them it's just about filling the time and they're like, "Oh crap, I got 73 minutes, I've got to know what to do every minute. And so, he told a story here, I've got to tell that story at the same time when I teach this," and they don't have some of those stories or they don't think they do.

Vince sees Tammy's behavior as reasonable for a beginning intern, and his description of interns' thinking about filling time seems a sensible explanation, consistent with the literature (Feiman-Nemser & Buchmann, 1985). Indeed, as we move from the first step of the model (using the script) to the second step (following the patterns) and interns move into their second or third month of the internship, these sorts of mimicking behaviors almost disappear, though the dominant influence of the mentors' practices remains.

Following Mentors' Patterns

State's teacher preparation program structure involves two "guided lead teaching" periods in the fall semester. In these periods, intern moved from being responsible (i.e., "the teacher") in one class to two or three classes, depending on their placement school's schedule. During the second lead teach period (generally in November or December), all of the study's interns, with some push from their field instructors, took on a schedule where they no longer had an early class taught by their mentor to follow. This meant that

"following the script" was no longer possible, because no matter how much help they might receive from their mentors in planning, interns would not have witnessed an enactment to replicate. Even when this second guided lead teaching ended and they might again have a class to copy, I did not detect the degree of mimicry I did during the "using the script" stage. Instead, a new pattern emerged among interns in which they attempted to "follow the patterns" mentors had established for their classroom.

In order to characterize the mentors' practices, I used the cross-sectional slices of inquiry and classroom management. However, inquiry proved to be too narrow in this case, particularly because many of the interns and mentors rarely used any version of inquiry in their teaching. As a result, I broadened inquiry to include all aspects related to science instruction—content, classroom activities, or lesson structures. Classroom management, as described before, includes the relational aspects of interacting with students as well as issues of student discipline and behavior. I analyzed each instance in which I witnessed the mentor's instruction, ranging from as few as 5 instances (in the case of Michael) to 10 (in the case of Vince). In addition, I used the mentors' description of their own teaching from the opening interviews, as well as interns' descriptions of their mentors' teaching from interviews to corroborate my field notes and to seek out more infrequently occurring emphases that might still be considered an important part of the mentors' practice (see Table 3.1 for a summary of patterns in mentors' practice). Observed patterns are those features of the mentors' practice that I witnessed in over half of the lessons observed (though often it was in every lesson). Described patterns are those aspects of practice that mentors' described as being central and were confirmed by the interns' description in later interviews.

There was considerable diversity in the mentors' practice. Bonnie, for example, strongly emphasized order, routines, and organization both in her instruction (e.g., an emphasis on thinking and problem-solving) and in her relationships with students (e.g., routines and procedures) while Vince had a much more laid-back approach that emphasized student-initiated inquiry in instruction and a highly relational (not structural) approach to classroom management. Some mentors' practice matched more closely with the approaches promoted in State's teacher education program. To return to the Bonnie and Vince contrast, Vince used "inquiry" (frequently promoted by State teacher educators) to teach biology, while Bonnie sarcastically commented that "it works great if you have a whole class of kids who like to do jigsaw puzzles"; the field instructor working with Vince said that, "it was great that Tammy got to see inquiry in action"; the field instructor working with Bonnie felt it necessary to strategize with Kimberly about how to work inquiry into her plans since it went against Bonnie's normal instruction. What this diversity means is that as I describe how interns converge around their mentors' practice, it does not mean that they are converging around *a* teaching practice.

Table 3.1. Mentors' Instructional and Relational Patterns

Mentor (Intern)	Instructional Patterns		Relational Patterns	
	Observed	Described	Observed	Described
Bonnie (Kimberly)	1. Never telling students the answers. 2. Group-Work	1. Developing thinking and organizational skills 2. Group-work	1. Reinforcing routines and procedures 2. Giving students choices	1. Establishing routines and procedures 2. Keeping students in class ("Handling my own problems")
Vince (Tammy)	1. Group-work 2. Inquiry-oriented labs and cases	1. "Putting learning in students' hands" 2. Inquiry	Interactions with students that begin with the personal	1. Getting to know students personally 2. Leveraging relationships to motivate students
Ken (Heather)	1. Explicitly addressing standards/learning objectives 2. Cooperative learning structures for quick student discussions	1. Focus on learning objectives 2. Clear expectations and outcomes	Reinforced routines and procedures	1. Routines and procedures/Wong's "First Days of School" 2. Using every minute for instruction
Michael (Holly)	Teacher and student problem-solving	Conceptual understanding rather than "plug-n-chug"	1. One-on-one personal relationship-building with students 2. Removing uncooperative students to administrator	1. Building rapport with students 2. Discipline is "priority number one"
Frank (Chad)	Teacher and student problem-solving	1. Helping students become problem solvers 2. Thinking one one's feet	Energy, enthusiasm, and charisma	1. Establishing a "classroom presence" 2. Occasional "scream and rant and rave"
Shannon (Cindy)	1. Note-taking from creatively animated PowerPoints 2. Oral quizzing on vocabulary	1. Keeping things interesting through variety 2. Adapting assessment for students with special needs	1. Silly and playful persona 2. Strictly enforced routines, procedures, and rules	1. Organized class—"everything has a place and time" 2. Actively using proximity

The Reproducers

Kimberly and Bonnie. I'll begin by exploring the case of Kimberly and her mentor, Bonnie. Bonnie believes her reputation among students at Quincy High is secure:

> The kids will tell you that I am incredibly demanding. I expect them to work hard. I will bend over backwards to help them work hard but I'm not going to hand it to them. And that's what I enjoy. I am excited about teaching kids how to learn, how to find answers. Most of my students will never use chemistry directly the rest of their lives but they will use problem solving skills. They will use organization skills.

When Bonnie taught, she emphasized helping students find or develop answers themselves. Questions by students (e.g., "Which number do we use for the conversion factor?") were *always* answered with another question in an attempt to guide students to answers (e.g., "What do our conversion factors tell us?") or point them to resources they should be using (e.g., "Where do we find information like that?"). For Bonnie, this habit closely connected to her classroom management style, where she "focuses on helping kids take responsibility for themselves." The first week of school focused almost exclusively on routines and procedures, and consistently throughout the year, Bonnie, with extraordinary discipline, never wavered on those. When students asked her to borrow a pencil, or where to get an extra worksheet they had misplaced, Bonnie would simply look in the direction of the room where a student might find the solution or return students to the list of procedures she had them tape to the front of their notebook during the first week of school. Kimberly followed this script faithfully but admitted to Bonnie that it was hard: "Part of me just wants to give them the papers – 'Here you go, let's get started on the lesson.'" Bonnie replied, "But every time (you do), you enable this pattern of behavior. I'm confident that every kid can do this, and that's where we set our expectation."

However, once Kimberly was responsible for all of Bonnie's chemistry classes and no longer had Bonnie's example class to imitate, Kimberly continued to implement

Bonnie's patterns with fidelity. Bonnie's pattern of questioning did not come easily to Kimberly:

> I hated this at first, when I first saw my mentor teacher do this . . . because I was like, "Gosh, that was so annoying as a student," but asking questions when they have a question for you, just to get them thinking about what is it they're trying to find out and leading them towards those steps versus saying 'this is how you get there.'

Kimberly felt, based on her personality, that she might be more nurturing than Bonnie and that "being tough" was not something she was inclined to do naturally. Despite those initial reservations, Kimberly quickly came to admire Bonnie's commitment to making students think. By January, Kimberly's vision of good science teaching had but one component:

> I think it is very important for good teachers to—or for teachers in order to be good teachers—to encourage their students to think on their own. I think very often students are used to their teachers doing the thinking for them and so they're used to going through the motions and so they're not used to thinking on their own. For example at the beginning of the year, I had several students constantly raising (their hands) "Is this right? Is this right? Is this answer right?" . . . I think, starting from elementary school, these students are used to their teachers going, "Yep, that's right, that's right, that's right," and so they have that affirmation from their teachers that this is the right answer and I think it's really important that teachers kind of help or push their students out of that pattern. I think good teaching, to put it simply, is encouraging your students to think and facilitating an environment and a lesson plan that does that.

She repeated this idea—even more firmly—in the final interview.

In class, Kimberly, just like Bonnie, followed questions with questions and emphasized students taking responsibility for finding their own answers. During a lab in which students were investigating the factors that affect solubility, one group (comparing rates of solubility in different volumes of water) complained to Kimberly that they should be able to use hot water.

Kimberly: "Well, what would that do?"

Student: "Well, it would make it go faster."
Kimberly: "Is that a good thing?"
Student: "I think so – we won't have to keep stirring so much."
Kimberly: "What does that do for our question? Which factors are we looking at here? What happens if we start changing multiple things?"
Student: (realizing the implication of the question):"But it's going to take us forever!"

Kimberly smiled and moved onto the next group. In most cases, just like Bonnie, Kimberly's interaction with students involved only questions until students reached a conclusion that she deemed satisfactory.

Kimberly also emphasized the same routines and procedures as Bonnie and attempted to be as faithful in requiring students to follow them. During Kimberly's lead teaching, I did not observe any new routines that she created, nor did I see any instances where she dropped routines that Bonnie had begun. Class was managed in similar ways with Kimberly in charge, though Kimberly's lack of expertise led to things running less smoothly at times. At Quincy High, cell phones were ubiquitous despite a school policy (placarded on every hall) that banned them. In any place besides Bonnie's class, I frequently saw students calling and "text-ing" in front of teachers without consequences. In Bonnie's class, however, the rule was enforced firmly. I witnessed many occasions where a phone would ring, Bonnie would walk to the offending student, put her hand out, and the student would give her the phone. On the occasions where students would argue with her (about half the time), she would quietly and calmly give them a choice: "You can either give me the phone and get it back after school or I send you to Mrs. Schwimmer – you decide." Students would give her the phone, pout for awhile, but class continued quickly. On one occasion early in Kimberly's lead teaching, the phone of one of her more behaviorally challenging students rang. Bonnie was not in class, and

Kimberly hesitated for several beats—long enough for the student to shut it off and shove it in his backpack—but eventually confronted him with the same set of choices—turn the phone over or go to the administrator. The situation was not quickly resolved as the student spent more than five minutes wandering around class deciding what to do, and Kimberly was visibly upset and angry. But she finally got the phone and frequently used the story of this occurrence as an example of her "figuring out how to give kids choices," rather than exacting punishments. Later in the year, another student's cell phone rang and it was turned over without incident.

By the end of Kimberly's lead teaching, class ran smoothly using Bonnie's instructional strategies and relational techniques with or without Bonnie's presence. When Kimberly described her vision of good teaching and good classroom management, she described Bonnie. When she evaluated her own teaching, her progress was toward Bonnie's practice. For example, she said "But I think second semester, I felt more comfortable, like this isn't really me trying to push power on this kid, but it's more of 'let's have a conversation' and hopefully help him realize or her realize how their actions are affecting me and the class, and kind of approaching it that way"—a description that sounds remarkably like Bonnie's emphasis on helping students learn to be responsible citizens. Bonnie, too, saw the change in Kimberly over the year and would evaluate her progress by the degree to which she moved toward Bonnie's practice. In Bonnie's view, Kimberly was an outstanding intern, the best of many she had worked with. Bonnie viewed Kimberly as responsible, conscientious, dedicated, and reflective—all characteristics that she credited Kimberly as bringing to the internship. In evaluating her

teaching however, "improvement" meant movement toward Bonnie's instructional and relational emphases:

> (Kimberly's classroom management) has improved dramatically over the course of the year. She was initially willing to deal with almost anything that went on, on an individual basis rather than establishing routines. And while that can be easy initially, it doesn't get any easier as the year progresses without teaching your students those routines. And she saw the difference between modeling the routines with the students and holding them to them consistently. . . .We were talking about this the other day for a symbol quiz - and we're on the 25th symbol, we've done this 25 times, all I have to say up there now is "symbol quiz" and they know that five seconds after the bell rings, we're going to count down - that their time starts. If they're still talking, we just don't turn on the overhead. In the beginning of the year it would take them two minutes to get to the point where everybody had a piece of paper. But teaching and reinforcing those basic routines—how important that is to freeing up class time for content.

Likewise, Bonnie described Kimberly's progress in teaching content by noting how by the end of the year she was regularly:

> challenging students with questions when they ask questions as opposed to just giving them the answer and moving on. And that's something she has practiced this year. Because she initially started off (allowing), "Miss Sui, how do you do this?" Which just encourages kids: "Miss Sui, how do you do this?" "Miss Sui, how do you do this?" And after the first couple weeks of running ragged, she saw the value in—although it was going to be a long process, it wasn't going to happen in a week, or two weeks, or three months—encouraging kids to find their own answers. And that's a piece that . . . definitely came from my style of teaching.

Sam, Kimberly's field instructor, also thought highly of her. From his perspective, her internship "had gone very well" and she made great strides, especially in confidence, classroom management, and ability to relate to urban students. When asked to identify a weakness in her teaching, he could not, though he noted that "she struggled some in meeting expectations in her (teacher education) coursework, but in the classroom, I think she was always on top of things." Sam's final evaluation of Kimberly was very positive even though he recognized that Kimberly's teaching did not always match the normative

view of the teacher education program. He attributed this to Bonnie and did not seem to hold Kimberly accountable. Sam hoped that Kimberly, going forward, might "want to try some more ambitious teaching" once "some of the constraints" of her internship were removed, rather than the emphasis (in his view, negative) on "building skills in urban students" that he found pervasive in Bonnie's classroom.

Kimberly and Bonnie exemplify the experience of the reproducers. Reproducers, like all the interns in the study, followed their mentors' script. Once following a script was no longer possible, reproducers followed their mentors' patterns, both instructionally and relationally. When they did use these patterns, they, of course, struggled at times, (as we saw in Kimberly's cell phone confrontation) but before long—and this is unique to reproducers—they began to feel good about how the class was running and their mentors and field instructors gave them positive feedback about their progress. By the end of the year, reproducers talked about their visions of good teaching and the kind of teacher they are in terms that sound much like their mentor. Kimberly, despite her initial negative reaction to Bonnie's style, began to view good teaching as being about "getting students to think," echoing Bonnie's goal of "teaching students to learn." To that end, both emphasized an instructional style that involved answering students' questions with questions, until students arrived at an answer. When Kimberly talked in her interview before the internship, she emphasized ideas like respecting and caring about students, both personally and academically as well as "developing kids' self-awareness and self-growth." While these ideas would not have garnered disagreement from Bonnie (Bonnie was always respectful to students and cared deeply about them, despite her tough demeanor), Kimberly's language shifted away from "care" and "respect" when

describing her teaching and good teaching. Kimberly admitted being initially put-off by Bonnie's approach with students because it seemed to be too harsh or too demanding. Yet, Kimberly's practice became remarkably like Bonnie's, even following the same patterns of questioning she initially found annoying.

A final characteristic of reproducers is that the internships are viewed by those involved as being generally successful, as ones where whatever should be happening in internships seems to be occurring. Bonnie thought Kimberly progressed exceptionally well, Kimberly raved about Bonnie and how much she learned, and Sam thought things went well, even as he harbored reservations about the practices he witnessed. In the end, these interns taught like their mentors and made a corresponding shift in their thinking about teaching and about themselves as teachers toward their mentors.

Three other interns, Tammy, Heather, and Cindy also followed this reproducing pattern. I'll describe Tammy's story next, followed by a briefer summary of Heather's. Cindy's case, while I classify it as a story of reproduction, presents several problems to the model that I will discuss.

Tammy and Vince. Tammy's mentor, Vince, had very different emphases than Bonnie. While Bonnie was skeptical of inquiry (recall her jigsaw comment), Vince emphasized it and the group work that typically comes along with it. His biology course was organized around a series of case studies developed by Randolph High faculty and State science education professors many years ago. In one case, students were given a story of an outbreak of sickness. Over the course of three weeks, students uncover, through labs and other activities, the information they need to determine the source of the outbreak (cholera) as well as the key characteristics of cells. A normal day began with a

teacher-led discussion of the previous day's work, an overview of the lab or activity for the day, group-work in which students collected, analyzed, or reported on data, and a summary time where students made their findings public and Vince tried to steer the discussion where he needed it to go. Inquiry, for Vince, meant "putting the responsibility for learning in students' hands," and presenting students with problems where "kids start using their own questions to guide the curriculum."

Relationally, Vince had few routines in his classroom, and did not emphasize them or reinforce them as Bonnie had. Instead Vince emphasized:

> building relationships with kids and . . . that helps me get them comfortable in the classroom and get them, a lot of times, to work for me. . . I'll have them say to me "I wouldn't have done this homework, but I didn't want to let you down." And "I only did this because I knew you had given us this assignment." And I don't strive to have that. I don't want them to have the pressure of letting me down, but these kids that we are spending all this time with, I feel like it would be a bummer if I didn't enjoy being around them. So through that avenue, I think a lot of times I get kids to do work that maybe otherwise they wouldn't.

Vince was perceived by those who worked with him (including Tammy) as being charismatic, with an innate ability to draw students to him. To be sure, Vince had a good sense of humor and enjoyed getting silly with students in ways that might be difficult to imitate. However, he also employed two techniques for establishing relationships with students that Tammy used consistently, even as she moved away from scripting. First, Vince would allow students to be very social with one another in class, even participate in this social interaction, before asking students to work on the assigned task. For example, a group of boys in the back of class were discussing the cars that two of them had recently purchased and were fixing up. The conversation grew increasingly animated and started to draw students from the surrounding tables. Vince walked back to the table, listened in for a few seconds, asked three questions about the boys' new cars, and then

told a story about a car he had driven as a teenager. Students laughed at his story; at that point, Vince said "Hey, why don't we make sure we're getting this lab done too, ok?" Students nodded their heads, the two car-buying boys continued to talk about their cars while they worked, and the rest of the students moved on.

Vince's second technique, used almost every time he interacted with students working in groups (most of the time in his class), was to begin every conversation with a personal question or comment before moving to science. "Hey, how's swimming going Becky?" "Great, I set a PR last night." "That's awesome. (High five.) So, what are you seeing in the scope?" or, walking up to a table with a sniffling nose, "I think my nose cells are making more mucus proteins than they need to." "Alright, science nerd." "Proud of that, actually. So what's going on here?" Some might describe Vince's behavior as clownish. A special education paraprofessional working in the classroom would often grow impatient with Vince (and later Tammy) for letting so much "socialization" go on, but Vince shared with me that, while he knew it sometimes seemed like he was letting things go, he was trying to cultivate a classroom where "kids felt comfortable—actually wanted to be in the classroom."

Tammy's use of Vince's emphases parallels Kimberly's use of Bonnie's. Once her ability to use Vince's script was gone, she continued to use the instructional and relational emphases that Vince had begun the year with, again with less expertise. Tammy continued to use case studies to guide the major units. She did not create any new case studies; rather, she accessed the materials that Vince and other teachers at Randolph had used in previous years, sought guidance on how the lesson had worked in previous years, and made minor modifications before teaching with them. A case study from her

lead teaching period began with students receiving information about "their" babies who had been born with an illness. Through the weeks, students learned the genetics needed to uncover the source of the baby's condition. Her lesson structures, like Vince's, involved establishing some larger problems, directing students in group work, and then wrapping up with discussions where the teacher's role was to synthesize the students' findings.

Relationally, Tammy was perceived by Vince and her field instructor as initially struggling with relationships with students. Vince worried that students might not know that Tammy liked them because of her reserved nature (though to my knowledge, he did not share this concern with Tammy). Her field instructor noted in an observation that Tammy did not smile at her students, and questioned Tammy about this during a lesson debriefing. Tammy, however, did not believe she was struggling in this regard—she was actually quite offended by her field instructor's mention of smiling and Vince reported that he "felt it was a bit out of line." While Kimberly's initial response to Bonnie's style was negative (she found it "annoying"), Tammy did not disapprove of anything Vince did, but her personality did not make for an easy match with Vince's relational approach. His strategies of deflecting social conversations or beginning conversations with personal comments required him to be able to think quickly and relate to students easily and often. Tammy admitted, "I don't think on my feet like Vince does." But despite initial struggles, Tammy continued to emphasize Vince's approach and used his strategies. Just like Vince, she allowed a great deal of social interaction and would only step in when it began to get too chaotic. Initially, she was less adept than Vince at stepping into the conversation, and would instead, just stand next to the group talking, wait for a slight break in the conversation, and then direct students back to work. By the end of the internship,

however, she, like Vince, would participate in the social behavior, before getting students back to work. During a lab in which students were measuring their stride length and looking for patterns in the data, the students' running (meant to be for data collection) devolved into a contest over who looked silliest as they ran. Tammy laughed at the students and contributed her vote, even imitating one of the girls who was trying to complete the task in too-high heels. At a lull in the laughing, Tammy said, "OK, let's make sure you get the data. You guys are too silly." In communicating with students individually, she would begin with a non-science conversation. As Rolando (dressed up for the Friday football game) brought a paper to be checked by Tammy, she asked, "Wow, are those snakeskin shoes?" before beginning the discussion of the worksheet. I want to be careful not to oversell the case here; it is not that Tammy became a clone of Vince. Tammy did, for example, create new organizational strategies for students during her lead teaching (e.g., she implemented a class notebook for students to keep notes, handouts, etc.) that Vince admitted he would never have had the organizational skills to pull off. However, for those aspects of instruction and relationships with students that Vince used with great frequency, Tammy overcame her initial difficulties and—by the end of the year—used them often and with greater confidence.

Tammy's visions of good teaching and of her own teaching also made corresponding shifts toward Vince. Instructionally, Tammy's opening views already matched closely with Vince. She initially valued "long-term hands-on projects" that emphasized "inquiry" and "understanding things in depth rather than just memorization,"—ideas that were mentioned often in the teacher education program. Vince's emphasis on inquiry work and case-studies was well-aligned; at the end of the

year Tammy continued to talk about hands-on science and case studies as well as seeking out "multiple ways besides lecture" to engage students with science. Relationally, the shift was dramatic. In the opening interview prior to her work with Vince, Tammy emphasized the importance of "clear rules and consequences" and the "need to follow through consistently with students." During her placement the year before, she had witnessed serious classroom management problems, and was convinced of the need for clear rules and clear consequences, enforced by a fair and impartial arbiter. By the end of the internship, she emphasized relationships with students as the primary source of good classroom management. Just as Vince believed that his relationships with students led to increased cooperation from his students (recall his report of students saying. "I wouldn't have done this homework but I didn't want to let you down"), in the end-of-year interview, Tammy described managing classrooms as "involving establishing relationships" with students that you "can pull on" to gain their cooperation. When needed, she reported saying, "Can you do this just for me?" and having students respond positively. While there are certainly subtle differences in these two stories (i.e., students report the relationship to Vince while Tammy invokes the relationship to gain cooperation), the resonance between Tammy and Vince highlights the ways in which Tammy's vision of good practice moved toward the examples she saw in Vince's classroom. Gone from her description of good teaching or good classroom management was any mention of rules or consequences or fairness; these are replaced by discussion of classroom tone, relationships, and cooperation.

In his final evaluation of Tammy, Vince described her as having made "considerable growth" over the year, and highlighted her ability to manage classrooms,

"maintain student interest and engagement" by designing lessons for various learning styles, and work well with her professional colleagues. It was not necessarily an easy year for Vince; it felt to him "a bit formal. It wasn't like having a buddy in the room." But he was quite confident that "it had been a great learning experience for Tammy" and that she was leaving the internship prepared. Vince still thought that Tammy had more room to grow in building relationships with students, perhaps not surprising given his expertise in that area and Tammy's initial struggles to establish them. Perhaps the best sign of Vince's approval of Tammy's internship is that she was hired for a position at Randolph High (a highly desirable school for teacher candidates), something that certainly would not have occurred had the internship gone poorly in Vince's view. Likewise, Tammy's field instructor completed an entirely positive year-end evaluation, one that highlighted Tammy's ability to design and implement a variety "of labs, demonstration, and scientific investigations" and highlighted Tammy's progress in "working with students" as the area in which she made the greatest progress. In one interview, the field instructor articulated how much she thought Tammy benefitted from working with Vince, a mentor she thought most closely matched the priorities of State's teacher education program. Finally, Tammy had nothing but positive things to say about Vince and her internship. She highlighted her building of relationships with students as a source of greatest strength. She felt very prepared to teach the following year and was anxious to get her own classroom.

Heather and Ken. Heather's internship also followed the reproducing pattern closely, though I will describe it much more briefly. She followed Ken's script during the first month or two of school, though Heather may have contributed to the lessons more

than other interns early in the year. It was often Heather's job to update PowerPoint slides or find a new web simulation for a topic, which she and Ken would then both use in their teaching. However, early in the year, she stayed close to his lead as did Tammy and Kimberly.

Instructionally, Ken used several approaches almost every day. First, Ken daily presented students with the state content objectives to be covered in class. At the beginning of a lesson, he would ask students to "get your objectives out" (a handout he provided at the beginning of every unit), ask students which objectives they had covered, and describe which ones were the goals for the day. Near the end of a unit, he would use the objective sheet to guide review, providing questions that matched each objective and having students self-monitor their progress in meeting them. He described this as "providing clear-cut learning objectives presented to students" as well as a "very clear expectation of what we need to learn." His other daily strategy was using a cooperative learning technique during whole-class instruction in which, when he sensed that students might be confused, he would stop and say, "OK, do a talk with your partner—can we change one element to another?" Students would quickly turn and talk to the person next to them, Ken would monitor the conversations, and then, 30 seconds later, call them back as a group to continue the whole group discussion. I saw him do this as many as 7 times in a lesson and I always saw him do it at least once. He described it to me as "a more recent emphasis, trying to really get kids talking to each other about science." I was always impressed with how smoothly transitions occurred and how much the student conversations stayed on the topic. Little time was lost as students talked, turned around, and then came back to the whole group.

Just as with Kimberly and Tammy, these patterns in Ken's teaching became a major part of Heather's practice. She kept objectives central to each lesson. After a demonstration in which students were determining the reactants and products of a chemical reaction, Heather said. "OK, let's look at objective number 9. Can someone read that for me?" And she also used Ken's technique for getting students talking in every lesson I observed but one (when students were at computer stations for most of the period), though I never saw it used more than three times.

Relationally, Ken was a "big believer" in Harry Wong's *The First Days of School* (Wong & Wong, 1998), particularly in its emphasis on establishing routines and procedures for everything as a preventative strategy for student misbehavior. Heather, though she had not read Wong's book, followed Ken's routines and procedures faithfully. I commented to her once about the degree to which she and Ken did things alike and she noted "Yeah, we noticed that too pretty early on. When I teach one of his classes or he teaches mine, the students don't even miss a beat." Quite early, Heather fully adopted Ken's approach with confidence and skill. I do not have any examples in which she appeared to be awkward or unsure of herself following Ken's patterns. Ken in his opening interview just four weeks into school attributed it to Heather "being so smart, just a really fast learner." By December, however, he was beginning to see it also as a function of "just a really good match," a point Heather echoed when she described the reasons why she did something like him as "something we just had in common, teaching style-wise." Her field instructor, too, believed that the match was a good one—"they just seem like a perfect pair, don't they?" This degree-of-match hypothesis is hard to test, of course, but it reflects the observations that people made (matching mine as a frequent

observer) regarding how much Heather and Ken taught and acted alike, especially in front of the class.

When one looks at Heather's visions of good teaching and classroom management, it is easier to see how the internship experience shaped her, rather than the similarities being simply a result of fortuitous matching. In her initial interview, she described good teaching in terms of "being active" in front of the classroom as well as having students "being active" and "talking to each other" (a point that resonates with Ken's cooperative learning structure). She did not mention objectives nor did she describe anything related to learning goals. However, in the post-interview, she emphasized the importance in good teaching of "have clear expectations for students, both behaviorally and objectives." In her talk about instruction, she highlighted (just as she did in her teaching) the importance of making sure kids knew what they were working towards. Relationally, Heather initially stated that good classroom managers "don't yell," use humor, and are good at noticing things—she thought she also would "use my loud voice" to get students' attention. Absent from that discussion is any mention of structured routines and procedures that Ken emphasized and Heather used. Later in the year she told me she did not really have classroom management problems like other interns because: "we took the approach from day one, that when you walk in you have these things on the board, this is what you get started on, and we get started. They kind of bought in to that, and so we don't have that beginning time where they don't know what is going on, that things start to get out of control"—a quote that might be taken directly from a talk by Harry Wong.

Following the reproducing pattern, Heather's internship was viewed as extremely successful by Ken, Heather, and her field instructor, as well as teacher education faculty. Ken was effusive in his praise for Heather in public settings; at a meeting of mentors and TE faculty in late October, he expressed concern that he felt pressure from the program not to score Heather too highly on her early evaluations. "Look," he said, "I have a ridiculously good intern. I mean she's an A+ as far as I'm concerned" and that should be reflected in her evaluations. He told me later that he found it silly that he needed (as he understood her field instructor's request) to give her lower marks early so that growth could be noted later, because "she's already better than many first or second year teachers that I know." Her field instructor, too, recognized Heather as very strong intern and the internship as having been successful. Her TE Science course instructor was "just really impressed with her. She has all the pieces, really. . . I think she has the potential to be a star."

Cindy and Shannon. Cindy's pattern of progress throughout the year matches well with the other reproducers with one important exception. I will very briefly describe her pattern, before exploring the one difference her case illuminates.

As with all the interns, Cindy used Shannon's script and then later, more independently, followed Shannon's instructional patterns. Shannon's regular instructional strategies emphasized the acquiring of important vocabulary through a variety of means. First, Shannon had daily "bell work" in which students completed a review worksheet for the first ten minutes of class. These worksheets typically involved students matching definitions and terms, but also included labeling of diagrams and charts with key words. Second, Shannon extensively used PowerPoint slides to give notes which students were

expected to copy into their notebooks. The slides were always animated with music or movie clips that might relate to the content, but also related to Shannon's outside interests. For example, during a lesson on the circulatory system, she included a video that showed a hockey player's injury and the resultant blood spurting. Students were horrified by it and loved it. In Shannon's words "I try to have a lot of variety, keep things interesting. Try to connect kids to the world around them."

Cindy during her scripting stage used Shannon's bell work and PowerPoint presentations, as is. However, during her first guided lead teaching period in which she created her own PowerPoint slides, she realized that she felt more comfortable using slides that she had put together: "I feel like they are my own, not that I'm trying to work with someone else's stuff. I just know it better." However, to my point, Cindy's venturing out on her own simply meant using different PowerPoint slides modeled after Shannon's, including an attention to being visually appealing and stimulating. While Shannon tended to emphasize adding music and video, Cindy aimed for slides that were aesthetically pleasing—attractive backgrounds and fonts, interesting pictures, and the like. Cindy also continued to use the same sorts of review sheets as bell work. Cindy received consistently good reviews around instruction from Shannon, though Hee-Sun did push Cindy to include more inquiry activities. Cindy made attempts to do so and had Hee-Sun attend class several times late in the year to observe her trying it, but it was not a regular part of her or Shannon's instruction. At the end of the year, Cindy emphasized as part of good teaching "keeping things interesting, not letting class become boring" and the bringing in of "real-life examples so that students find biology to be as interesting as I do." In many ways, her beliefs about instruction paralleled Shannon's.

What makes Cindy's case different from the other reproducers is that from almost the beginning, Cindy did not follow Shannon's relational patterns. Cindy came into the internship year with a particular view of how she wanted her classroom:

> I would love to have definitely a relaxed classroom. Not a stressful environment . . . I think kids need to feel accepted. High school is definitely a time where they want to fit in. They want to dress like everybody else and there's all the drama and the gossip and everything. I would like a relaxed classroom which I think is really hard to do, but hopefully, leave your business at the door. We're here to do science. Something that's fun. Where learning's not stressful because they have enough stress in their lives with their schedules, sports, and clubs, classes and homework.

There is nothing about this idea of Cindy's that seems particularly well-developed or concrete. Even when I pushed her on it, she did not include strategies she might use—rather, it was more a feeling or atmosphere she wanted to create. This was not the atmosphere of Shannon's classroom. While Shannon liked to be silly and have fun, she expected students to toe the line, follow the routines and procedures she established, and could be quite tough on students when they did not. When students were working, she would move throughout the room and point students back to work when their attention drifted. During her PowerPoint lectures, she expected students to remain quiet, especially when she was talking and would raise her voice at students if they did not do so: "Jimmy, I asked you to stop talking." She was not a tyrant; rather, she was direct, firm, authoritative, and, on occasion, sarcastic and cutting.

But Cindy's perception was different. She saw the value in much of what Shannon did: "She stays on them and makes them work hard. She means well and she wants them to learn and they do." But Cindy found Shannon "a little bit mean," "harsh," "too sarcastic" and thought that for the students who did not like that style "they were not comfortable in her class at all. Maybe some students are comfortable, but there is a group

of them who are definitely not." Cindy may have even identified with those students.

Though I did not observe it, I overheard on multiple occasions Cindy tell a story about Shannon "snatching" an overhead marker form her hands in front of the class—a situation that clearly bothered her deeply. In an interview, she described it this way:

> It was tough because we ended up being so different in our teaching styles. They always say "don't be like your mentor, you have to find your own style." And I, unfortunately found mine very quickly, and it was not hers. I think it was really tough the first week when I was at the front of the room teaching and this is my first week and I'm already so nervous, and she comes in front and grabs the pen out of my hand, and then starts writing and takes over the whole class. And from that point on I was like "oh my gosh," and I don't think a lot of times she even knew that she was being VERY harsh but the way she would say things sometimes, I would just be shocked. (Jeff: To you or to the kids?) Both. Both.

As a result of, or at least following, that event, Cindy did not follow Shannon's script or patterns in her relationship with students.

Instead, Cindy quite faithfully adhered to her initial vision of creating a comfortable classroom where all students felt accepted no matter what. This was a source of tension throughout the year between Shannon and Cindy, because it meant that behaviors that would never have been permitted with Shannon teaching were allowed with Cindy. On occasion, Shannon would be in the room and unable to resist jumping in to correct behavior, which only led to a reinforcement of Cindy's assessment of Shannon's harshness. Eventually, Shannon tried to find other things to do while Cindy taught. Students flocked to Cindy's room at lunchtime and between classes, officially to get help but unofficially because it became a very loose and fun social hangout. This was a source of pride for Cindy and a source of discomfort with Shannon who felt like the time at lunch could have been used for planning or simply getting a break from students. Cindy admitted that she had not "yet figured out how to use my relationships with kids to

my advantage," but there was no doubt that they felt comfortable in her presence. By the end of the year, Cindy viewed relationship with students as her primary strength as a teacher and a point she would emphasize from day one in her own classroom,

It is hard to know how to attribute Cindy's break from her mentor. Instructionally, she was a "reproduction" of Shannon both in practice and beliefs about instruction, but in the relational components she certainly does not fit. Perhaps the pivotal "pen snatching" event proved enough to change the course of the internship in that regard or perhaps there were other factors at play. I keep her in this category, however, because despite this variation, she stands in sharp contrast to the "strugglers" I describe next.

As I wrap up the description of the group of reproducers, I wish to foreshadow several key characteristics of this group that will become important to my larger argument. First, despite the fact that everyone involved viewed these four cases as successful internships, this is not a story about interns being successful because they converge around a particular practice or conception of good teaching. For example, an important, if not central, component to science education reform has been an emphasis on inquiry (NRC, 1996, 2000). Kimberly, Tammy, Heather, and Cindy all attended the same teacher education program in which inquiry played a prominent part. But the degree to which they ever used it in their internship or integrated inquiry into their vision of good teaching depended entirely on their mentors' use and perspective on it. Vince used inquiry frequently as part of group work and case studies; Tammy used and valued it in the same ways. Ken used "guided inquiry" (though it was not a particular emphasis in his class), but it did not look like Vince's instantiation of it. Instead, guided inquiry amounted primarily to worksheets that emphasized students' interpreting and analyzing

data or models before being told the "right answer." Heather used these frequently and became adept at creating her own. Bonnie was skeptical of inquiry, believing it to be unrealistic. In her interview, Kimberly cited just one instance of trying to "use inquiry" and that only in response to a TE assignment. A similar case could be built for any number of aspects of the TE program. These interns were "successful" because they managed to master their mentors' practice. Second, this mastering of practice was accompanied by a shift in the beliefs of the interns toward the practice they had mastered. Following Korthagen's (2004) levels of change model (See Figure 1.3), I conceive of this as being an example of the development of behaviors and competencies (in this case, from mimicking and following the patterns of their mentors' practice) influencing changes at a level more toward the core of the teacher (their beliefs). These findings suggest that engaging in a practice that emphasizes problem solving or establishing routines and procedures or case studies or explicitly addressing objectives, leads, for the reproducers, to the development of competencies around those practices and eventually a corresponding change in their beliefs.

The Strugglers

The trajectory for the second group begins like the reproducers, but due to an inability to master their mentors' practice, ends quite differently. I'll begin this section by considering the case of Holly, continue by summarizing the pattern found in strugglers, and then more briefly discuss Chad's case of struggling.

Holly and Michael. Michael, Holly's mentor, had one distinct instructional pattern I observed when teaching physics, Holly's major and the course she taught with him. Michael emphasized solving problems. (He taught biology using a different instructional

pattern, but Holly was not always present during that instruction and did not teach biology.) A common lesson structure for Michael would entail 1) an opening question in which students solved a problem like one they had encountered the previous class period (e.g., calculating the acceleration of a block on an inclined plane given the mass, force, and angle of the plane), 2) a period of teacher-led recitation in which Michael would solve the opening problem with student input, 3) an introduction of a new kind of problem to solve including some teacher-worked examples, and 4) a significant amount of time for students to work the new kind of problem as Michael (and Holly) helped students individually. In many ways, when Michael taught this way, it reflected a substantially common-place approach (Wilson, Taylor, Kowalski & Carlson, in press) to teaching physics or mathematics, in that a substantial amount of time relied on teacher-centered problem solving and students solving paper-and-pencil problems from textbooks or worksheets. While the example above was more mathematical, Michael often used more conceptual problems like those emphasized in Hewitt's (2009) *Conceptual Physics*, a book he had used for many years including the newest version that he was piloting for the school. The more conceptual problems might require connecting graphs (for example, a speed and time graph) to a description of an object's motion. In either case, Michael described his teaching as emphasizing the "conceptual" because "there is very little memorization;" he provided students with all the formulas they needed and their job was to manipulate and use them.

Michael did include, on occasion, non-traditional, larger-scale engineering projects that students would engage in over a period of a week or longer. I only observed this kind of instruction one time (of the five times I saw him teach), but based on more

circumstantial evidence, it seems that it was an important part of his classroom practice.

Michael was well-connected in the local science community. He worked in the summer at a large, well-funded research lab at State, had connections to the state's Department of Transportation, and was always seeking professional development opportunities that provided materials, curriculum, and support for his classroom. Students built roller coasters (using materials and curriculum provided by an outside agency), worked with tracks provided by the Department of Transportation to investigate kinetics, or built egg-drop devices. Based on my single observation as well as Holly's descriptions, when one of these projects was going on, students would work exclusively on the projects for up to a week, usually in groups, and Michael (and Holly) would help students troubleshoot or maintain the materials. Michael liked these opportunities to engage students in things "that got them working in groups, working on visualizing" the content in ways that other activities could not. I suspect that involvement working with these outside groups was an important part of Michael's professional identity; he often told me about his summer research experience or professional development he was engaging in, posters from these different groups adorned his classroom walls, and he led several extra-curricular groups that provided his students with opportunities to engage in the kinds of opportunities he received from these outside groups.

Relationally, Michael relied heavily on his ability to befriend and connect with students—"build a rapport with students"—to gain their cooperation. Without this rapport, in Michael's view, "students shut down and, as a result, learning stops." Michael's efforts to connect with students personally were evident on a daily basis. He met every student at the door, greeted them warmly, commented on their clothing or hair

or recent sporting event. Michael was active as an extracurricular advisor, and attended the events of his students often, though, due to health and personal issues, it was less often (by his estimate) than it had been in previous years. Students seemed to genuinely like Mr. Delaney; as I walked in the hallway with him, students were always saying hi or giving him a high-five. On two occasions, I witnessed former students of his, now adults, coming back to introduce their new baby or new spouse to him. Michael was slow to correct student behavior or assign consequences. Instead, he would slide up to an off-task student and joke with them or ask them a question about their sport or club or family. Students responded to these overtures in friendly ways and rarely did confrontation occur. It did mean, however, that Michael spent a great deal of his time engaged in this kind of talk and that students often returned to the off-task behavior after he left. Compared to any of the other mentors in the study, Michael's classroom seemed least orderly, though it generally was pleasant especially in regard to Michael's relationships with students. On the occasions, however, where students showed disrespect to Michael or failed to follow a directive Michael would issue, he would quickly remove students from class to the administrator. This was not particularly common, especially in physics (though more common in his biology class), and Michael joked with me that the administrators "knew the student had really acted up" if he sent them to the office. To summarize, Michael's relational strategies were to 1) engage with students warmly and personally as often as he could, 2) get to know students outside of class through extracurricular activities, and 3) quickly remove students from class to the administrator if his friendliness and respect were not returned.

Holly's year, like the other interns, included an early stage of using Michael's script; in her words, she "parroted what he did." However, quite early on, Holly faced great challenges in building relationships with students. By the time of the first interview with Michael (early-October), he expressed concern that while she "was very cordial" with students (following his example), students "did not seem to be taking her very seriously. . . . She has this voice that almost kinds of lulls you . . . We're working on that." Her field instructor at an early meeting (October 1st) raised the issue of non-compliant students with Holly; he told me after we left her room together that he had seen some "pretty chaotic" moments during her class, though he did not want to overreact just yet. By December, it was apparent to everyone that very serious classroom management problems were occurring. I witnessed lessons in Holly's classroom, particularly when Michael was not present, in which chaos reigned to the extent that it was difficult to detect any hint of a lesson trajectory. It would be gratuitous to describe here how bad it was, but often upon leaving her classroom, I worried about Holly's ability to continue teaching—to take the kind of verbal abuse she faced on a daily basis—and questioned my role as a researcher sitting idly in the chair Michael had assigned to me while she struggled mightily. What I wish to highlight, however, is Holly's approach to solving these problems in light of the kinds of assistance she was receiving from Michael, her field instructor, and her TE course work.

Once Holly left the "scripting" stage and continued to struggle, Michael decided to withdraw more from her classroom in an effort to force Holly to be more assertive and to make it easier for students to view her as "the teacher." (At the end of the year, he expressed doubts about this decision—"I don't know, I wanted it to make her more

resilient. Maybe she would have felt less pressure (if he had stayed), but I was hoping she would get more exposure, more connected to the students.") Michael, however, recognized that Holly continued to struggle. At the December conference with her field instructor (Sam), Sam and Michael spent a great deal of time suggesting resources and strategies that Holly might use. Michael made several suggestions 1) read Harry Wong's *First Days of School*, 2) work on establishing some new routines in the classroom that she might feel more comfortable using (rather than continuing to use his), 3) use the school district's software program to increase parent contact, and 4) be quicker to remove students from class and send them to the administrator. He also praised her for her efforts at establishing relationship with students, for attending their sporting and extracurricular events and for getting more comfortable talking with students. Sam had asked her to prepare a "behavior plan" for the meeting, one that had her own classroom expectations, rules and consequences, as well as some new routines. He also imposed a sanction to express how serious he viewed the problem by assigning her a "Pass with Concern" which meant he was officially bringing his concerns to State's teacher education program. It was a tense meeting. Holly was visibly flustered and, at times, defensive, particularly with Sam who kept pushing Holly to admit how bad things were going. Holly in an interview shortly after this meeting said of Sam, "We're on the same page - I don't know if he knows that I know that it's my most important and biggest challenge, because he definitely reiterates it so much it drives me crazy."

In the lessons following this meeting, however, I saw no signs of changes in Holly's classroom practice. If anything, the level of confrontation with students increased. In one particularly difficult moment, Holly asked a student in the front of the

room to stop talking as she was explaining a problem on the board. The student stood up, turned to face the rest of the class, and yelled, "Man, she's on my dick all the time. (turning to Holly) Why you always talking to me? He's talking. She's talking. Why not say something to him? Why not say something to her? Why not say something to him?" After the student sat down, Holly continued her teaching, "So, you are going to have a decrease in potential energy when . . . ." More importantly, I did not see any signs of implementation of the suggestions that had been noted at the conference (with one exception I will discuss shortly). While both Sam and Michael emphasized the need for new routines and procedures, Holly continued to use the same set of procedures (e.g., beginning with an opening question) she had used before, and students continued to ignore them. She did not have any new rules posted or assign any consequences. While a behavior plan had been written at Sam's request, I could not detect any evidence of its enactment. Though I did not witness it, Sam reported to me that he had seen Holly remove several students from class on a day he had come to observe, though he was skeptical that this was more than a show for him. (Sam later talked with one of Holly's students who teased that Holly always acted tough when he showed up.) Recall, however, that sending students to administrators was one of Michael's main strategies (used relatively rarely) for managing his classroom. In addition, Holly seemed to double-down on her efforts to build relationships with students; she complimented students on their clothing or hair frequently as they entered, she tried to incorporate media that she thought students might appreciate, and she attended as many sporting events or school plays as she could. No matter how mean or disrespectful students were to her, she seemed determined to win them over with kindness and interest in their lives.

Instructionally, Holly also continued to follow Michael's pattern of problem-solving. Class always began with a question on the overhead that Holly expected students to solve on their own and that she would then go over. The problems were often conceptual, utilizing drawings or graphs (e.g., Given the drawings of circuits below, describe what will happen if you unscrew lightbulb A). Presumably, her intention was to talk about the problems, or discuss the problems as a class, before introducing a new kind of problem. However, given the serious classroom management problems she faced, it is difficult to talk about the instructional design of lessons. No matter what Holly planned, the class would invariably end with students sitting around playing cards, talking with friends, listening to their iPods, talking on their phones—anything besides the task Holly wished them to do. Students were quick to yell at Holly, to roll their eyes at her, to ignore her request, and Holly apparently had no tools available to her beyond the two that she saw her mentor use: trying to develop relationships with students on a personal level (which she used valiantly) and removing students when that failed (which she used less frequently because, in her words, it "always leads to this big ordeal").

What is clear in the case of Holly is that, unlike the reproducers, she does not acquire a level of expertise in her mentor's practice. Not for a lack of effort, to be sure; as Michael says in his end of year interview when I asked him about Holly's relationships with students:

> "She tried to do it (develop relationships with students), but in her own way. For instance, in the morning, I always say hi to every single student. She got to see that and she did that. She would say hi, but what happened in a way, there is an element of doing it for the sake of doing it and doing it for the sake of sincerity, really getting to know them. . . . And I didn't see that level in her . . . I think she tried to do it, but maybe she didn't understand why to do it. Maybe I was not explicit with her on why it is helpful, I don't know."

One can see in this passage from Michael a bit of confusion. Holly tried to do what he did, she tried to talk to every student who came in just as he did, but it just did not seem to work. He attributes it first to a lack of sincerity and then to a lack of understanding. Even in the last two weeks of the internship, Michael reported that she just did not seem to make a connection with students. Holly volunteered to stay with her focus class through the end of school even though the university's semester had ended, a step far beyond any of the interns in the study. Michael appreciated the gesture as a sign of Holly's commitment, but reported that when the students in that class found out, they expressed concern. "I just think students feel a little bit anxious with all that goes on when she is here."

For the reproducers, their increased expertise comes with a change in their vision of good teaching to match their mentors'. With Holly, on the other hand, we see a different kind of change to her vision. Prior to the year, she identified as important to good science teaching the use of demonstrations to peak students' interest, along with an ability to connect real-world science with students in the classroom. By the end of the internship, she talked about the need to create inquiry-based assignments in order to give students experiences in class that they could draw on for discussion. Most striking about these lists is that I never observed her try any demonstrations (though she talked on several occasions about one that Michael did in the first week of school) and I have only one documented case in which she tried to bring students' experiences into a discussion (an opening question about common uses of the word "force" that was designed in response to a TE course assignment.) Nor did she or Michael regularly, if ever, use any form of inquiry to teach, though this became her new vision of good teaching. Very late

in the year (March 23), in response to a TE course assignment in which she was required to design an "inquiry" sequence of lessons, I was struck by how little she seemed to understand about inquiry or designing lessons that used it. She was teaching a unit on the characteristic of light and proposed to me beginning the "inquiry" unit by having students read the first few sections of the textbook on the electromagnetic spectrum, "just to give them some background knowledge." She proposed that the "question" for the inquiry might be something about whether solar energy is a viable source of energy to replace fossil fuels. Leaving my researcher role, I asked her about whether she might find some light phenomena to anchor the lessons (e.g. examples of reflection or refraction), might have some activities where students collect and work with data, and I proposed some possible questions that might be more connected to the content. I do not intend to belittle her here; preservice teachers' often have incomplete or naïve views of what "inquiry" might look like in classrooms (Windschitl, 2004), and the term itself is often contested ground (e.g., Johnston, 2008; Settlage, 2007). In that regard, Holly is quite, unfortunately perhaps, normal. However, the striking thing is that when she envisions good science teaching it centers on a concept for which she has little knowledge or sense about how it might be enacted. Unlike the reproducers for whom their vision is considerably more concrete (after all, they "saw" their vision enacted in their mentors' practice for a year), Holly still holds vague notions for what she might do similar to what I saw in all interns, including Holly, at the beginning of the year. For Holly and the other struggler, a year-long internship did little to firm up their visions.

We see an even better example of this when we look at Holly's shifts in beliefs around classroom management. In her first interview, Holly discussed her recollection of

good teachers—teachers she wished to emulate—and what she hoped she would be like. A common theme throughout was her emphasis on "high expectations," "having structure for students so that they always knew what they should be doing," "making sure that students are held to high standards—that they know they will be held accountable." She described a spectrum between teachers characterized by "rigidity and responsibility and accountability" on one end and those that are "more compassionate toward the students and listen to their explanations and allow late papers, for example." At the time of the first interview just as her internship was beginning, Holly wanted to be "more to the accountability side." Her internship year was one in which she struggled mightily with classroom management and was rarely able to create any system of accountability or responsibility in her classroom. Her mentor and field instructor throughout the year encouraged her to set up systems of procedures, rules, and consequences that might work for her, but she never did, at least not to their satisfaction or to the degree that her classrooms reflected any structure. Clearly, these initial beliefs were not aligned with those Michael promoted or modeled that emphasized rapport-building above all along with the removal of students from the classroom when that failed. In her final interview after the internship had ended, she talked extensively about her struggles with classroom management; she recognized it as a problem, one that she knew had been a year-long struggle. Knowing she was seeking employment in large urban districts (similar to Quincy), I asked her what her plan might be:

> I want to establish a method of having a black book of good behavior and bad behavior, recording those things down. If I collect a lot of things that are either good or bad, phone calls can be made home. . . . And establishing rapport with students, being more about pulling everyone together, rather than saying this is this and this is that. Setting a different kind of tone. As soon as they realize that I

> am on their side and want them to do well, I think discipline will be more personal and effective as opposed to just being the authority figure.

One wonders where the "black book" idea emerged from. It has a very police-like tone that stands in sharp contrast with a classroom that "pulls everyone together, rather than saying this is this and this is that." Without reading too much into a single word, her use of the word "think" in the final sentence, suggests that her ideas about discipline still have a tentative nature to them.

Finally, it would be difficult to argue that Holly's internship progressed as anyone had hoped. While Holly remained optimistic about her future as an urban school teacher, she acknowledged how difficult the year had been, that there were many times "where I just lost control, both of the students and myself." She continued to say that the internship was worthwhile, because she had "learned a lot about the things I shouldn't do, the things that didn't work well for me." No one can deny the importance of learning from mistakes, but Holly did not, as the reproducers did, consistently engage in a practice that she viewed as working well. Her mentor and field instructor were much less optimistic. As an evaluative conference in December, Michael told Holly that if she was planning on trying to teach in a place like Chicago, "they are going to eat you alive. I'm not saying that to be mean." When I asked after the year had ended how he felt about making that comment, he said:

> It's one of those scenarios where I made that comment out of concern. . . .Look, you will get hurt—either physically, emotionally, mentally or whatever. And so, when I say 'you are going to get eaten alive in Chicago,' I know that from this smaller town setting, if she can't handle it, to ramp it up two or three degrees, I just think that it will be a much bigger task. Maybe it is not as bad as I think. . . .I tried to give her some survival mechanisms to make sure she isn't completely unaware.

Sam was equally uncomfortable with how the year had gone. He struggled with where to place responsibility for the problems that occurred. He questioned "whether she really got the support she needed to be successful, in terms of her mentor" who, in Sam's view, was not as involved in the classroom as other mentors. He felt that early on, Michael should have "been more assertive" with Holly and said:

> 'These are the beginning of the year procedures I use and the routines I use' and then work with Holly to establish them, maybe adapt them to cater to her style, but that never happened until the year was already well on its way. Then second semester, she revealed that she didn't have any classroom rules for her students but at that point it was so out of hand.

Of course, Sam's diagnosis assumed that Michael had not done this sort of work; in fact, Michael did pass on his practice (establish rapport, attend afterschool events, remove students who don't respond respectfully). It was not, however, the kind of practice Sam had in mind nor did Holly use it effectively. Sam also worried that Holly seemed "oblivious to some of the problems going on around her" and "didn't seem to have much understanding of what the program coursework encourages, things like the learning cycles, inquiry, lesson planning, big ideas, things like that." Finally, he felt that the TE program had let her down, or had at least failed in its certification duties. "It's hard to see her go and get her credential knowing she never fulfilled her obligations or met the program standards. I have some real concerns. I have some real concerns for her."

Chad and Frank. Chad, another struggler, followed a similar path as Holly, though the contexts in which they worked and their mentors were quite different. Just as Holly did, when Chad attempted to implement on his own the patterns he had observed and mimicked in his mentor, he failed to master the practice. As a result, he floundered, was unable to acquire an alternative practice, left the internship without a clear vision for

the kind of teacher he wished to be, and his internship was deemed to have been relatively unsuccessful.

Frank, Chad's mentor, emphasized solving problems in his instruction. A normal day for Frank included going over homework problems assigned the night before (with him working some examples), showing students how to complete a new kind of problem or task, some kind of activity (often involving students' coming to the board) in which students practiced problems in a structured way, concluding with time for students to work on the homework in groups with his help as needed. Relationally, Frank depended on his energy, enthusiasm, and charisma to win students over and minimize classroom management problems or distractions. Frank talked loudly and animatedly, used a host of creative voices, peppered his talks with jokes (often corny), and in Chad's words "just generally overpowered students" with his charm. As a result, students cooperated with Frank, liked him a great deal, and he was known across the school for being a challenging, but well-loved teacher. On the rare occasions when students did not meet his behavioral expectations (I saw this only once), Frank did not hesitate to yell—and yelling was a bit scary, as he got red in the face and very loud. When I saw this happen, students were silent for minutes afterwards. In Frank's words, "I will scream and rant and rave and everybody will shudder . . . but if it happens, it will only happen once, and then when I look up, (imitating students' voices) I'm ready Mr. Dack, I'm ready." Frank did not have firmly established classroom routines, he did not spend time talking about or reinforcing rules, and he did not have consequences for behavior. Students did what they were asked because they loved (and maybe feared) him.

Chad, like all the other interns, followed Frank's script; as I described before, he would scribble madly while Frank taught during the first month or two. And like the other interns, Chad, once scripting was not an option, attempted to follow Frank's patterns and implement Frank's emphases. Instructionally, Chad's classes were structured as Frank's. On a normal day, Chad would take role, work some of the homework problems, introduce a new kind of problem to solve, and try to structure students' practice of those new problems. In Frank's view, the internship should be an "opportunity for interns to try things out, find their own style." When asked about his style of working with interns two weeks into Chad's internship, Frank said:

> I really encourage Chad to create whatever he can. I haven't held back anything, I have given him all my work sheets, everything on CD. I said you can use whatever you want, however you want. But, at some point, you want to create something that you take pride in. He said, "yeah." So he's getting close, he hasn't created anything that I consider his own yet but he is getting close.

But at the end of the year, Frank felt disappointed that had never really happened; in his view, Chad had never created anything new "that he could be proud of" or developed lessons that did not, to Frank, seem a lot like what Frank was already doing.

Relationally, Chad faced many of the same challenges as Holly, though never reaching the level of chaos I witnessed in Holly's classroom. Chad identified classroom management as his greatest struggle throughout the year, and his field instructor worried about student motivation and engagement, as well as how seriously students took Chad. Frank reported that a number of Chad's students would complain to him about Chad—that they could not learn from him—and he suspected that in many ways "they were laughing at him behind his back." Attempting to re-enact Frank's energy and enthusiasm—to emulate Frank's charisma—was a challenge Chad recognized very early

in the year. In a support meeting with his field instructor and five other interns at the end of September, he described Frank to the group as an Energizer Bunny, "hyper-energetic and hard to emulate." He told the group "I spent the beginning of the year trying to copy his style, but it's a disaster because I can't do it" given his natural tendency toward introversion. But Chad did not decide, as a result, to pursue developing his own style. In his January interview, he talked about this struggle:

> I need to get out of my shell a little bit more and show a little bit more enthusiasm. But at the same time, I'm not Frank. I'm just not a high energy, goofy guy as he is. . . . But there are things I can emulate and try to do a little bit more. He utilizes his voice. I read about it in a book on motivation, and I was reading it because it shows a lot of what he does. It talks about using your voice, projecting different styles of inflection, changing it to make it more interesting for the student. It's like acting more or less. Frank has basically mastered that, so in a lot of ways, I want to look at that.

One can see here that, despite his early perception that he could never be Frank, Chad continued to pursue ways of becoming more like him, of trying to develop a style like Frank's. He continued, "I think it's not just an issue of becoming like him, it's seeing what he does and seeing how I can make that happen."

What else might Chad have done? His field instructor discussed with him at every conference I documented the need to "establish a classroom community of learners" based on mutual respect, not based on the teacher's charisma, and they discussed strategies he might use to begin that process. Alternatively, in one of his teacher education classes, *Teaching with Love & Logic* (Fay & Funk, 1995) was emphasized as a classroom management approach. Chad was intrigued by *Love & Logic* (as it was commonly referred to), committed at his end-of-fall-semester conference to read and implement the approach, but I saw little evidence of its influence in the class. Frank reported his recollection of Chad's first attempt at its use:

Frank: And I think the first time he tried Love & Logic, he came here (and said) "I'm trying Love & Logic today." I said '"did it work?" He said "kind of." I said, "well, okay you have to stick by your guns because if you don't follow through . . ." But when something didn't work he just would give up, he would – the comment would be "I don't know." I said "no, you do know, you do know, come on. How are you going to handle this, what can you do to handle the situation?" (Imitating Chad) "I don't know." That was disheartening to me.

Jeff: Did you see him try Love & Logic after that first try?

Frank: I don't think so, no.

While Love and Logic passed away quickly, Chad's attempts to enact Frank's emphases persisted throughout the year, despite the fact that he thought it would never work. Late into his lead teaching, he taught a lesson on oxidation-reduction reactions in which he persistently tried to joke with students; they took every joke as an opportunity to take the class off topic and he would spend minutes getting their attention back. At the conference with his field instructor, she expressed doubt whether students were respecting him or his learning. He agreed, but when asked whether he had a strategy for combating it, he replied, "No, I don't. The class beats me down pretty good and I get discouraged . . . Frank has established this joking environment that he can finagle well. It works for him."

The disconnect we see in Holly between her initial beliefs, her practice, and her ending beliefs is present with Chad as well. Before the year began, Chad talked about the importance of getting students "to learn and be motivated in their own unique way and to be able to effectively balance being the teacher in the front of the room but also being the individual teacher for each student." Motivating students meant "connecting with students and their lives;" this included finding ways to bring "real science" into the classroom, an emphasis that came from his summer internship with a chemical company. He also believed teachers need to be sensitive to "social justice issues . . . racism, sexism, and the various ways bigotry can manifest in the classroom." Frank's emphases of

problem solving and presence were not on his radar. During the year, however, Chad enacted problem-solving and struggled all year to develop his classroom presence. While Chad did show a sensitive spot for students on the margins (a point both Frank and his field instructor noted in the interviews), Chad developed a reputation among the interns as being quick to complain about his students, to assign them the blame for his struggles; he admitted being "embarrassed" by this in a conference because it conflicted with his principles.

At the end of the year, Chad's vision of good teaching had changed but it looked neither like his initial beliefs nor his mentor's (and his) practice. In the interview, he sounded more certain than Holly did, more confident and more coherent in his ideas about what he thought he should do. However, like Holly, he described a hypothetical practice, one that he "wishes" or "hopes" to be able to try rather than one based on either witnessing it or engaging in it. For example, Chad at the end of the year emphasized the development of a "community of learners" in which students are not "content to just sit there and not understand, but know that they can get help from me or their classmates." When I asked him what I would observe if I came into a classroom where that was happening, he said:

> I think in some ways, what I'd like to do is create pockets of students where they work together in groups where you have some sort of question at the beginning of the hour that they work together on, or work in labs together so that you can hopefully establish something where they're working and improving. Because often times when you just throw someone in a group, it's going to be a different one each day and that's not going to be that effective because that's not how groups work. Also when you are helping a student try to include the rest of the people in the assistance, because I noticed that sometimes if you're working with one kid, the other kids are just staring at you so try to include them and get them into get them in the conversation. . . .It should be expected that I'm willing to help them, but I guess friendliness, sitting with them and when you're helping them you could seem more cooperative and not be condescending about it.

When I asked him if he had been able to accomplish this kind of teaching, he said, "No, I think this is more aspirational, noticing the things that I wasn't doing and how it really needs to be different. Maybe I was starting to do these things, I don't know."

Finally, as with Holly, the internship was not viewed as successful by those involved. His field instructor felt that "it was a challenging year for Chad" and "challenging for (her) particularly because (she) just didn't see much progress." Her very last observation of the year in April was one in which "it was so chaotic and out of control and he would try to say something firm, but kids were just joking and disregarding what he said and arguing with him." In addition to classroom management, she did not "think that his ideas about science teaching had progressed very far." Particularly frustrating to her was that, due to Randolph High's trimester schedule, Chad was able to teach the same content three different times, and he made very few changes each time. Instead, he stuck with the more traditional (in her view) style of Frank. She worried (much as Sam had about Holly) that Chad "didn't get enough support" from Frank, but this was based not on her observations of Frank's support, but on her perception that Chad was not progressing. Frank also worried that Chad had not made much progress. Frank recognized that Chad had a very different personality and reported telling Chad often that he needed to develop his own style, his own way of doing things, and his own activities. But he rarely saw that "kind of initiative. Maybe it's a work ethic thing. Maybe it's just his personality. He had some personal things going on this year, too. I don't know." While Frank liked Chad a great deal and talked about him affectionately, the year had clearly not gone how Frank had hoped. Chad also admitted

that it had been a tough year, though when we talked in May two weeks after the internship had ended, he was beginning to get reenergized about teaching:

> There was a period midway through the lead teach in March where I was looking at lab jobs just because I was getting really frustrated and not really sure if I could even do it. But I think now that I am done with it all, I am really looking forward to teaching again and I am starting to get plans about things that I can teach and strategies I can use to improve myself and get better. So now that I am looking for a job, I am reenergized. But there was a period that I was having serious doubts.

Like Holly, and in contrast to the reproducers, taking on more responsibility in the classroom from Chad's mentor led not to greater skill, but deeper frustration and concern. Chad failed to master his mentor's practice, never formulated or attempted an alternative practice based on suggestions from his mentor, field instructor, or TE courses, and left the internship with a fuzzy vision of what he thought good teaching might be.

Conclusion

In summary, the strugglers began the internship attempting to follow the script of their mentors, just as the reproducers did. However, when following the script was no longer possible and the strugglers tried to implement the instructional and relational patterns of their mentors, they never saw the steady progress that reproducers did. Instead, students failed to respond to them and they received feedback that suggested they look to develop some new strategies that might work better for them. Rather than taking that feedback and making changes, they redoubled their efforts to be like their mentor; Holly said hello to every student who entered, went to many games and plays and concerts, and threw out more and more students while Chad read books on motivation and acting to increase his presence while sticking with a joking banter that never worked for him. Perhaps most surprising is the doggedness with which the strugglers clung to their mentor's practice despite the poor results and the alternatives they might have tried.

Neither mentor expected the strugglers to copy them—in fact, both made moves later in the year to try to give the interns more independence in the hope that they might stake their own claim. Interns were not without alternatives to try. Both came into the internship with their own vision of teaching that differed in significant ways from their mentor; they might have worked on implementing that vision. Both were getting feedback from their field instructor and mentor about strategies they could try, books they might read, or plans they might create; they might have chosen one or two of those and pursued it. Both were in TE courses that proposed a reform-oriented perspective on science teaching and alternatives to their mentor's classroom management plans; they might have tried to put those ideas into practice. Instead, they stuck with what they saw, continued with what they had started; in this regard, they were just like the reproducers, though the outcome was less optimal from everyone's perspective.

What bears some further investigation is this dilemma. One might expect that a field placement in which a mentor's practice works for an intern would have a momentum that might prevent any outside ideas from gaining a foothold. It could be argued that a "successful" internship (one in which reproduction happens) might not produce a level of pedagogical discontentment (Sowell, Southerland, & Granger, 2006) or dissatisfaction with their teaching sufficient to motivate the intern to look to TE or other sources for a different kind of practice no matter whether it matched their own vision or the vision supported by TE. But this cannot explain the strugglers who were discontent, saw discontentment all around them, and still failed to take up a practice other than their mentors'. To explore this further, the next two chapters will examine the world of the interns in greater detail, to try to describe their lived experience in both their school

placement and in teacher education. What is it about the experience in schools and TE courses that produces such an apparent enduring and negligible, respectively, effect on interns' practices?

Chapter 4:
Learning to Teach in School

Given the influence of interns' experiences in schools on the teaching practices they engage in and, for some, their beliefs about good teaching, I continue this analysis by shifting my attention to the school components of the interns' ecologies. The trapezoid in Figure 4.1 (below) indicates the interactions that will be the focus in this chapter. My intent in this chapter is to further explore the mechanism for the finding in the literature and this study that the cooperating teacher and school-sites have a powerful—though often not-entirely-welcome (from the TE program perspective)—effect on the student teacher/intern.

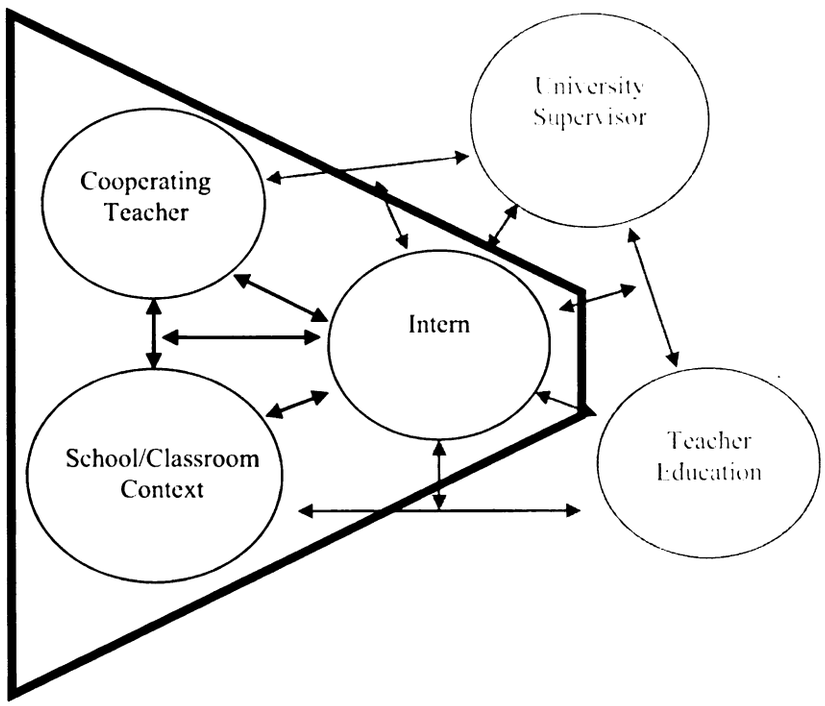

Figure 4.1. Narrowing in on the school side of the interns' ecology

Thus far, it is clear that each intern's experience was distinctive; each had unique personalities and backgrounds, different experiences with mentors of all stripes, and had

internships that I have characterized as being reproductions or struggles. Despite that diversity of experience, the work that interns engaged in at their school sites shared common characteristics and patterns, including: 1) a world surrounded by real-time assistance and feedback; 2) attention to kinesthetic, embodied, and physical aspects of the work of teaching; and 3) a task-orientation that focused on the daily activities of teaching.

Real-time Assistance and Feedback

Lortie (2002) described teacher induction as a process through which new teachers were expected to "sink or swim," left on their own for survival (or not). Unlike the stereotypical student teaching experience in which the mentor hands over the keys to the student teacher and disappears to the teachers' lounge, State's program structure worked against that idea as interns gradually took more responsibility from their cooperating teacher over the course of the year. As a result, interns and cooperating teachers spent a great deal of time in the classroom together, either while the mentor taught or while the intern taught, and for most interns, this opened up an avenue for receiving real-time feedback and assistance from their mentors.

Real-time assistance and feedback took three distinct forms. First, while interns taught, cooperating teachers publicly stepped in and assisted, thus temporarily reasserting their teacher role. Second, rather than assisting interns directly, cooperating teachers would, usually privately, direct interns' attention to something occurring in the classroom without actually intervening. Finally, cooperating teachers worked behind-the-scenes to make interns' classes for run more smoothly, often without the interns' knowledge.

Stepping In

While the program's expectation was that mentors and interns would collaborate, a strict distinction in roles was maintained by the program and by most intern-mentor pairs as to who was "teaching" at any given time. Most interns referred to their focus class as "my class" and the others as their "mentor's class"; they might tell each other that "I'm picking up my mentor's human biology class for my lead teaching," meaning that for the lead teaching period, that intern would act as the teacher (and consequently the mentor would not) for several weeks. At any given moment, both the interns and cooperating teachers knew who the "teacher" was and who was observing or assisting. Despite that clear distinction, there were moments when mentors blurred those lines to provide interns with real-time support or assistance.

Sometimes they did so because an intern asked for help. These explicit requests usually centered on technical or mechanical problems an intern could not solve and occurred only in the first month or two of school. For example, during a lab in which Tammy took students outside to collect pond water, each group—one group at a time—was supposed to use an apparatus to collect water from the center of the pond. Tammy set herself up as the one assisting the students with that procedure, while Vince monitored the rest of the students. However, when the first group's test tubes became jammed in the apparatus, Tammy struggled for about 30 seconds before calling over to Vince, "Hey, Mr. M, I can't quite get this." Vince came over, unattached the first group, got the second group set up, and then took over the collection assistance as Tammy moved to Vince's previous position of monitoring the students waiting to collect their water.

Sometimes the assistance was much briefer as when Chad, on the first day of school, could not get the LCD projector to focus and asked for Frank's help. Once Frank had things focused, he turned it back over to Chad. In a similar way, when one of Heather's weblinks to a video appeared to be broken, she stepped aside and allowed Ken to take over the computer to find an alternative video. Once Ken found one he liked, he returned to the back of the classroom, and Heather used this new video in her lesson.

Cases in which interns asked for their mentors' intervention were relatively rare, and like the examples above, almost always involved equipment or technological problems. The single exception to this involved a situation early in the year in which two horse-playing boys tackled one another and wrestled on the floor. Tammy ran across the hall to the teachers' lounge where Vince was working because "it was during my first lead teach, and I had no idea what to do." Vince came across the hall, and assertively directed the boys to sit with him in the lounge for the rest of the class period. Once the boys were gone and with Vince, Tammy began teaching again. The boys both sheepishly apologized to Tammy after class.

Interns did not ask mentors to help them explain something they did not understand or (with the exception of Tammy above) request assistance in real-time for management concerns or disruptive students. Despite not having been asked, mentors did often "step-in." The two most common reasons were to clarify or expand upon directions that interns had given students or to correct or expound upon interns' content explanations. Shortly after interns would give students directions for a procedure or activity, mentors would interject, direct attention to themselves, and then add additional steps or expand upon something the intern had said. For example, Kimberly, with about a

minute remaining in class, told students "OK, this is your official pack-up notice." As students scrambled to get their books and folders together, some took the additional step of lining up at the door to wait for the dismissal bell. When Bonnie saw this, she raised her voice slightly and began to move to the front of the room: "Ladies and gentlemen, we are not cows. We do not herd to the door. We are civilized human beings." The students (and Kimberly) laughed and began to move back to their seats. Similarly, near the end of a lab taught by Tammy, she asked students to return from the lab benches at the back of the room to their desks in the front, reminded them about the homework that they had due for tomorrow, and then said, "OK, every group needs to label their test tubes, put the tubes in the rack at the back, and then clean up your work stations." As students started to get out of their seats and return to the lab stations, Vince stepped in to include additional directions:

> Hold on. Hold on. First, the way we are going to label the test tubes is to get a small piece of the masking tape in the back and then put your bell number and your group members' names on that tape. That way we don't get tubes mixed up. You'll find the markers to do that over there in the supply drawer.

He followed up with some directions for storing the tubes, cleaning up their lab stations, and checking their stations to know they were finished. Then, he dismissed students to work. Some interventions were less dramatic, involving mentors simply adding a supporting detail to interns' instructions. Cindy told students that, during their classmates' presentations on stem cells, they "might want to write down the things the presenters say" and Shannon added, "Especially if you don't know the material!"

This kind of clarification also occurred around interns' content explanations and, likewise, could be small and short interjections or more extensive. Heather taught a lesson on activation energy of chemical reactions that involved students following an

online simulation as they completed a worksheet she had designed. The simulation appeared to engage students, particularly because it allowed them to change variables (like temperature, activation energy, and enthalpy), and then see how the reaction proceeded. Simulated particles would bounce over a wall, faster or slower depending on what students inputted, and students enjoyed trying to make the reactions behave in various ways. However, few groups paid much attention to the worksheet nor were they systematically changing the variables one at a time to gauge a variable's impact. Sensing this, Heather spent the last 20 minutes of class working with groups one at a time and talking them through the worksheet's questions, following a similar line of questioning with each group (e.g., "So have you figured out how to get yourself more products? What does adding heat more do? What does lowering the bar do? Wait, wait, not so fast. Let's go back to the worksheet, what steps are you supposed to follow?"). As class time ran out, Heather made an announcement: "Okay, we can put these worksheets away and log out of the computer. It's time to go." Ken stepped in:

> I would definitely read the worksheet pretty carefully, okay. Because this can get pretty overwhelming without it. . . .Did you notice the ways that you could actually get all the reactants to products? Most of the reactions that we do aren't actually going to go to completion like this, but we will pretend that they do, because it is easier to think of them that way. And a lot of the ones we do might go 99.9% of the way so it is ok to think of them that way. But I wanted you to see this simulation.

Although Heather had been the "teacher" for the entire class period, Ken wanted to make sure that students had some ideas about the limitations of the simulation. While Ken's intervention involved the whole class, some interventions occurred when the mentor stepped into an interaction between an intern and student. For example, Tammy was reviewing the endocrine system with the whole class and asked: "You guys

mentioned hormones. Do you know what a hormone is?" Jake answered, "Well, for males it is testosterone and for females it is estrogen." This appeared not to be what Tammy was looking for and she said "But do you know what they are? They are actually chemical signals." At this point, Vince, sitting at his desk in the front, stepped in, "But Jake is right. Testosterone is saying to the body 'grow hair on your face' to the boys and for the girls, estrogen is saying different things." Jake looked a bit relieved, and Tammy said to him "Good job," before moving on with the review. These sorts of interventions (both for directions and content) occurred frequently; across all interns, a little more than once a day, with more frequency during the first semester of the year than during the second.

Another frequent occasion for "stepping in" involved interns overestimating the time needed for a lesson. In some cases, the intern made clear that she had run out of things to do, as when Tammy ended a lesson in September with a public declaration: "I don't have anything else." Vince sitting at his desk, immediately asked the students, "So how would I find something on my microscope? Someone talk me through the process from the very beginning," using the last 10 minutes of class to review microscope procedures. In other cases, it is not clear that the intern recognized the need for help. Holly's lesson left 25 minutes at the end of class for students to work on homework problems. Soon, the class was chaotic and few students seemed to be working. Holly, however, continued to make her way around the class, helping students who would begin working as they saw her approach. After 15 minutes, her mentor stepped in and directed students' attention to him. He held a Slinky, a toy he was planning on using with his physics class next period. "Does anyone know the connection between this Slinky and

our celebration of Women's History Month?" He talked about the Slinky's origin as excess metal from machine shops during World War II and a female inventor's idea to market them as a toy. The content of his comment might be dubious (it doesn't relate to the topic of the lesson and his story seemed apocryphal), but the chaos was reduced, students were quiet and listening, and class ended on an interesting and upbeat note. Whether the intern made clear that she had run out of things to do (as Tammy did) or not, mentors often filled wasted time and maintained their class's momentum.

Directing Interns' Attention

A second way that mentors provided real-time assistance was to *direct interns' attention*, privately or publicly. A less dramatic intervention (that is, mentors do not *do* anything for the intern), it was nonetheless very effective. When mentors directed interns' attention, interns responded immediately.

Sometimes, a mentor conveyed to the intern how he or she thought students were thinking or feeling. Often, mentors would be in the back watching an intern lecture and would say, "Miss Ahrens, can you put that on the overhead so that they can see it better?" or (speaking to students) "Hey, did you guys get that explanation ok?" or "Why don't you tell them where we are headed?" In these cases, Tammy adjusted the overhead to bring it into focus, Heather doubled back to re-explain something, and Chad provided students with an outline for the upcoming unit. One mentor, Bonnie, occasionally role-played a student while Kimberly taught. As Kimberly was solving an equation involving specific heat for students, Bonnie raised her hand, was called on by Kimberly, and asked "How do you know if the 'm' in the formula is for *mass* or for *moles*?" Kimberly answered the question straightforwardly, "Well, you know because your specific heat will be given

either in grams or in moles—whichever one it is, that's what you will use in the formula." She finished with "Good question," at which everyone, including Kimberly, laughed. In examples like these, mentors put themselves in the seats of the students, imagined what they might be thinking or struggling with, and then cued the intern.

A second way that mentors directed interns' attention was by privately prompting them to take action. Often, this involved the mentor moving alongside the intern as he or she taught and making a quiet suggestion about something the mentor had noticed or thought the intern should do. Many times, I missed the content of these suggestions because they were handled privately, but they looked similar even without hearing them. Students would be working in groups, the mentor would come up to the intern, speak in her ear, the intern would lift her eyes and direct them somewhere in the room (usually at a student) as the mentor talked, and then head to that student when the mentor finished talking.

When a group of boys began to roughhouse at a lab table, Vince asked Tammy with a bit of an edge in his voice, "Ahrens, why don't you go back there and yell at them?" Tammy immediately walked toward the boys and —not yelling —said: "Why don't you get back in the groups you are supposed to be in?" Bonnie walked passed Kimberly as they monitored groupwork and asked her, "Where's Jimmy?" Kimberly scanned the room, remembered that she had written him a restroom pass nearly 20 minutes before, said to me, "Uh oh, missing students. That's not good," and called to the main office, letting security know that Jimmy had been gone too long. These promptings from mentors could involve simple non-verbal cues that interns seemed to understand. Bonnie would frequently hold up fingers and Kimberly would announce, "OK, two

minutes left, guys," or Frank might —from behind the students (and out of their sight)— gesture to the lab tables leading Chad to quickly end his lecture or discussion and send students back to the tables to work. A significant number of these more private promptings revolved around the management of materials. For example, Michael would often ask Holly: "How we doing on calculators?" or "Do we have all our books?" near the end of a period to remind Holly to get all the materials back from students. Shannon would point out to Cindy when students were using lab materials inappropriately or when supplies were running low.

When mentors directed interns' attention, they could do so with less risk to the interns' credibility with students, because the "role" of the teacher was not usurped. The interns ran the show—explaining, disciplining, collecting materials, etc.— but on the sidelines, the mentors were cueing interns in, helping them notice things, decide what to do, or change course. While stepping-in puts the intern in the position of observing the mentor complete a task, when the interns' attention is directed, the intern is still left deciding how to implement whatever the mentor has suggested. Tammy checks on the horseplaying boys, but chooses what tone to take. Kimberly gets help in noticing Jimmy's absence, but makes the decision on how to proceed. Mentors convey their appraisal of the minutiae of the work of teaching, seemingly trivial acts, often rooted in someone's intuitive sense of how to read a room or read a kid or anticipate an adolescent mindset. And this is not the stuff of textbooks —nor should it be —but without these hints, these little cues, the interns would run into much bigger problems.

Smoothing Things Out

A third way that mentors assisted interns in real-time has a very different

character from the first two, because interns might not even be aware of the assistance. When mentors "smooth things out" for interns, they attempt to prevent interns from having to face a potential problem or handle too many tasks at once. Examples of smoothing things out include mentors completing everyday tasks for interns, addressing issues of student understanding one-on-one when they perceive students are confused, and, most commonly, attempting to prevent student misbehavior.

Mentors commonly completed everyday, routine tasks for interns as they taught, keeping interns from having to do more things at once, as well as preventing potential problems or confusion. Examples included passing back student work while the intern taught, collecting student work, taking roll, or entering grades. It should be noted that these are the same tasks that interns generally performed early in the year while the mentor was teaching; it may be that mentors were returning the favor or simply keeping busy to avoid boredom. However, other routine tasks completed by the mentor were not the sort interns did. For example, on several occasions, Cindy began teaching her first bell class in the dark or would forget to turn on the lights when transitioning from lecture notes to an activity. Shannon would come into class, notice the lights off, and turn them on. Bonnie regularly updated the daily agenda kept on the board whenever she noticed that Kimberly had forgotten to change the date or homework assignment. Vince would go to the adjoining stockroom to get additional needed materials when supplies were running low. On several occasions, Frank corrected the spelling of a word Chad had written on the board in between classes. These small assists, easily unnoticed by the intern, potentially prevented student confusion or the disruption caused by students who might make a big deal about a teacher's slipup or error.

Two mentors, Bonnie and Vince, also "smoothed out" things for their interns in ways that related to student subject matter understanding. Bonnie did this in two ways. First, she often participated in class as Kimberly taught, much more so than any other mentor in the study. As I described previously, she would occasionally role-play as a student in order to direct Kimberly's attention to something she thought students might be thinking. She did, however, also participate in more subtle ways. For example, Kimberly spent a great deal of time preparing elaborate PowerPoint presentations. Her slides were complex, even busy, with animated mathematical formulas, relevant art, even self-designed cartoon characters (Biff and Olga) who were featured in every story problem. As Kimberly lectured using the slides, Bonnie would sit at the computer and move the mouse so that the arrow would point to the particular aspect of the slide that Kimberly was talking about. In this way, Bonnie would direct students' attention to what she deemed important. At other times, Bonnie moved throughout the room as Kimberly solved example problems or led a discussion. When a student asked Kimberly a question, but seemed dissatisfied or confused with the answer, Bonnie would sidle up next to that student and have a short tutoring session while Kimberly continued.

Vince used a similar technique of targeting students who appeared to be struggling to understand his intern's explanation of content for one-on-one discussions. For example, during a lesson about the translation of DNA, a girl asked Tammy: "Can you explain the difference between translation and transcription again? I don't think I'm getting it." Tammy pulled up the presentation she had used the previous day and quickly (approximately 30 seconds) walked through the key differences between the two. Tammy ended with: "Does that help?" to which the girl replied, "Yes." Tammy dismissed the

students back to the lab tables to work on the new activity for the day. Vince immediately sat down next to the girl and reassured her: "So, it will take some time to get this. That's why we have you practice it, and in time, you will get it. Why don't you use these models to show me what you think the difference is?" He spent the next four minutes helping the girl with her explanation. The other four mentors would circulate and answer student questions when they were present in the room, but not in the same targeted way that Bonnie and Vince did.

The third and most common way that mentors smoothed things out for the interns was by attempting to prevent student behavior problems. The most common technique was simply using their own proximity to curb problems. For example, if a student quietly chatted with a friend while Kimberly was teaching (and Kimberly had not addressed the situation), Bonnie would walk over and stand right next to the talking student, immediately ending the conversation. On occasion, mentors might gently intervene by tapping a student on the shoulder, wake them up, or direct a daydreaming student's attention back to the front of the classroom; in a case like this, the intern might notice the mentor moving about but not see the intervention. Less often, mentors, sensing something going on that might escalate, would step in. For example, during a sheep brain dissection, several of Cindy's students found a stash of blood pressure cuffs left out on a shelf. Before long, they had the cuffs out and on, tightening them on each other's arms, even putting one around a sheep's brain. Cindy was on the other side of the room and did not notice this occurring. Shannon watched the situation from her desk for about 10 seconds, but when she did not see Cindy act, she went to the students, scolded them, and had them clean up and put away the cuffs. While Shannon's (and other instances like it)

intervention is more dramatic here, the rest of the class continued to work and Cindy maintained her role as teacher. After class, Shannon explained what she had seen students doing, but at the time, Cindy did not see (or at least react to) Shannon's intervention. Other examples include mentors heading into the hallway to round up a straggling student or splitting up a group of students more concerned with flirting than with completing a lab.

In real-time, interns must manage students and materials, respond to students' questions, and make changes in instruction among many other tasks. Things happen quickly and the demands on the attention and skills of novices learning a complex task are great. And the risks if they fail, as perceived by interns, are real and important; interns commonly worry about whether their students will learn if they make a mistake or if their students will respect them if they are shown to be weak. By providing the assistance to interns in the moment, mentors are able to mitigate some risk while reducing the complexity interns encounter.

The Physical and Embodied Nature of Learning to Teach in Schools

The interns' experiences in schools had a distinct and important physical and embodied component to it. Rose (1999) described beginning physical therapists in a clinical class as engaging in "kinesthetic-conceptual work" because of the tight connection between their bodies, their patients' bodies, and the principles of physical therapy being promoted by the instructor. Learning, in this setting, included close physical work between the teacher and the new therapist, as the teacher might join hands with the novice in performing a manipulation for the first time. Instructors also used conceptual tools like diagrams, concepts, or rules-of-thumb that connected to the physical

reality that the novice therapists were experiencing. Students would, with instructors' assistance, for example, draw a "movement diagram" that translated the resistance the novice felt in a patient's knee into a representation that could be discussed as a class.

The kinesthetic-conceptual work of learning to teach took several forms in the schools. First, and perhaps obviously, interns in schools looked like teachers, using their mentors and the school culture as a guide to their appearance. Second, interns learned to move like teachers by watching their mentors complete the physical acts of teaching; this included taking on some physical mannerisms of their mentor in their own practice. Third, interns were tasked with managing the physical space of a classroom, including materials and students. Finally, interns received considerable guidance (both in real-time and in planning) from their cooperating teacher on the managing of space, materials, and students' bodies, including more "meta" discussions concerning the use of one's body as a teacher.

Looking like a Teacher

Hee-sun, the field instructor for Tammy, Chad, Heather, and Cindy, held meetings for all her interns hosted either at her house or by one of the interns. These were casual affairs that interns simultaneously appreciated and resented. They valued the chance to come together and talk about their experiences (as well as be pampered by Hee-sun who would bring special foods and drinks), but struggled to give up two hours on an evening when they could have been planning for class, completing TE coursework, or visiting their family and friends who they rarely saw. These meetings were loose and free-flowing. Hee-sun usually brought an agenda, but it was rarely followed. Instead it was mixture of outrageous stories about interns' students and their parents, complaints about

their mentors' idiosyncrasies, heartfelt expressions about their own perceived inadequacies, and opportunities to celebrate small successes. Interns sat on couches with their feet propped up, wore casual clothing, laughed loudly, and cursed frequently. But for the fact that the conversation was about schools, one might not know these young people were teachers.

But when interns were at their school sites, they carried themselves quite differently. Interns, not at all surprisingly, took on the physical stance of their mentor. This point might be obvious, so I do not wish to belabor it, but when interns came into school to work with mentors, a significant part of the task was to look and carry themselves as a professional teacher, including dressing like a teacher and taking an authoritative stance.

When interns were in their school sites, they dressed much like the other teachers in the school. In some cases, interns followed the cues of their mentors in determining what "professional" dress might mean. Tammy, for example, followed Vince's cue in wearing casual work pants (never jeans) and comfortable shirts and shoes. Vince never wore a tie or sportcoat; Tammy never wore more formal dresses or skirts. In the same way, Holly followed Michael's cue of "dressing up." Michael always wore dress pants and a sportcoat and Holly usually wore a skirt with a dress shirt. In cases like these, interns seemed to dress up or down, calibrating their appearance with their mentors'.

Kimberly and Cindy were exceptions, in that they dressed significantly more up than their mentors. Bonnie, Kimberly's mentor, often wore casual pants and shirts with vests; Kimberly looked like she walked out of a fashion magazine. While Bonnie walked around in comfortable gym shoes, Kimberly clopped around noisily in chunky heels.

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Likewise, Shannon coached and was a competitive runner, and so on some days she wore clothes matching those roles; Cindy, on the other hand, never dressed in these more casual clothes. Weber and Mitchell (1995) argue that teachers' clothes are part of the cultural text for teaching reinforced both by the media and by years spent in classrooms watching teachers. *That's Funny, You Don't Look Like A Teacher* (Weber & Mitchell, 1995) captures the essence of what I say: teachers (for good or bad) are expected to look and dress a certain way and in this study all the interns met that expectation. No one seemed to chafe at this expectation or felt stifled under these constraints; I never witnessed a cooperating teacher or teacher educator correct interns over issues of dress, though when preservice teachers were preparing for field placements prior to the internship this did get some attention by teacher education faculty. Only once during the internship did I observe the issue of dress come up; at the first TE course of the year, I overheard Heather telling Cindy about the shopping spree she took with her mother to get the clothes she needed. Interns looked like teachers when in the schools.

Moving like a Teacher

In addition to looking like teachers, interns also used their bodies like teachers to establish their authority. As described previously, interns took on the "teacher" role in different ways throughout the year. Even when they were not the "teacher" and were observing or assisting their mentor, they still positioned themselves like teachers. They roamed around the classroom freely without direction or permission from their cooperating teacher. Interns moved from the front to the back of the classroom to work on a new task, left the room to use the restroom or make copies even if their cooperating teacher was in the middle of talking, or walked through the classroom helping students at

their desks during classroom activities (just like their mentors). Bonnie told a story about an undergraduate observer (pre-internship) from State completing an early field experience in her classroom; this college student sat in a student desk during class and raised his hand to answer Bonnie's questions (intended for her high school students). No such role confusion existed for interns, especially when in the classroom.

When they were teaching, they likewise adopted the physical behavior of the mentors, easily and quickly. At the beginning of the year when they followed their cooperating teachers' scripts (and, later, instructional and relational patterns), they occupied the spaces in the classroom that their mentor had. Interns stood in front of the classroom to make announcements or lecture, walked around the class to help students while the students sat, spoke when they wanted and asked students to raise their hands before speaking, controlled the classroom environment by turning lights on and off or putting some equipment out but not others out for students to use, answered the telephone when it rang in the classroom, and signed students' passes to the restroom or office. When in the teaching role, they performed the physical tasks of teaching with, as I described in the earlier section, occasional real-time help and assistance from their cooperating teacher.

In some cases, the use of the mentor's scripts and patterns also extended to physical aspects of the jobs. Interns did not just say the same things; they also moved and used their voices like their mentors did. For example, I described earlier Tammy's gradual use of Vince's strategy of joining in social conversation before redirecting students to work. This strategy had a physical component to it as well. Vince and Tammy would notice a group of students who seemed to be getting off track. In other classes

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where I observed situations like this, interns or mentors would walk quickly to that area of the room, and students would, if they noticed the teacher—at least temporarily—direct their attention to the approaching teacher. If they failed to notice, the teacher would move into the students' line of sight, often by standing over the shoulder of one group member, and interrupt the off-task conversation.

Vince's technique, and Tammy's in time, was much slower. They would gradually begin to move toward the louder group, perhaps even stop at another table for a brief conversation, and then position themselves just outside the group of students, often several feet away. They would wait for a lull in the conversation or for a moment in which they could interject their own personal story, and only then take a more central position in the circle of students. This moment of interjection might be the first time students in the group even noticed them standing nearby. Tammy and Vince may have benefitted from the fact that students sat high on lab stools around a lab table rather than at student desks, allowing Vince and Tammy to be less obvious as they moved around the classroom. However, the slower speed and roundabout-ness of their approach to the table looked different from any other teaching I observed, as was the way in which they maintained a nearby but peripheral position in relation to the group for some duration before interjecting into the conversation. I never observed Tammy and Vince discuss this approach, nor did either ever state it explicitly to me; however, Tammy's adoption of this physical aspect of Vince's practice suggests the kinesthetic quality of Tammy's learning from Vince.

Recall as well Kimberly's use of Bonnie's strategy of following every student's response with another question until the student arrived at an answer she wanted the

student to have. This acquired technique had a physical component to it as well. One morning both Bonnie and Kimberly were tutoring students before school—Bonnie at her desk in front and Kimberly at a table in the back. While the intern and mentor looked nothing alike—one was middle-aged, Caucasian, wearing jeans and a vest with a long gray ponytail and the other a sharply dressed 22 year-old Asian-American —I was struck by how similar they looked and acted. Both were sitting low, lowering their eyes to or below the students' eyes in order to make eye-contact easier, and both engaged in dialogue in which they followed every student response with a question. When the student finally arrived at the right answer—for example, saying "It went up by 75 degrees"—Kimberly and Bonnie lifted their eyebrows without saying a word, which was the cue for the student to write down the answer on the paper in front of them. The physical resemblance was remarkable.

Managing the Material World like a Teacher

Interns also managed the physical space of the room and students' bodies within that room. For example, one of Tammy's self-identified challenges was managing students' movement during group activities; Vince's and her use of inquiry and their relational style of classroom management meant that students had a great deal of freedom to choose where they worked and how. However, despite the relative freedom students experienced, Vince and Tammy were actively monitoring the classroom. When a boy and girl began spending more time cuddling and touching each others' faces than working on the lab, Tammy slowly worked her way to their table and began a conversation with them that got them back on track. Likewise, when two of Kimberly's students who had finished their work and were roaming the room to help their students (with her

permission) turned their attention to flicking rubbing bands at one another, Kimberly quickly instructed them to return to their seats. All interns were charged with the tasks of managing and monitoring students' placement and movement. And they picked up the moves quickly.

Not surprisingly, this kind of attention to students did not occur only in the spur-of-the-moment. Interns planned classroom activities, set up labs, and designed seating charts. Each task required that interns take account of the physical space of the room and the students within it. One morning before a lab, I came into the room to find Cindy standing in front of the room visualizing how students might move throughout the day. For the lab, she needed hot plates for boiling water used for testing food for the presence of sugar. While she originally had the plates set up at the students' lab tables, she later moved them to the tables set up around the perimeter. She was "worried that they might spill the water" if it was in the middle of the group. On the side of the room, "it might be safer." Cindy's work in this instance involved her considering how the room's arrangement might interact with the 25 adolescents whose behavior she had come to know well. Later, when Shannon came into the room shortly before class, one of the first things she told Cindy was, "Oh, good. I was going to tell you to put them (the hot plates) on the side tables so they didn't get knocked over." When Shannon left the room again to get her mail, Cindy gave me a big smile.

Kinesthetic-Conceptual Assistance

I previously described how interns were surrounded by real-time assistance and feedback. Sometimes that real-time assistance and feedback had distinctly physical or spatial components to it. When Vince "stepped in" at Tammy's request to help with the

pond water apparatus, he was making sure that the lesson continued uninterrupted; in addition, Tammy was able to observe Vince complete an important physical component of the lab activity. Later in the day, she completed the task without his help. Likewise, when Bonnie stepped in to prevent Kimberly's students from herding to the door like cattle, her assistance focused on the space in the room and students' bodies within that space. When cooperating teachers "directed interns' attention," that attention was often toward students' physical actions. Vince pointed out to Tammy how some of her students were horse playing and Frank signaled to Chad to wrap up a discussion and move increasingly bored students to the back of the room to start working. In real-time, cooperating teachers helped interns notice and manage the complexities of a classroom full of many students in a confined space.

The assistance with this complexity was not only in real-time. Mentors helped interns plan for the physical dimension of the job and retrospectively engaged interns in discussion of the physical aspects of previously taught lessons. In an early lesson, Chad and Frank had planned a lesson in which the class seating chart (consisting of rows and columns of desks) was used as an analogy to the periodic table (consisting of rows and columns of related chemical elements). The idea was that students would move around the room and sit down based on information given to them on an index card. As Chad and Frank discussed the activity in the minutes before students came in, Frank realized that Chad was having trouble connecting the written chart with the physical arrangement of the room, primarily because Chad's chart was missing the lab tables in the back of the room. To assist, he told Chad to place the chart on the document camera so they could both see it; "So, find the door and the demo desk. Got it? OK. So as long as those are

lined up in the right spot, you'll have it where you need it. It's tricky because, for you, it will look upside down." In his help, Frank assisted Chad in translating the three-dimensional layout of the room into a two dimensional map, a task Chad needed to help students do to complete the lesson.

As interns and mentors talked through and planned lessons, mentors mentioned the physical often. Ken described how he wanted Heather to conduct a formative assessment: "You don't need to collect it or anything. Just do a quick over-the-shoulder check" to see how students were doing on the assigned problem. Bonnie and Kimberly discussed during their planning hour how they would handle a student who had been giving Kimberly trouble the last few days: "But anything that comes up, any disturbing behavior—Boom, I'd move him to the hallway." It was also quite common for interns and cooperating teachers, especially before labs or group activities, to talk through where they would place materials and arrange desks or tables in the room. Vince and Tammy debated whether to put indicators at the lab benches or require students to get them from the back table. Ken and Heather rearranged the seating in the room to give a student with emotional disabilities a clear space in the back of the room to pace if he needed it. The physical aspects of teaching, the managing of space and bodies and materials, were a central component of intern-mentor planning.

So too in reflections on lessons after the fact. When they retold stories of what had occurred, interns often recounted dialogue (e.g., "and then she said this" or "I told them to" or "when he asked whether or not"). Somewhat less frequently, they described students' physical behavior. Heather described how "Kirk did that pacing thing again today. Everyone just seemed to ignore it today, so that's good" and Kimberly relayed to

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Bonnie how "Mark wouldn't give me the phone and he just walked around the room. Finally, I went to him and put my hand out. He gave me the phone then, but I could feel myself shaking inside. It seemed like it took forever."

Mentors would listen, relay what they might have done, how they might have responded, or suggest ways that the intern might proceed. Interns and mentors would work to solve interns' problems, including those that involved the physical dimensions of teaching. Much less commonly (I have only three examples), the conversation would shift to a more "meta"-level in which the mentor suggested heuristics or principles that the intern might follow in regards to managing the physical spaces of the classroom. For example, following the lesson in which Vince stepped in to remind Tammy to put the sheet she was reading from on the overhead camera so students could see it, Vince told her "You need to remember to put what you are working on up on the screen so kids can see it. Having the visual up while you are talking about it makes a world of difference. It helps them focus." Vince not only explains how he would have conducted the class or solved the problem, but also describes a rule-of-thumb (keeping things visual) for Tammy to follow in the future.

The work of teaching has many physical dimensions; teachers strategically hover, raise and lower their voices, lock eyes or wink. They also manage students and space. Interns watched their mentors' teach in physical space, taught in that same space, even mimicking at times the ways their mentors moved and acted. And mentors attended to this in their comments to interns, even on occasion connecting the physical components to more general heuristics that interns might follow in ways that make explicit the "kinesthetic-conceptual" nature of the work (Rose, 1999).

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Solving the Problem at Hand

Interns work in schools had a distinctly task-oriented nature. This task orientation has three components to it. First, interns and their mentors almost always worked on concrete problems. Second, the work on those problems was highly contextualized; interns were planning lessons for particular students, within the boundaries and expectations of a particular mentor, with particular materials, for particular times of day. Finally, when principles or concepts were suggested or applied to the problem at hand, they were of a heuristic or rule-of-thumb nature.

With the exception of time spent teaching in front of students, working together on concrete tasks was the most common things mentors and interns did. Science teachers have lots to do, and interns and mentors did it together—writing quizzes and tests, grading papers, composing emails, or preparing for labs. Tammy and Vince were sitting next to each other in front of the computer when I arrived one morning; Vince typed and Tammy sat in the chair next to him. She looked at a review sheet they had distributed to students, while Vince pulled up the test that he gave the previous year. Vince says, "I put this one on last year, because I wanted the kids who maybe had some of it down but not all of it could should what they know." Tammy agreed to keep it and they worked to alter last years' test to better account for how they taught the unit this year. When they finished, Tammy showed Vince the lab reports she was grading, asked him to look at a few students' responses and he told her how many points he would give and why. Writing tests and grading papers are part of life for teachers. Sometimes they accomplished these tasks as a pair while other times the intern would complete it on their own and seek guidance as necessary.

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On another morning at Vincent High, Cindy quietly worked at her desk before Shannon arrived. When Shannon showed up, she did so with a flurry of activity: "Sorry, my run went long this morning. We're doing the brain dissection this morning with my first bell, right? Can you give me a hand?" As Cindy set out 10 dissection trays and kits around the room (at Shannon's direction), Shannon pulled down boxes from shelves above the cabinets to find the box of brains: "Where are they? Have you seen them? I know I ordered them—I remember giving Sharon the invoice." Before long, Shannon and Cindy were standing on chairs looking in every box in the room and back stockroom. When Shannon finally found a box of brains, it was last years'. Only 10 brains were left, five for each class (half of what Shannon hoped to have) and there were only five minutes left before first bell began: "Okay, I guess we'll have to have them in groups of five now." Cindy asked, "You want me to put the other five trays away?" "Yeah, I suppose. I'll have to make sure they all get a turn to see it." When the students arrived, Shannon apologized for the shortage of brains and told students, "Just because there are five of you in a group now doesn't mean that one or two of you should do all the cutting and probing. Make sure everyone takes a turn." The mad scramble for brains certainly was not an everyday occurrence, but the task of setting up for labs and improvising based on the available materials was fairly common. In this case, Cindy assisted Shannon in preparing for her lab including modifying the plan and then watched Shannon present those changes to students.

In both of these vignettes, the work that interns do with their mentors is concrete, timely, and particular. The tasks need to be done for the classroom to function, they must be done soon because the test is approaching or the students are arriving, and they are

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tailored to the situation at hand. Vince and Tammy are not writing *a* test; they are writing a test for their students who have had particular instruction in a particular year over particular content. Shannon and Cindy are not designing *a* lab; they are getting sheep brains and dissecting kits ready for students who arrive in five minutes, and they cannot find the box Shannon ordered.

The passage below highlights those same ideas. Frank and Chad write a quiz together while sitting around Frank's computer. Frank types and Chad watches over his shoulder.

Frank: Give me one more.
Chad: How about one of the covalent ones? We don't have one of those yet.
Frank: Yeah, that's good. Maybe a tougher one like silicon tetrachloride that might make them think. Hey, did you see when Josh came up during the lab and said "What's this stuff on my hands?" And I said (dramatic pause, very slowly) "You are going to die." And then I added "Someday." (Chad and Frank both laugh.) How about magnesium sulfate? Would that work?
Chad: Oooh, a polyatomic ion, that'll hurt them.
Frank: OK, we got it.

Again, Frank and Chad are writing the quiz with a particular class in mind. There was not a discussion of general principles about quiz writing or assessment; Frank does not make explicit how he is choosing items including why, for example, he selects magnesium sulfate. This, of course, does not mean that general principles are not at work and one could see how Chad might infer some of those principles. Chad suggest that "a covalent one" might be good likely because the other quiz questions were all of another type (ionic) and Frank affirms that decision. As well, Chad may draw the lesson that ending the quiz with a harder question should be a general rule.

I also include the seemingly off-topic story that Frank told in this example because it illustrates the everyday nature of this task-oriented work between interns and

mentors. These pairs shared a classroom together for almost eight months—like getting "a college roommate" again—and the work interns did with their cooperating teacher was intermixed with simply "living" with another person —sharing stories, complaining, telling jokes, and, at times, bickering and conflict. Planning, writing assessments, designing activities, setting up labs, intervening with problems students, writing emails to parents—these were structured not as discrete activities in which interns and mentors set aside blocks of time to accomplish a specific task; instead, interns and mentors did these things in the flurry of a day at school. Setting up a lab together included colleagues stopping by to chat, answering a ringing phone, gossiping about students, describing a TV show they had watched last night, giving updates on plans for a summer wedding, as well as giving advice on how to mix a solution, arrange desks in a classroom, or keep Frankie from distracting the rest of the class.

Let us finally consider an example from Kimberly and her mentor Bonnie.

Kimberly: Boy, Ashley came in with a bad attitude today.
Bonnie: I bet I saw and asked three times for her to put the make-up away. The scores for that group (5th hour) are going to be ugly. And then we are going to have to make some phone calls.

Conversations between mentors and interns often started this way. A troubled student, a commonly missed question on a test, a demo that did not work as planned—interns bring a problem to their mentors and the two begin to work on it. Following this initial exchange, the conversation turned to the use of a "yellow-card" warning system that Kimberly and Bonnie had developed for classroom management:

Kimberly: I kind of feel like with first and second hour, we can push them a little bit and they'll respond. They'll get back to work when we ask them.
Bonnie: I would have booted a couple of kids today in 5th hour. I would have moved through the steps (of the yellow card system) much more quickly.

Kimberly: I hate that. After the fact, I always feel like I should have handled it differently.

Bonnie: I know. I know. But the thing that you're getting much better at is recognizing it and you are much better at just stopping and waiting for kids to get quiet. I would have given one (a yellow card) to Nathan. He doesn't give any other kids any wait time; he just blurts and blurts. It is just as disruptive as anyone else. They are going to be in for a rude awakening on this test. (She walks to the printer to get a copy of the test and gives it to Kimberly.) We're at a point in the year with them where there just isn't a student who doesn't know what needs to be done. They have many choices, but they have to be the one to decide to do what they need to do.

Kimberly is really struggling with 5th hour, especially in comparison with the earlier classes; this class, in Kimberly's view, responds differently and she needs a new technique for working with them. Bonnie's response addresses the issue of 5th hour directly; she would have "booted . . . kids today." She refers to a situation with Nathan who keeps blurting and describes how she would have handled him, advice she could have given only because she was present in class, had seen Nathan's behavior, and realized he had passed her threshold for receiving a yellow card. While this assistance is not in real-time, Kimberly and Bonnie both experienced the same class and, as a consequence, Bonnie is able to point out concrete details.

The conversation then turned to another student in 5th hour, Nikki, who had been absent for several days and had been, in Kimberly's opinion, much less interested in getting her make-up work than Kimberly would have liked.

Kimberly: It was like Nikki didn't even know when she was absent.

Bonnie: Did you see a note (an official excuse note from the administration) for Thursday? I didn't. . . .

Kimberly: Part of me just wants to give them the papers—here you go, let's get started on the lesson.

Bonnie: But every time you do, you enable this pattern of behavior. I'm confident that kids can do this and that's where we set our expectation.

A few minutes later, the conversation shifts to another student, Lamar.

Kimberly: So this was Lamar's second yellow card. Should I call home?
Bonnie: It's Monday. A new week.
Kimberly: OK
Bonnie: But anything that comes up, any disturbing behavior—Boom. I'd move him to the hallway. And if there are problems there, we went through the steps. We have been fairly lax on the consequences. We've tried the positive consequences.
Kimberly: One of the things I hate about myself is the posing of these threats. It's like I'm always threatening them. That's what 5th hour seems to have figured out.
Bonnie: But you have to let kids know the consequences of their action or what you do will appear arbitrary to them.

Each of these two final comments by Bonnie has a different quality, as they apply more broadly than the particular student (Nikki) or class (5th hour). In the first example, Kimberly begins that transition to the more general by switching the conversation from Nikki to "them" and Bonnie then describes her idea—that giving kids (more generally) things is enabling students to continue in undesirable behavior and high expectations will help change that behavior. In the second example, Kimberly is still talking about 5th hour and her feelings around threats when Bonnie makes the transition to the rule-of-thumb—kids (again generally) need to know the consequences up front or you will appear arbitrary. These rules-of-thumb arise in the process of the mentor and intern trying to solve an important problem in Kimberly's class rather, it seems, than from Bonnie's intention to teach the rule of thumb. Kimberly raised the problems and directed the conversation based on her recent experience, and Bonnie, in her attempt to help encourage Kimberly to engage in a particular kind of teaching, shared some general rules that she thought would be helpful for Kimberly to remember.

Other mentors gave this kind of principled advice, most often (as in this example) following a lesson and arising from a discussion of some event or problem that had just occurred. For example, after a lesson in which Vince had reminded Tammy (in real time)

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to put her handout on the document camera for students to see, he told her that "you need to remember to put things up so that kids can see it. Having the visual up while you are talking about it makes a world of difference. It helps them focus." Likewise, during a planning session for a review game, Frank and Chad are discussing some of the more or less competitive options that Chad might use. In the end, Frank told Chad that it was his decision and he could choose whatever format he wished, but he should remember that "the more structured these things are, the better it is." Like Bonnie's assistance above, these statements arose from a problem (kids not being able to see) or a task (preparing for a review game) that the intern is working on and the mentor used the situation to give the intern a more general principle that might guide their decisions or actions. The source of these principles given by the mentor was never made explicit. No mentor referred to research findings or a book on teaching. Instead, these principles seem to derive from mentors' experiences with situations similar to the one the intern is experiencing.

Returning to Interns' Ecology

As I end the analysis of interns' professional lives in schools, I return briefly to the ecology of the intern. In Figure 4.1, the interactions between cooperating teachers, interns, and the school/classroom context are highlighted and will be used here to summarize. First, interns interact with the interaction of their cooperating teachers and school/classroom context. When an intern watches her mentor teach, gathering his scripts and patterns, she is not watching her mentor perform a solitary act. Instead, her mentor is planning for, responding to, and creating with the students in the class, all of whom are embedded within a larger school culture. Second, as interns and mentors accomplish tasks together, write tests, and set up labs, they work with their mentors, learn from them,

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get advice and feedback from them in concrete ways. Third, interns interact with the school/classroom context as they teach. When they assume the stances of teachers, look like teachers in front of students, and lead instruction (even instruction that mimics or follows their mentors), they interact with the students and school. The act of being a teacher—of embodying one—may shape the teacher they become and that process occurs not in a generic school, but at Randolph, Vincent, or Quincy High, not with generic students, but with students they know very well.

It may be, however, that an important arrow is missing from Figure 4.1—one that would connect the cooperating teacher to the interaction between the intern and the school/community context. When interns teach and receive feedback and assistance in real-time and are directed in ways to use their bodies and space, mentors intervene in that interaction in ways that shape the experiences that interns and their students have. Though interns are learning to teach in school, they are learning in an interaction with that environment that has been shaped and modified by their mentor.

As we saw in Chapter 3, this school portion of interns' ecology seems to have a substantial influence on the practices and beliefs of interns. It is not, however, the whole story. State's teacher education program, including the field instructors and course instructors, creates its own world with different kinds of socializing pressures. We turn to an analysis of it next.

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Chapter 5
Learning to Teach in Teacher Education

Most teachers learn to teach in and between the university and the field. Thus far, we have considered the field; now we turn to the university. The practices that interns engaged in and the support they received when they were with teacher educators, and in settings most structured by teacher education faculty, differed in fundamental ways from their practices and support in their school placements. While the school placement is a part of an intern's teacher education program, for this study I identify the teacher education program as those components of the internship populated by members who identify first and foremost with State's program—the field instructors and the course instructors. Figure 5.1 below highlights the components of the ecology under analysis for this chapter.

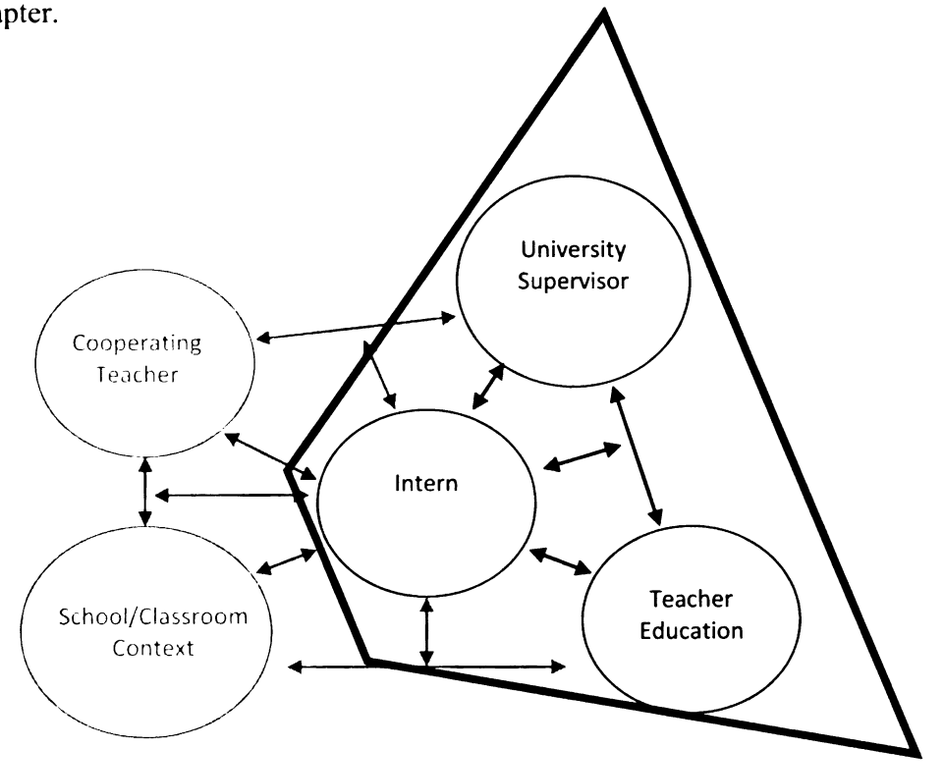

Figure 5.1. Narrowing in on the teacher education side of the interns' ecology

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I begin with the thesis of this chapter. While interns receive real-time feedback and support as they engage in teaching in their school sites, when in teacher education, interns are supported in reflection and analysis removed from—but grounded in— the moment of teaching. While in school sites, interns take on and pay attention to the kinesthetic and physical aspects *of being a teacher*; in teacher education, interns take on and pay attention to the kinesthetic and physical aspects *of being a student*. Finally, while in the school settings interns use and are supported in their use of their experiences and challenges as opportunities to engage in task-oriented problem solving, in teacher education, interns are supported in connecting their experiences with more generalized ideas about teaching. This chapter will describe those three important dimensions of teacher education.

Reflection, the Hallmark of Teacher Education

One cannot open a journal, a course syllabus, a curricular catalogue, and—increasingly—a criticism of teacher education without seeing the word "reflection" multiple times. Its omnipresence is both striking and troubling. Indeed, Fendler (2003) argues that when one talks about teachers engaging in "reflective practice," it is best to be cautious because of "reflection's many faces" (p. 17). She argues that

> today's discourse of reflection incorporates an array of meanings: a demonstration of self consciousness, a scientific approach to planning for the future, a tacit and intuitive understanding of practice, a discipline to become more professional, a way to tap into one's authentic inner voice, a means to become a more effective teacher, and a strategy to redress injustices in society. (p. 20)

For Fendler (2003), the prevalence and shifting meanings of the term calls into question its utility.

Both the goals of "creating reflective teachers" and the pedagogies of reflection were a prominent feature of State's teacher preparation program. In fact, one of the most prominent features of the TE experience for interns was the emphasis on engaging in "reflection," although—as Fendler would predict—what instructors meant by that, and even whether they used that specific language, varied. From the array of meanings of reflection described by Fendler, I observed two key facets of reflection in State's teacher education program: 1) a systematic and rational (even scientific) examination of practice and 2) an introspective look at one's own practice. I'll describe each below. This admittedly means that I have cast a large net in identifying "reflection" within State's program, but this characterization parallels the varied meanings of reflection identified by Fendler within the larger literature on reflection and reflective practice.

"Let's look at the situation using our steps": Systematic Rational Reflection

Interns in State's program are coached to engage in systematic and rational examination of their teaching practice. This emphasis is most common in course assignments in which interns engage in a step-wise and bounded process for examining their practice or for making changes in their teaching. Both TE Professional and TE Science expected this kind of reflection, although the steps of the reflective process varied between the classes.

In the professional responsibilities class, the guiding systematic framework for examining one's practice was based on the work of intern-created case studies (Sykes & Bird, 1992). In this class, "working on a case" involved interns following six steps for investigating and then attempting to solve a persistent classroom problem. First, interns were expected to describe their motivation for investigating the problem they selected, in

essence answering the question "What prompted you to care about this aspect of practice or the student you have chosen to investigate?" Second, they described the situation. Instructors consistently pushed interns to hold off on interpreting during this step and instead focus on what the behavior, student, or problem looked like. This step emphasized trying to paint a descriptive picture of the problem before assigning a judgment or interpretation as to the source of the issue.

Only once interns thoroughly described the situation were they permitted to proceed to the third step of interpretation. Here, interns were encouraged to suggest multiple interpretations for the problem they described. For example, if an intern described a student not completing homework, she might identify as possible interpretations a lack of organizational skills, a lack of motivation, or a life situation at home which was getting in the way. The fourth step involved identifying the stakes involved in the problem and any possible solutions, not only for the student at whom the intervention is directed, but also for the intern or the other students in the class. Fifth, interns identified and implemented a plan of action to address the problem. Finally, they assessed the effort made and the results of their interventions.

These steps served as the six sections of the major course paper used in the professional responsibilities course throughout the year. Interns were evaluated on the degree to which they completed these steps well. For example, the feedback provided to Heather by Cathleen indicates what Cathleen was looking for (the steps of the process are bolded, emphasis added):

> Nice analysis, Heather. You begin with a balanced **description** of worthwhile problems, then **analyze** each of these problems with care and insight. Next, you turn **to stakes and alternatives**, carefully mapping out your thinking for the reader about what's going on, why it matters and what you might reasonably do to

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> address it. You then **reflect on your implementation**, which highlights the ways your teaching is becoming more responsive to individual student needs. I'm really glad to know that things with Richard improved, however I was saddened to note that things only got worse for Bryan. While you did the right thing by recommending him for assessment, that alone doesn't help you to help him when he's in your class. I wonder what role holding "high expectations" might play in supporting kids like Bryan?

Will connected his feedback even more tightly to the framework by providing the feedback directly after each section of the paper. He wrote to Kimberly:

> Good description – but it would be helpful to discuss at least briefly your impressions of the level of understanding that the two students have. Besides not doing work, what difficulties do they have in understanding the content? . . . You have introduced several reasonable hypotheses, connected to the description – good. . . . It would be good to also consider the stakes for the rest of the class and for you, as their teacher and as a student of teaching. . . .You have explained several good options, although it would be helpful to develop them more completely. . . . Nice description of the implementation. I would like to see more reflection as you assess the effort.

Across all the interns and instructors of the professional responsibilities course, these six steps served to guide the most important assignment of both semesters. Note here too that both Cathleen and Will isolate the process of "reflection" (at least in this particular feedback) to the final step in which interns assess on how their implementation, though many scholars would include the entire process under the umbrella of "reflective practice" (e.g., Jay & Johnson, 2002; Loughran, 2002; Mansvelder-Longayroux, Beijaard, & Verloop, 2007).

Instructors also used this framework to structure interns' discussions with one another in the university seminars. In seven of the twelve TE Professional class sessions I observed (including all three instructors), interns were asked to discuss problems they were dealing with in their internship using this framework. Sometimes this was done in large group format. For example, in one class led by Will, Kimberly was telling the class

about a male student who was speaking inappropriately to her during the first week of school. The student pestered Kimberly about disclosing her first name and when she told him that she might tell him later, he asked her (in front of a group of students), "Can I find out later tonight?"—a comment she interpreted as sexual innuendo. The same student told Kimberly that she should call him "Daddy" or "Big D."

As Kimberly shared the story, the other interns in class were full of questions: "How does your mentor handle it?" "Were students assigned seats?" "Were there established classroom routines or procedures to address this?" Kimberly tried to respond to each by providing additional pieces of the story. After several minutes, Will stepped in and said,

> OK, so let's take a look at Kimberly's situation using our steps. (Pointing to the board) What we've been doing here are the first two steps of this process, describe and interpret. Let's go ahead and record some of our interpretations. What are our interpretations of "Daddy" and "Big D"?

Interns suggested the situation between Kimberly and her student might be one of several things. Perhaps it was a power struggle or maybe attention-seeking behavior. On the other hand, the student may want a personal relationship with Kimberly or was compensating for a lack of school knowledge. Once the interns shared various interpretations, Will led a discussion of the stakes involved or possible consequences of this problem (step 4) for Kimberly and her students. The other two professional responsibilities instructors (Sandy and Cathleen) used similar whole-class formats, structuring the discussions by either implicitly or explicitly using the six step frame.

Interns also used the frame in small groups. A regular format was to group interns and ask them to share (using the steps) an issue from their internship. These discussions were sometimes organized around a topic (for example, classroom management or

working with parents) and sometimes around a student of the interns' choosing. In either case, instructors emphasized the importance of following the steps and set boundaries on the discussions. For example, Cathleen organized interns into groups to discuss a particular student's problem. She set ground rules for their discussion, emphasizing the need for the intern "to first describe as crystal clear as possible" the situation without interjecting his or her interpretation of what is occurring. Then, Cathleen cautioned, "you need to sit quietly and listen" as the other interns in the groups share their interpretation of what is occurring. "Don't talk during this time." Once the small group had started, the group I was observing quickly began a free ranging discussion of the first intern's problem that included the group members' interpretations but also a multitude of possible solutions and interventions the interns might try. The describing intern did not sit quietly; as one intern would offer an interpretation or solution, she jumped back into the conversation to offer additional information, her own interpretation, or some reason why the intervention proposed would or would not work. Cathleen likely noticed this occurring in many of the groups because she flicked the classroom lights to get the interns' attention:

> It is so easy to want to jump in there and clarify things, isn't it? To try to guide your classmates' interpretations? But teachers report that when they see how others are misconstruing things, the assumptions that they make, that this can be really eye-opening for you to see how others hear what you are saying. So please, try not to say anything and just listen to what your group is saying.

Like Will's management of the whole class discussion, Cathleen attempted to structure the interns' discussions to be more systematic and disciplined, to follow the steps of the process rather than allowing the discussion to take its unguided course.

The TE Science course also promoted the systematic examination of practice, particularly through its course assignments, though it used a different set of steps. For example, in the inquiry course assignment, interns were expected to design and implement at their school site a series of lessons that used an "inquiry approach." To report on this work, they were expected to describe the "story of what happened," "analyze student work," and describe the way in which they designed and implemented aspects of inquiry, like questions, evidence, and students' explanations. Each part included sub-steps. For example, when analyzing student work, students were to: 1) describe the assessment task, 2) generate an ideal response of a hypothetical student who understood the content well, 3) summarize the patterns in the actual student responses, 4) analyze their effectiveness of instruction, and 5) summarize what they would change next time they did it. As before, this assignment structure suggests that better thinking about instruction comes when these steps are followed. Before, the assignment seems to say, a teacher looks at student responses, they should think about what they hope students might be able to say. And before making a judgment about how effective instruction was, one should look at student responses. And before thinking about what they would do if they taught the lesson again, one should analyze the effectiveness of their instruction.

In sum, in both yearlong classes that interns took at the university, teacher educators were asking them to engage in a form of self-study, "the intentional and systematic inquiry into one's own practices" (Dinkelman, 2003, p. 8). The assumption here is that good teaching puts "reflection at the center" (p. 8) of the work; that is, good teaching requires taking a "mindful," or intentionally thoughtful approach to thinking

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about one's teaching, and entails adjusting one's practices in response to the systematic and intentional inquiry.

Fendler (2003) argues that reflection that stresses systematic thinking resonates with Dewey's arguments for a more scientific and rational way of generating knowledge about teaching. As Dewey (as cited in Fendler, 2003) says "reflection thus implies that something is believed in (or disbelieved in) not on its own direct account, but through something else which stands as witness, evidence, proof, voucher, or warrant; that is, as ground of belief" (p. 18). The steps that teacher educators take interns through are intended to promote that kind of belief with evidence or warrant; decisions about which intervention to try come by considering the situation almost as data and then analyzing the results before deciding on success and subsequent steps one might take. However, as Fendler (2003) would predict, another important "meaning" of reflection arises in State's program. We turn to that meaning next.

"This was a horrible day": Introspective Retrospective Reflection

A second form of reflection that teacher educators asked of interns was an introspective and retrospective recall of one's experience. Unlike the systematic (or scientific) version of reflection described above in which interns were encouraged to plan for action through steps, this version of reflection encouraged interns to make explicit their thoughts, feelings, motives, and responses to practice they had already engaged in. Future action might be included in this reflection, not as a result of a rational systematic decision (e.g., considering alternatives, identifying the stakes, etc.), but as the product of looking into one's self.

The predominant pedagogy used to encourage this style of reflection was weekly journals that interns wrote and sent to their field instructor and, in some cases, their TE course instructor. To my knowledge, the guidelines for writing journal entries were loose; the primary requirement was that interns send them weekly and that they were to be used, in Sam's words, "as a place for you to reflect on what you have been doing." The field instructors responded to the journals with comments, suggestions, or questions.

As I described in Chapter 2, I collected 98 journal entries written by interns, 55 of which included the responses interns received from teacher educators. In analyzing these journal entries and responses, three themes emerge. First, interns replayed classroom events and teacher educators responded with additional questions intended to promote interns' thinking. Second, and related to the first, interns often forecasted how they would change something about their practice based on the outcome of the story they told. Finally, interns used the journals and were encouraged to use the journals to put their emotional responses into words. Thus, journals were alternatively used as mirrors, assessment or evaluation tools, and diaries.

The most common component of introspective reflection was the sharing of self-nominated significant events from practice. Over 80% of the journal entries re-told a story from practice. Unlike the more structured or systematic case study assignments described above, there was no externally-imposed structure. Descriptions were mixed with interpretations which were mixed with possible next steps. Holly described a situation below from November:

> A second disciplinarian issue for me this day, Friday, was when I took Jamal out into the hallway because he was acting so very aggressive all day. He was short fused when the hour started, and I had to break up some "male aggression" going on inside of the class, and later when everyone was working independently he

> kept being so short tempered. After watching him draw some gang sign on the chalk board I took him in to the hallway to ask what was going on. He talked about being disrespected when someone took his chair and said if that happens again, he had no choice but to . . . There were a few things I mentioned to him about having a choice, and then it came time to address the gang symbol. I told him that we represent our school by showing our colors, but we couldn't represent ourselves using those symbols that he drew on the board. I felt like my father. This is the way he would talk to me—very indirectly, and expressing to him "you can't do this." I had NO IDEA how to handle the situation. I can handle fights, but taking preventative measures about that gang sign, I just have no clue.

Holly does not try to describe this situation before interpreting. For example, it is not clear what "male aggression" or "short tempered" look like, only that Holly clearly interpreted it as threatening and potentially dangerous. She does not offer alternative interpretations of the situation, but instead jumps to solutions to the problem, or in this case, her lack of a solution.

In another example below, Cindy describes a situation and quickly settles on an interpretation without considering alternatives:

> This was the second day that fourth hour was in the library working on their research project. I am quickly discovering how difficult it is to keep students on task when they are placed in front of a computer. I ended up spending the majority of the hour walking around and asking students to get back on task. There is a music download program that for some reason is not blocked and this is where the students want to spend all of their time. It is so frustrating having to continually monitor certain students to make sure they are doing what they should be. This indicates to me that the lesson is not engaging enough but recently nothing I seem to do engages them.

She uses the rest of the entry to describe a possible solution (participation points):

> I think beginning next semester I'm going to give participation points for being on task in class. Without participation points there is no consequence for student misbehavior. They surf the internet when they are supposed to be working, they never work on their bell work, and they are constantly starting side conversations. Once again I am afraid that these behaviors are a consequence of students not being interested in the material. I need to find a way to solve this issue.

Her field instructor's response to Cindy was prototypical. She acknowledges the struggle and poses some questions:

> Motivating students is not easy. . . . I would recommend you starting from the easiest place. When do your students show their interest most, work hardest, and learn best either in your lesson or in Shannon's lesson? What about observing or thinking about (this situation) while having this question in your mind?

She does not push Cindy to be more systematic, but instead points Cindy toward her own experience and her own thinking as the source for answers or solutions to practice. Another field instructor, Sam, would often take a similar tack and ask interns questions that required interns to look more at their own lives or teaching practice. For example, he commented to Holly that "it's important to have some balance and not miss out on life. How can you reduce your work that goes home from school?" and "Now, how have you been able to help your students become critical thinkers and ask the important questions?" In both cases, no systematic examination of a problem was required. Holly and Cindy were encouraged to look inside.

In addition to retelling stories, interns also use the journals to engage in future-oriented thinking. Sometimes this involved interns describing new strategies they will implement in the future. Cindy's discussion of participation points above serves as one example of that kind of work. She described a situation in which she struggled with a problem and then uses the journal to propose a change she might make in the future. Likewise, Holly described a confrontation she had with a young man in class (a different but remarkably similar confrontation than the one described above) and then uses the lessons of the experience to propose future action:

> I then confronted him about what he was writing on the chalk board, as he looked back at me with confused eyes like he didn't know what I was saying. All the while I couldn't help but sounding like a parent telling him that what he was

> doing was inappropriate and he needs to "grow up" from that. That wasn't really what I wanted to say but found myself getting caught up in the disciplining that I started resembling my parents and how that sounded to me (NOT the impression I was trying to give off). This instance gave me a starting point to think about how I'm going to handle these kinds of situations in the future, and how it will take maturity on my part to speak to the student in a way that's effective and loving at the same time. Next time I would like to show the student what his or her possible options are and what the outcomes of those choices would be. I need to speak in a way that will relate to the student while showing concern at the same time.

Other interns used language like "I wasn't really happy with how things went, but I have been able to reflect on what I would change" (Cindy) or "When I teach this unit again, there are two main changes I would make" (Tammy) or "I hope that in the future I can give . . ." (Chad) or "I am still sorting out my thoughts, but I would like to try some new ways of presenting for the next unit." (Kimberly). At the end of each story, the most common follow-up was for interns to talk about what they had learned and what they might do the next time they taught a unit, dealt with a parent, or engaged with a particular student.

This kind of reflecting was explicitly taught and encouraged, particularly by field instructors. For example, at a meeting with Sam and five of his interns, he gently chastises them:

> Thank you for sending your journals to me. This is just a reminder to be a little more reflective in them than you have been, ok? Some are just synopses, really, but I'd like to see a little more thought. What went well? Would you have done something differently? What would you do the next time or if you could do it again? Be reflective. Think about the practice of teaching.

Individual events become occasions for reflecting, for thinking ahead using the experience and insight one garnered from teaching. This kind of reflection differs from the more systematic approach promoted in TE coursework. The journal entries did not conform to any step-by-step process for generating new knowledge and there are not any

explicit boundaries placed on what interns wrote about. Instead, it more closely matches Schon's (1983) idea of reflection-on-action in which interns take their practical experiences and generate new personal knowledge from them, not by following a system, but by relying on intuition, experience, and soul searching.

Interns were unguarded and self-disclosing in their journals, often explicitly describing and labeling their emotions. This emotional writing was often commended by teacher educators, though it would not have been appropriate (and did not appear) in a course assignment. For example, early in the year, interns commonly talked about the fear or awkwardness they experienced being in front of students. Chad described how at the end of the first week "the idea of standing in front of my students is still scary, but I think that it shows a lot less than it did before" and Heather shared that "Stress is probably at a maximum right now." Interns described situations in which they felt shame ["I can't believe I said that" (Holly)], frustration ["Unless I get this classroom management under control, I won't be able to teach them ANYTHING (Chad)], guilt ["I realize that you cannot save every student, but does this guilt ever go away? (Kimberly)], or even anger. Cindy used the journal to vent about her mentor: "This was a horrible day and I honestly don't know if I can survive with Shannon anymore. I honestly feel like I'm going to lose it with her." When she finished with a story about how Shannon corrected her in front of her students, she added, "Wow I guess my frustrations finally all boiled out. I needed to do this but I'll pull it together like I always do. Deep breath...tomorrow is a new day and at least I've got my students... they're great!"

Of course, emotions were not always negative. Interns expressed hope, excitement, or satisfaction, though this was less frequent than more negative emotions.

Heather described success she had with a previously troubling student: "Although I'm sure all of our days with him won't be good, I think we have made some really good progress!" Chad said proudly: "They were not just listening. They were active and engaged! At the end of the class, I felt really good. I felt like this was my best teaching experience to date." But positive or negative, emotions were present in journals in ways not seen in course assignments or class meetings.

Field instructors responded to this emotional tone by offering reassurance and encouragement. Consider an example in which Holly was upset because she overheard students criticizing her teaching and worried about its impact on other students:

> And so, I heard it: my first rude awakening to hear a student's opinion of my teaching. Zelda, who was raising her hand, was asking "Where's Mr. Delaney? Where did he go?" And then, "If Mr. Delaney was teaching I would understand this better." Since she speaks so LOUD, whether or not other students shared her sentiment or not, she could have sparked it then. It was a little bit chaotic that day with all of the questions and it was a lesson for me that I need to do some more review at the start of each day.

Sam replied, "Always remember, don't take things personally. Kids will say things whether they mean it or not. It looks like you have done well to make this a positive experience in that you are reflecting on your practice and recognizing areas you would like to work on. Keep it up!" Sam tried to reassure her, but also noted that "reflecting" will make her a better teacher.

Discussion

The practice of reflection plays a prominent role in State's teacher education program, though reflection here has at least two related meanings. Reflection might involve interns using systematic thinking to examine their practice— selecting problems, evaluating interpretations, carefully weighing the stakes, and analyzing the outcomes of

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action—or it might mean looking introspectively into their practice and tapping into the personal, emotional, and contextual aspects of their experience. In either case, however, the opportunities to reflect were grounded firmly in the interns' experiences in schools. They were not reflecting on written cases or theoretical concepts or readings or videotapes. Practice was front and center.

In contrast, however, to interns' work with their cooperating teachers, this reflective work around practice did not take place in real-time. When interns completed course assignments, they were planning for future practice or recalling past practice. They recounted the experiences they had lived rather than living the experiences with their teacher educators. In recounting those experiences, interns leave the physical aspects of teaching and shift to thinking about teaching. This shift signifies another key way in which teacher education differs from the field for the intern and is the topic of the next section.

The Physical World of Teacher Education

In the previous chapter, I described the ways in which the physical and bodily dimensions of teaching were conveyed and discussed in the interns' school placements. Here I contrast that with the ways in which interns used their bodies and voices in teacher education and the physical and material dimensions of interaction between interns and teacher educators.

Interactions with teacher educators and the program occurred primarily in three settings: teacher education classrooms at the university, conferences held at the interns' school sites, and electronically through course assignments and journals. Across all sites, some important themes emerge. First, interns, especially in TE courses, dress, move, and

talk like their students rather than like their field or course instructors. Second, interns sit. This sitting stands in sharp contrast to interns' work in schools. With teacher educators, interns sit in groups to discuss with peers or talk with instructors, sit with field instructors during conferences, and sit in front of their computer screens to complete course assignments and journals. Finally, there is an emphasis on written texts, arising from a variety of sources including the intern, the teacher educators, or outside experts. These texts are often the focal points around which discussion, work, or feedback is provided.

I organize this section by the location of the interactions that occurred between the interns and the program. I begin by describing the teacher education classrooms, follow with an analysis of conferences held at school sites, and end by relooking at the written texts (usually electronic) produced by interns and TE for their attention to kinesthetic-conceptual issues.

Retaking the Persona of a Student: Teacher Education Classrooms

Teacher education courses during the internship year used physical space and asked students to use their bodies in quite similar ways across classes. Two classroom arrangements were predominant. First, interns sat at desks or tables in a circle with the instructor sitting at a table or desk nearest the front of the room with access to a whiteboard or computer console. In this arrangement, instructors led whole class discussions, conducted short lectures, or used the board or projector to convey information. The second arrangement positioned interns at tables where they were part of a group of three or four. Instructors often had interns in these groups to have discussions or work on joint projects.

Of the almost 2600 minutes of TE coursework I observed, interns were in one of these two arrangements for about 2000 minutes. The choice between these arrangements rested with the course instructors. When interns entered the room, instructors had already set up the room or asked early arrivals to help them arrange it before class began. In addition, instructors might transition the interns from one arrangement to the other during class. For example, Will asked his students who had been working in small groups: "All right, let's take a little break, and when we come back, we'll talk as a large group about our readings." When interns returned from their break, they took seats around the outside of the classroom rather than around the smaller tables as they had before.

These two arrangements changed the nature of interns' participation. When seated in a circle, interns often had their laptops in front of them without anyone behind them, most importantly the instructor. While I would not describe the courses I observed as one characterized by interns being unengaged, most interns' laptops almost always had email, instant messaging, or social networking software on and in use. I observed Heather paying her bills online while her instructor gave details about an important course assignment (on which Heather eventually earned an A). All the interns in the study, and the vast majority of the interns in the program, are millennials, described as both fluent with social media and inclined to engage in multi-tasking even during college instruction (Carlson, 2005). When students were seated in groups at tables, interns less frequently engaged in multi-tasking, in part because instructors were walking around. As interns worked in groups, instructors would roam the classroom, listen in on groups' discussions, and occasionally participate. On one occasion, a student was illicitly using his iPhone while his group was working through a case. Cathleen walked up behind the intern and

tapped him on the shoulder. She was clearly annoyed and while I could not hear the entire conversation, the intern looked mildly angry. As he turned the phone off and put it in his pocket, he said "I mean, come on, I've been engaged in conversation all day." Cathleen responded, "That may be true, but we've talked about this before." While the consequences of this interaction may have been different (after all, Cathleen did not confiscate the phone), this scene could have been from one of the intern's own classroom.

In group discussions, interns most often faced each other while talking. They actively listened and while they would follow instructor directions by rotating who had the floor, they often interjected with questions for one another or would add comments about how similar or different their experience had been. Less often but still regularly, interns would work on a project together and huddle around an intern's laptop. This occurred, for example, if they had to design an appropriate formative assessment question about cells or to prepare a pros and cons list for the assigning of homework. Whether facing each other or facing a computer, interns' collegial interactions were egalitarian and nonconfrontational; I rarely saw interns try to assert control of other interns or steer another intern to work differently. This is true even when an intern might be obviously on the wrong track. For example, the intern caught using his iPhone, despite his assertions, did not appear to be listening to his group's discussion. His eyes were down and he was not contributing. The other interns appeared not to notice and no dirty looks or other efforts were used to pull him into the conversation. Only the course instructor took that initiative.

The primary instructional strategy employed by TE instructors was classroom discussion, whether large-group or small. Texts played an important role in these

discussions. While the reading load was relatively light given that interns were teaching nearly full-time, instructors assigned short readings and writing during the week. For example, Sandy asked interns to read an early chapter from *Love & Logic* (Fay & Funk, 1995); when they came to class, small groups made physical representations or models of some of the principles espoused in the chapter. Will used a summary of conceptions of justice that he had posted on the course website as the basis for a short lecture and discussion of justice. In addition, instructors had interns create their own texts in the form of postings on the course website, asking, for example, interns to describe a situation related to classroom management that occurred during the week. Instructors then shared a posting or two using the projector with the rest of the class to launch the discussion for the day. In addition, students in both the professional responsibilities and the science-specific courses often used time in class to work on course assignments, get feedback from classmates or instructors, or work on sections of assignments together.

An outside observer to class would have had no problem identifying who the course instructor was and who the interns were. First, the instructors were always sitting closest to the front of the classroom—the area of the room nearest the board or computer workstation that controlled the projector. Second, during class, interns rarely stood while instructors were often standing. While arranged as a whole group, all the instructors in the study except Cathleen would stand in the front of the class or lean against a table while talking, while the interns were seated in chairs or at desks. While the instructors were quite skillful at having interns talk with one another instead of having all the discussions run through them, the instructors' posture gave them away.

So did their dress. Instructors wore suits, dress pants and shirts, sweaters, skirts, or dresses. Interns wore much more casual clothing. Blue jeans or shorts (depending on the weather), State sweatshirts and T-shirts or gear from the high school in which they were interning, ball caps turned backwards for the men and ponytails for the women—all of these were common on any given Friday in a TE classroom. Interns became students again.

The contrast was often striking; all week I would observe professionally dressed interns in their school placements as they talked about how to arrange the classroom with their mentors, arranged the desks as they wanted them, told students where to sit, stood (in front of the classroom) as they led discussion or gave directions to groups of casually dressed students. Interns corrected their students when they were off-task, monitored their students' attention and behavior, and controlled how long activities might last and when transitions would occur. On Fridays, these same interns would come to class to talk about teaching but take on the role and persona of their students—sitting most of the time, sitting where and when told, engaging in work that someone had planned for them, reading and writing texts someone else assigned, rarely correcting anyone else who was not toeing the line, texting their friends during class, browsing their messages, and dressing like they had as undergraduates.

An Outside Observer: Field Instructors Visit the Schools

While work with teacher education course instructors occurred almost entirely on the campus of the university (or electronically), field instructors' primary responsibility was to visit the interns' classrooms, observe interns teaching, provide feedback, and hold

evaluative three-way conferences between teachers, interns, and the field instructor (as a representative of the program). This all occurred at the interns' schools.

Field instructors visited interns' classroom approximately once every two weeks. Visiting entailed watching one period of teaching (e.g., 3rd hour or 6th bell). If the schedule permitted, immediately after the lesson, the field instructor and intern would meet to talk about the lesson for approximately 30 minutes. On those occasions where the intern could not meet immediately after the observation, field instructors would return to the school later in the day. For Sam, this post-observation conference usually involved the mentor teacher; Hee-Sun usually met with her interns one on one.

When field instructors arrived in the classroom, interns would typically greet them as they entered. More organized interns would immediately hand the field instructor their focus class binder (a collection of materials including unit and lesson plans as well as past evaluation and observation reports). Once when Hee-Sun brought a field instructor-in-training along with her, she commented that "Tammy is so organized; she always has her binder ready for me." More often, field instructors would need to ask the interns for the binder. On several occasions, I saw interns (Heather and Holly) huddled over their focus class binders during their planning periods in preparation for the visit, despite the fact that the binder was meant to be a repository for work the interns were doing on a regular basis. After they arrived, field instructors took a seat in the back of the room, thumbed through the binder, and looked at the lesson plan for the day. In the post-conference, this lesson plan might serve as a topic for conversations—"I noticed that you had planned to do . . ." or "Why did you choose this as you objective?" In addition,

missing pieces of the binder would be brought to the intern's attention. Sam, for example, questioned why Kimberly did not have unit plans in the proper format.

Once class had begun, interns and field instructors would rarely interact. Unlike the cooperating teachers who provided real-time assistance by stepping in, directing interns' attention, or smoothing things over, field instructors generally kept their distance. From the back of the room, they kept a running log of the lesson on triplicate paper (one for them, one for the intern, one for the program) that described the lesson while also noting questions to ask in the later debriefing session. For example, Hee-Sun divided her observation report into three columns: Teacher, Student, and Thoughts/Questions. In the teacher column she described what she saw the teacher doing or saying (ex. "9:35: <Whole Group> 'The conclusion is due tomorrow. What do we notice? What are some patterns?). In the student column, she would describe students' work, behavior, and talk (Next to what Hee-Sun wrote above she wrote: "Being quiet. 'Hot went faster.' 'Cold took longer.'") Finally, she would record her own impression and questions she had for the intern ("How can we have students present their results to the whole class and help them find the patterns?"). Sam used the same triplicate papers, though his reports were more narrative. Instead of three columns, he would summarize a segment of class in paragraph form and then off to the right, would pose a question (e.g., "What role does this kind of review play in student learning?") These written reports were often two to three pages long and composed entirely in the duration of the lesson being observed; interns were handed their copy during the post-observation conference.

On occasion, particularly when students were working in groups on an assignment or in lab situations, field instructors would leave their seats and circulate. Most often,

they would simply observe the students or pose to them descriptive questions that might help them understand what the students were doing (e.g., "Do you mind if I watch your group for awhile?" or "So what are you working on?"). I did observe Hee-Sun and Sam each engage in behavior similar to "smoothing things out" on one occasion, both in laboratory settings. Hee-Sun noticed a group of boys in Chad's class begin to playfully argue over the last lab stool. Before the situation escalated and before Chad noticed it occurring, she stood up and offered the boys her lab stool. The boys laughed, took the stool and started working. During one of Kimberly's lab, Sam noticed a group getting off task. He walked over and said "So are you done? What did you discover if you don't mind me asking?" He talked with the group for two minutes or so about their results until Kimberly called for the class's attention and gave directions for cleaning up. These two relatively small interventions were the only times I saw field instructors providing help with real-time, smoothing out assistance; neither intern was likely aware of the intervention. Any other assistance or feedback came after the lesson during the post-observation conference.

Depending on the intern, post-observation conferences were held in different places throughout the school. Tammy had a backroom where she and Hee-Sun would meet as Vince taught while Chad and Hee-Sun often met in the school library, again, without Frank. Hee-Sun and Heather sometimes met in the lunchroom across the hall and other times met in the classroom—when in the classroom, Ken would usually join them. Cindy and Hee-Sun met in Cindy's classroom and Shannon joined them only occasionally. Sam and his interns, Holly and Kimberly, always met in the classroom after

school or during a planning hour and, at least when I observed, always were joined by Michael or Bonnie, respectively.

I describe later the content of these conferences. Here, I focus on the physical nature of the conferences. First, interns and field instructors (and mentors, when present) would sit around a table to talk. In many ways, this table could have been anywhere without impacting the meeting; the physical surroundings of the room rarely if ever played a part in the conversation. I never observed interns or field instructors leave their seats to demonstrate or re-enact a moment from the classroom nor did the physical layout of the room become the topic of conversation. Instead, interns and field instructors talked about the lesson that had just occurred, with the observation notes of the intern serving as a guide for the conversation. For example, in the conversation below, Sam talks with Kimberly and Bonnie about a lesson he had just observed where students were working in groups on a review activity:

Sam:	(looking at his notes) I thought it went pretty well and really most kids were pretty engaged. But I noticed that in several of the groups , it seemed like one of the students might have dominated the group a little bit, just let the other group members sit back and then in one of the groups, they didn't seem to make much progress. So, I wrote this question here (pointing to his report) "How do you make sure that students are all working productively?"
Bonnie:	Well, for the groups that were working . . . . (response not recorded)
Sam:	I also noted (pointing to report) that some of the kids relied pretty heavily on their notes.
Kimberly:	And some kids do do that so I try to make every problem a little different from the ones in their notes do that they have to understand their notes rather than just copying the example problems.

Conferences did not always stay as tightly connected to the reports as in the example above; field instructors often gave interns a chance to comment about what they saw as important events and these were not tied to the text that field instructors had

produced. But those questions that field instructors noted in their written observation were always brought to the interns' attention.

Four times throughout the year, interns, cooperating teachers, and field instructors met in classrooms for more formal evaluation meetings (fall midterm and final conference, spring midterm and final conference). These meetings were not connected to any particular lesson, but were instead an opportunity for more structured evaluation from both the field instructor and cooperating teacher, organized around the program's standards. In fact, these meetings and the forms that went with them were in most cases the only time that cooperating teachers provided written feedback to the interns.[1]

The conference forms had four sections, each of which was written on a page. These sections were: 1) Liberal Education and Science Subject Matter, 2) Working with Students, 3) Class Organization, and 4) Professional Roles and Responsibilities. Cooperating teachers, field instructors, and the interns completed the forms independently, giving the intern a score, ranging from novice to expert on each section, along with notes about the strengths and areas for improvement. The meetings always began with a sharing of forms, giving each participant about five minutes to read the others' reports. Once that had been completed, the field instructor would ask the cooperating teacher to comment on the first page, follow that with his or her comments, and then give the intern a chance to respond. The text served as the center of this important formal meeting. For example, during Heather's spring mid-term conference, Ken and Hee-Sun discussed Heather's progress. When Hee-Sun asked Ken about what

[1] The only exception to this was a TE course assignment that required interns to get written documentation of a lesson from their mentor. Four interns received that written summary from their cooperating teacher. Furthermore, it was intended to be more like 'data' that interns used to make claims about how instruction went rather than feedback.

things he'd like to see Heather work on for before the internship ended, he asked "Do you mean on particular sections or overall?" Hee-Sun told him that "by section would be good." Ken, over the course of the next three minutes, summarized his feedback by following the text he had written on the evaluation sheet:

> Well, I think really nothing in section 1. We have a pretty set curriculum so there aren't a lot of places where she can make many changes. . . . I just don't have any concern with one, two, or three. Number four, assessments, are very good. One thing with inquiry I would like us to look at more are data. . . . Caring for individual students (a subheading on the form) – we've talked about this some – but you know when you are annoyed with students, making sure that they don't know that you find them annoying. . . . Responding to behavior (subheading), you are really very good at confronting misbehavior. Technology (subheading) is outstanding – one thing you do is that you change plans very quickly if you need something and that is very hard for an intern to do. I think that 10 and 11 (sections on the form) are awesome. . . . I'm asking you to do things that aren't any of my strengths. I really want you to be accomplished. I mean, expert, who can be expert? I don't like that language, master teacher. I don't even know what that means.

Hee-Sun's response was, likewise, tightly tied to the text that she had prepared. Like Ken, she began at section 1 and progressed through the sections using the language on the form. She began: "I also think that you are strong in the first strand, but I want to see you focus more on science content and the way that science works." She continued by describing Heather's progress from her perspective on each section.

This was the format for all the formal conferences and was followed without exception across interns and field instructors. The most extreme version of this occurred in Holly's spring mid-term conference where Sam tried to convince Holly that she needed to make changes in her practice or his final evaluation of her would be negative:

> Sam: So I'd like you now to read this as a school administrator, through that lens and see if there are things that would raise a red flag in terms of them making a hiring decision.
>
> Holly: Yeah, sure. I think, well like with "shying away" – what were the struggles that she was having?

Sam: Would you hire someone based on that first paragraph?
Holly: Umm, it depends. If I'm looking for Chicago Public Schools and it is all about managing student behavior, that would be a problem.
Sam: I recognize that you are still an intern. I know that you still have some room for growth. But I almost wanted to get a reaction out of you with this (pointing to the written evaluation), but you stayed with Miss Congeniality.
Holly: Well, I have known that student behavior would be my big goal, my big challenge. I mean, I remember saying in my first journal that my life would never be the same.
Sam: Well, as you go through this evaluation with a fine-toothed comb – are there things that you would like to have changed? And what would the reasons be? I'm not trying to be mean here, but I want you to make those changes in writing (Sam hands her a red pen) so that we can have something different in your final evaluation. What about that first sentence?
Holly: Adequate? (reading from the text) Is that what you want me to notice?
Sam: Well, I think that you know your physics, but I want you to be able to translate that to students.

The conversation was tense and uncomfortable. Sam took Holly line-by-line through each sentence of the evaluation and asked her to interpret what was undesirable about the words he had written and make corrections (in red ink) that reflected what she would like in her final evaluation.

Written Later: Journals and Course Assignments

I have already described the ways in which journals and course assignments emphasized the need for interns to reflect on their work. Later, I will look at the structure of the assignments and the ways in which field instructors and course instructors used interns' experiences to reinforce and teach core ideas form State's program. Here, however, I will briefly describe the embodied, or perhaps disembodied, nature of these written assignments and the feedback.

First, and obviously, these assignments and the feedback were text-based. When interns describe in a journal or course assignment how a situation transpired in their

classroom, many of the physical details of the classroom, of the student, of the interns' voice and body are lost. Even though assignments push interns to "describe situations" before interpreting, very rarely does this description include descriptions of classroom surroundings, of students' physical appearance, posture, or voice tone, or the interns' physical or bodily response. Even in the rare cases where more physical descriptions do come up (for example, Tammy describes a student whose response to her request to work is "a blank stare and then he returns to reading his novel"), course instructors and field instructors do not specifically address those physical characteristics. (In the case above, for example, Sandy, Tammy's course instructor, does not comment on the blank stare.) This is reasonable, of course. Course instructors do not attend the interns' classrooms, do not know interns' students, and would have to depend on the interns' abilities to write very descriptive prose that allowed them "see" into the classroom. This rarely happens. These text-based formats for communication and feedback do not lend themselves well to paying attention to more physical or bodily aspects of teaching.

Second, when interns write these assignments, they do so away from the classroom in which the events they described occur. Interns, for example, are not writing journals as they teach as a running log of their experience. Instead, after the event has occurred, hours or days later, they reconstruct the events as they type on their computer. Interns completed this work in different places; Chad did much of his work for TE in a prep room connected to his classroom or at home as did Kimberly and Lindsay, while Heather completed hers at a computer in the classroom as Ken taught. As interns completed this work, they were sitting and typing, most often alone. And while I never observed the field instructors and course instructors typing their feedback, one can be

sure that it did not occur in the interns' classroom and it often occurred many days, if not weeks or months, after the event had actually transpired in the interns' classroom.

Discussion

Looking across these three main sites for interaction between TE and interns (university classrooms, field instructor conferences, and electronically exchanged assignments and journals), three themes emerge. First, written text plays a prominent role in interns' work with teacher educators. In courses, interns read texts, produce texts, center discussions around texts, and receive feedback, advice, and encouragement through written texts. When field instructors come to observe teachers in classrooms, they are expected by the program to produce a text and use the majority of their time in the classroom doing so. During the post-observation conference, that text loosely guides the direction the discussion takes and the text serves as permanent feedback the intern receives and can go back and consult. Interns are judged in courses on their ability to create written texts. While the assignments asked interns to connect their lived experiences with what they were writing, the act of writing for TE was not one done in the moment of teaching. Instead, interns wrote by themselves, after the teaching had ended, about events that had occurred previously. An intern who wrote well about his or her experience, who followed the assignment's guidelines, and could put into written form the kinds of thinking that teacher educators desired met the assignment's requirements regardless of what occurred in the classroom. Likewise, a teacher who taught well, but failed to write well about that experience, might be evaluated poorly. I am not claiming this occurred, but simply suggesting that course instructors' primary basis for evaluating teaching came through judging the written texts interns produced.

Second, in every TE-related setting, interns mainly sat. In class, they sat while instructors stood and walked. In conferences immediately following a teaching observation, interns and field instructors sat. When interns wrote assignments or journals, they sat. This stands in sharp contrast to the work they do in classroom with their cooperating teachers. Of course, they sometimes sat as they met with a parent in a conference or enter grades at their computer. But their work also involves them doing many other kinds of activities with their bodies as I described in the previous chapter—collecting water samples, running across hallways to retrieve their mentor, pulling brains off shelves, and leading discussion while standing in the front of the classroom.

Third, when interns interact with teacher educators, they do so in ways that resemble students rather than as instructors. In TE classes, course instructors determine where interns sit and when interns will talk or write or listen or move but in schools, interns make those decisions. In schools, interns dress professionally and in the TE classrooms, their instructors do. In TE classes, the teacher educators tap their shoulders, reminding them to put their cell phones away; in schools, they do the tapping. Even with their field instructors (who are often in the interns' classrooms), interns take on student roles. The evaluation forms are provided by the field instructor (through the program) and the intern is evaluated. In schools, interns do the evaluating; they write the tests.

The physical dimensions of the life of an intern in schools and TE stand in sharp contrast with one another. As we shall see, the more cognitive or conceptual tasks of interns' lives are also very different.

"Can you give me some analytical way of seeing this?": Oriented Toward Ideas

State's TE program was clearly grounded in interns' work in the field. Almost all course assignments involved, for example, interns making changes to their teaching, reflecting on lessons, or designing and analyzing interventions. The stereotypical accusation that positions TE as an ivory tower institution unaffected by the problems of the field does not hold for State's program. However, the ways in which State's program, both through its course instructors and field instructors, used interns' experiences and taught interns' to use their own experiences varied greatly from the work that interns did with their cooperating teachers. While in schools, interns and cooperating teachers approached interns' experiences as problems to be solved with few attempts to generalize to principles of practice; in TE, interns were consistently pressed to consider their experiences in light of ideas about teaching.

Course and field instructors asked interns to inductively look across their experiences or the experiences of classmates to find patterns and connect those patterns to ideas promoted by the program. In more deductive cases, ideas about teaching were presented and interns worked to find experiences from their practice that could serve as examples of that concept or principle. I consider each.

Learning to Teach Through Inductive Analysis

TE course instructors often attempted to have interns arrive inductively at certain principles or ideas about good teaching. They most often did this by proposing a topic for discussion, either in whole group or small group, allowing interns to describe for each other examples from their own experiences related to that topic, and then attempting to bring interns to a conclusion that seemed supported by the "data" of the experiences that

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had been described. For example, in a professional responsibilities class in November, Will divided the class up into small groups to discuss the topic of homework. He provided them with 4 prompts: 1) The purpose of homework is _____, 2) Different ways to assess homework are _____, 3) My stance on homework is _____, and 4) I still wonder _____. The groups of four interns went to work, following the prompts but also talking about their own teaching experiences with homework, both good and bad as they perceived it. In the group I observed, a social studies intern shared one of her more successful assignments in which she had students collect newspaper articles about the recent election, while a math intern described an assignment in which his students collected data from friends and family that were later used as part of a class activity. As the math intern shared his story, he said "I think it is a way of connecting outside of school to school." "Oooh, I like that," said another intern, as she wrote down his example and his summary sentence. When Will called the groups back together, ideas were shared and discussed. The group I observed shared their finding about how "we've found that when we can connect students' lives to the assignments, that they are much more successful." After each group had shared, Will wrapped things up by stating the principle about HW that he believed came out of the interns' discussion:

> I'm pleased about how this went and the thoughtfulness that you all displayed, as well as the great ideas that came out of this. I think we can see now that homework has to have a purpose and that we have to be thoughtful about how we use it, not just giving lots of assignments for the sake of work. Student learning has to be the focus of what we do.

In another example, Cathleen was summarizing interns' responses to a course assignment, in which some interns were expressing disappointment that interventions they had tried had failed to achieve the desired outcomes. She described interns'

experiences, using a few personal examples ("for example, James wrote about the ways in which his attempt at implementing a contract didn't seem to matter because the parent never bought in"). After several examples had been shared and interns could see the pattern emerging, she introduced a principle that she hoped they would remember; "the idea I want you to hold in your hearts and minds is persistence. I want to see you not giving up on kids. Don't give up. How can you keep at it? That what I take from these and what I hope you take from them." In examples like this, course instructors allow ideas to emerge from interns' descriptions of their work and then connect these to a principle that they view as important for students to know: don't give up, make homework meaningful.

Another version of this kind of inductive work in TE courses is course instructors' ability to "name" interns' experiences. Here, course instructors listen to interns describe their experiences, often in the context of general questions like "Is there anything anyone wants to share about their week" or "Are there any pressing issues that someone would like to bring to the table?," and then place the interns' experience into a particular category, often one that has some theoretical backing. Sandy, for example, was a big proponent for the classroom management strategies promoted in *Love and Logic*, one of which is the principle "provide choices within limits" (Fay & Funk, 1995, p. 28). She began class one week singling out two interns to share their responses to a prompt about something that went well the previous week. Jason talked about a success he had in his relationship with a troubled student. Elizabeth described how she and her mentor had let students choose among different math assignments and the resulting increase in motivation she had perceived in her students. Sandy noted:

> I thought these were really good examples of what *Love and Logic*, calls "giving kids choices." In Elizabeth's example, I liked how the choices could even be in the curriculum—I learned something from that. I hadn't been thinking of "giving kids choices" in that way. These are just really good examples.

In other cases, course instructors labeled interns' stories as being examples of "the uncertainty that comes with teaching," "the kind of things students do when they don't understand," or "the classic dilemma of depth versus breadth." In each, interns shared experiences in response to more general prompts; course instructors then named the experiences as examples of some concept. The instructors turned an intern's work into a case of some class in an attempt, one presumes, to help the interns understand their own situation better and to help teach principles the instructor believes will serve the intern well in future practice.

This effort to move from examples to principles may also be a result of discomfort at lingering too long on any one individual intern's story. TE course instructors, unlike cooperating teachers and field instructors, have responsibility for guiding *groups* of interns all of whom have unique contexts and experiences. In focusing on one teacher's story, on problem-solving for one intern, other interns may be left behind or bored. A particularly telling example of this concern happened shortly after the *Love and Logic* discussion I described above. Two classroom teachers (an English teacher and a guidance counselor) arrived as guest speakers to talk about their experiences with *Love and Logic*. They were introduced by Sandy as experts in its use. These teachers, both of whom were experienced cooperating teachers, presented the principles they found most useful (like giving students choices), and, for each principle, they described many classroom examples. However, when Tammy described a new situation which had been really troubling her, the differences between the ways in which

these experienced cooperating teachers and Sandy, the course instructor, responded were quite different:

> Tammy: I have a new student in my class – they just moved him in from another section, because of disciplinary problems in another class. And I'm having a hard time putting what he did in that class out of my mind. So I feel like I'm kind of watching him at every moment and I feel like I maybe need to give him a break. So I'm having a hard time building a relationship with him. Because what he did was really not a good thing – I mean he hurt someone else. So I think I'm a little intimidated, well maybe not intimidated, but worried, with him in there. He's a big guy . . .
> English Teacher: I'm just curious, Tammy, was the student that he hurt, a girl?
> Tammy: Yeah.
> English Teacher: Yeah, that's tough. Wow.
> Counselor: Is your mentor in there with you all the time?
> Tammy: Well, this is my focus class so he is sometimes, but sometimes he steps out.
> Counselor: I think this would be a situation where you would want to have him in there with you. You might want him around whenever that student is in class. It sounds like in some ways that you don't feel safe, and that isn't right.
> English Teacher: And I wouldn't feel safe either – there's no reason that you have to feel this way. When he got moved, was there some kind of contract set up about his behavior?
> Tammy: Actually, there was, and we are trying to figure out what to do with this, because he keeps showing up tardy and that doesn't seem right . . . .

This conversation continued for the next two minutes, with the two teachers probing Tammy, asking questions about the situation, seeking more information, and providing concrete potential steps. Finally, Sandy, the course instructor, seemed to grow a little uncomfortable with the path the conversation was taking and broke in, "You know, Tammy, let's talk about this a little more at the break. My experience is that you can't teach if you don't feel safe. Let's take a ten minute break."

In the classroom teachers' hands, Tammy's problem was not treated as a case of a larger concept. It was a specific situation in need of a solution that they went about

solving. The TE course instructor's uncomfortable reaction to the discussion suggests the atypical nature of this kind of talk in a university classroom. And her statement "My experience is that you can't teach if you don't feel safe" is a perfect example of an attempt to take Tammy's situation and apply it more generally, to make it a case of a more general situation.

Field instructors also commonly used a more inductive approach to connecting interns' experiences to the principles and ideas promoted in teacher education. As did course instructors, field instructors used interns' experiences as a connection point to more general principles. For example, following an observation in which Hee-Sun had observed Heather use a "demo log"—an instructional tool that Heather and Ken had invented in which students watched a chemical demonstration and then systematically recorded data and conclusions from the demonstration. In the log, there were spaces for students to write, labeled with the headings Before, During, and After. To Hee-Sun, this format seemed parallel to a Predict-Observe-Explain (POE) instructional model frequently used in science education (Palmer, 1995) and discussed in State's science methods courses:

Hee-Sun: I noticed the demo logs. Are these kind of like a POE?
Heather: Well, sort of, but we have before, during, and after.
Hee-Sun: Why not just use POE?
Heather: I just thought that it might make sense for students to call it during, after, and before—these are terms they know and they make sense with the demos. It just seems a little more student-friendly . . . Seems like POE would require me to explain a lot.
Hee-Sun: I'm asking because we think the goal of science teaching is not just teaching scientific canonical knowledge but also the way that scientists view the world and the language of science, the logic of scientific thinking. I think that's part of the goal of science teaching. So what did you expect that kids get in class today – is it just the knowledge in the textbook? Or more? Would we want them to know about predicting, observing, and explaining. What do you think?

Hee-Sun noticed a connection between the experience Heather had just had and an idea from Heather's coursework. Though Heather had not made that connection before, Hee-Sun attempted to use that experience to promote an instructional strategy discussed in TE, as well as remind Heather of the multiple goals of science education, a point regularly made in Heather's science education courses.

In another case, Hee-Sun had just finished watching Tammy teach a lesson on pedigrees:

Hee-Sun: So was this an application or inquiry lesson? Can you give me some analytical way of seeing this?
Tammy: It is definitely an application. They already knew about pedigrees and then we were having them use them to answer questions.
Hee-Sun: Application means that we are going the other way from experience to patterns to models. So what are those in this lesson?
Tammy: Well, the model would be the beginning like with the pedigrees. And the actual experience would be the stories, making the transitions from what's on the paper to the structure of the pedigree.
Hee-Sun: Patterns?
Tammy: Well, pedigrees are always structured the same. I'm trying to give the students lots of experiences with the pedigrees.
Tammy: That's good. I like it.

Hee-Sun attempted to foster here in Tammy the ability to take experiences that she has just had as a teacher and apply a theoretical lens (provided by TE) to that experience. Tammy's lesson becomes more than a lesson about pedigrees; it serves as an example of an application lesson that Tammy might use (Hee-Sun might hope) to better understand and perhaps use application lessons in general.

Field instructors also used interns' journals to reinforce this kind of thinking. After Heather had described a lesson she had completed (along with what she might change or improve), Hee-Sun replied:

What you did in these lessons—a) having students know the value of learning

> about a particular unit or topic, b) pre-assessing students' prior knowledge or understanding and using those information as a resource, c) motivating students by having them see the connection and usefulness of the content with their lives, are all excellent strategies for leveraging your students' understanding. I hope you are finding some converging points between State's words and your classroom instruction. The more you know about your students as learners, the more you will be successful in assisting them build on their own knowledge.

While Heather had described the lesson and her instruction, she had not referred to her practice more generally, at least not using "State's words." Heather described a very specific example in which she used a mistake on a wireless telephone bill to teach the importance of including units in any mathematical calculation; Hee-Sun made this a case of "motivating students by having them see the connection and usefulness of the content." Hee-Sun's hope that Heather can see the connection between "State's words" and her instruction illustrates well this important attempt of TE to inductively connect experiences to ideas.

Learning to Teach through Deduction

In addition to using interns' experiences to generate principles through inductive means, teacher educators asked interns to recall their experiences in order to teach and explain particular concepts. In the more inductive approach, interns recall or are prompted to recall experiences and teacher educators guide the experience toward principles of good teaching promoted by the TE program. In the deductive case, however, interns' experiences are generated in order to serve as examples of a concept.

The most common example of this deductive work centered around assigned course texts. For example, in Cathleen's class, interns were discussing a chapter from a classroom management text (Weinstein, 2007) in which the author outlined principles to be considered when designing classroom space, including security and shelter, social

contact, and task instrumentality. Each group of students was assigned a topic and asked to discuss the readings, relate them to their internship experiences, and prepare a class presentation. One group was assigned "task instrumentality," that is, the "ways in which the environment helps us carry out the tasks we need to accomplish" (Weinstein, 2007, p. 44).

The interns spent a short amount of time rereading and discussing the half page description of the topic before beginning to list the ways in which their (really, their mentors') rooms were or were not prepared according to the principle. One intern offered as "a good example of this idea," her struggle with her mentor over room arrangement. Her mentor preferred "more traditional" styles of teaching, in her view, which meant he wanted the room set up in "nice neat rows." When she wanted to try something where she had students working in groups, she either had to rearrange the table and risk his disapproval or have students working as groups at tables that were too far apart. Another intern commented that this "seemed like a good example for us to use" in their presentation.

Likewise, Sandy had interns generate a list of important principles from *Love & Logic*, select one, and then generate an artifact—a clay model, a poem, a drawing, etc.—that connected the principle to their classroom experiences. Will lectured about different conceptions of justice (retributive, procedural, or distributive) taken from a course handout he had prepared, before having interns think of scenarios in which these visions of justice were on display in their school sites. In cases like these, the interns were asked to sift through their experience and identify relevant examples. In so doing, they demonstrate their understanding of a concept.

Discussion

This emphasis or orientation on ideas was not a haphazard result; instead, teacher educators explicitly provided rationales to interns for focusing on ideas and talked about them in interviews. Sandy often emphasized to students the need to keep "core values present as you teach" in order to make good principled decisions. She described the use of Love and Logic to interns as being more than a set of strategies:

> Let me tell you one thing. I know that you want strategies to do on Monday morning to deal with this particular kid. But *Love and Logic* is about developing something bigger, a philosophy, and a stance that guides me – the thing that I keep in the back of my mind to draw upon in any situation. It's about developing a philosophy and a stance.

Likewise, Cathleen emphasized the need to have a "guiding philosophy," conceptualized as a set of principles that guide your decision-making process. Will saw the course as an attempt to bring interns' experiences into dialogue with "some ways of thinking about classroom management and professional responsibilities." In the science-specific TE course, Rosa emphasized a few key concepts—inquiry (including POE), learning cycles, and Experience-Pattern-Explanation (EPE) tables—that she hoped would serve as "a basis for a strong professional practice." Everywhere, the emphasis was on principles, values, guiding ideas, frameworks, or key concepts that would serve interns in their practice regardless of context. This push to see experience through an analytic lens stands in sharp contrast with interns' work with cooperating teachers in which the emphasis was on the joint work of solving a concrete problem.

Field instructors echoed the course instructors and saw themselves under an obligation to help interns understand and enact the principles of State's TE program. Hee-Sun admitted that she viewed as one of her main roles "to serve as an advocate for State

ideas here in the classroom," even though she knew that "this was sometimes resisted by interns and mentors." Likewise, Sam recognized that the program had some "big ideas" that it promoted and that part of his job was helping interns put those into practice, though he emphasized how challenging he found this to be.

Conclusion

As I did in Chapter 4, I will return to my ecological framework to assist in summarizing. As seen in Figure 5.1, the primary interactions of interest for this chapter are those between the field instructors, TE courses, and the intern.

When interns interact with their TE courses, reasoning and ideas were the agents through which socialization was intended to occur. Course instructors held as central to their work the development of interns' abilities to think and reason about teaching; whether in discussions or through written assignments, interns were asked to practice reasoning about their practice. In the assignments, the steps of processes (e.g., working through a case) acted as scaffolds for interns' thinking, an attempt to discipline their minds to consider alternatives carefully, use data in making decisions, and be able to support instructional choices. In addition to reasoning, course instructors also attempted to convey to interns the importance of ideas, theories, or principles that might speak across contexts. Using course readings or through more inductive means, course instructors connected interns' experiences as teachers to more theoretical ideas which they hoped would serve interns even in future placements throughout their career.

As interns interacted with field instructors, "reflection" was still emphasized though the meaning shifted toward one of introspection. Instead of interns being supported in systematic or rational thinking, the emphasis moved to searching one's

experiences closely, even emotionally, and using those experience of looking backwards to make changes in future practice. Ideas were also central to the interaction between field instructors and interns in part because field instructors felt an obligation to promote key concepts from State's program. When field instructors would observe interns teach, they often asked interns to use teacher education course frameworks (e.g., POE, inquiry or application) to analyze their teaching. Likewise, in journals, they would supply "State's words" to the experiences that interns had in an effort to help interns see how their experiences might be learned from.

By carving up the ecology the way I have over the last two chapters, I ran the risk of perpetuating the "ivory tower" stereotype in which academic interests (in this case, teacher education) have little interest or connection to the real world (in this case, the schools). I wish to emphasize here how the stories in this chapter dispel that characterization as it applies to State's program. No doubt, cooperating teachers rest closer to those school and classroom contexts; they spend every day there and the interactions they have with interns occur in those schools and classroom if from nothing else a result of geography. However, this chapter also describes the interaction between teacher educators, interns, and the school/classroom context. Field instructors' work consisted almost entirely of interacting with the intern in the school/classroom context: providing feedback on lessons in that context, responding to journal entries written about it, and writing evaluations that reflected interns' progress in it. Likewise, course instructors designed assignments and activities that required interns to bring their experience in that school/classroom context to bear. No course instructor, for example, ever gave an assignment that two interns could have completed in exactly the same way

like, for example, a review of literature; because interns taught in different contexts, course instructors expected they would use their experiences in unique ways. The work teacher educators did with interns centered around interns' work in schools. However, as we turn to the discussion in the next chapter, what becomes clear is that while teacher educators and cooperating teachers may both make connections with the teachers' experiences in school and classroom contexts, the work they engage in with interns is so different that, for some interns, they seem to be working in different worlds.

Chapter 6
Worlds Apart

As the internship approached an end, interns began to shift their focus from the work of teaching to finding a job, and the TE courses (particularly TE Professional) devoted class time on Fridays to assisting interns in that endeavor. As interns developed their resumes, portfolios, websites, and professional statements, course instructors designed activities that allowed interns to get feedback on these documents from the instructors, classmates, and members of the professional community like local principals and teachers. During one activity, interns were dissecting Cindy's personal statement. Peter (a social studies intern) questioned the way Cindy had phrased something:

> *In the second paragraph, you say, "Making the class inquiry-based rather than a collection of facts." That makes it seem like all you are doing everyday is inquiry. That's not true, is it? I wonder if what you mean is that while science for a long time has been just memorizing facts, it is more than that —that you are also incorporating other strategies like inquiry to give a fuller picture of the discipline —things like that. You know, you want to include some of the State taglines, toss them in.*

Cindy responded to this last statement with a quizzical look. Heather, however, knew just what he meant:

> *Heather:* *That's what it seems like we are doing in here is taking taglines and adding them in so that people know that we know what we are talking about. Diverse learners, inclusion, inquiry, model-based reasoning, Love & Logic – you know what I am talking about, right?*
> *Cindy:* *Yeah, the thing is, I want to mention them and I can use the words but then I can't think of something that is an example of it. How would I actually use it in my classroom?*
> *Heather:* *Cindy, it's just teacher education talk. You need those kinds of things in there.*

Heather's description—"it's just teacher education talk"—of interns' use of "State taglines" neatly summarizes her approach to teacher education coursework. As presented in previous chapters, the worlds of TE and the school had characteristic ways of working.

Heather, more than any other intern in the study, explicitly identified those differences and developed techniques to keep them worlds apart. That she was able to do so while experiencing great success in both worlds raises questions about the roles that teacher education coursework and field experiences should and do play. In this discussion, I highlight Heather's techniques for keeping the worlds distinct and then use those techniques to contrast the TE and school-based experiences for the interns. I will conclude by using Grossman, Hammerness, and McDonald's (2009) distinction between "pedagogies of enactment" and "pedagogies of reflection and inquiry" to understand the disproportionate influence of cooperating teachers on interns' practice and beliefs.

"Based on a true story, I guess": The Story of Heather

Heather had, by everyone's account, an extremely successful internship. From the beginning, her mentor, Ken, raved about how well she was doing, how far ahead she was of any intern he had worked with previously, and how masterful she was in front of students. When the time came for her first formal evaluation at the midterm of the first semester, Ken was prepared to give Heather scores of "3" (accomplished) with, perhaps, a few "4's" (expert teacher) on the evaluation categories. He argued that "in a lot of ways she is better than a lot of teachers I know with many years of teaching experience. If someone walked into her room while she was teaching, I don't think they would think she was an intern or call her a novice or beginner." Hee-Sun, however, convinced him to lower his marks to "1" (novice) or "2" (beginning teacher) in order to be able to note growth over the year. She admitted, however, that "when I was filling out the monthly evaluations for Heather, I had checked some as 'accomplished' too, but then I had to change them because I worried about being able to show growth." Clearly, Heather's

cooperating teacher and field instructor were impressed from very early on with Heather's ability to perform in the classroom. At the end of the year, both continued to describe her in glowing terms.

In her teacher education courses, Heather was also a top performer, viewed as conscientious and dedicated by course instructors. Her grades were excellent, but more than that, she seemed like the kind of intern who (as her TE Science instructor said) "gets it. And even when she doesn't get it, she gets that she doesn't get it." On the assignments I had access to, I never saw feedback from course instructors that was less than very positive, and she reported receiving 4.0s across both classes in both semesters. Her TE Professional course instructor did have some concerns, however, but they were not about the quality of her work on which "she always did exactly what was asked as well as she possibly could" —even requesting and completing re-writes if the grade was not what Heather desired. Despite success on assignments, Cathleen suspected that Heather never "really connected" with the class or with her—an intuition that "troubled" Cathleen because she suspected that Heather had great potential as a teacher. "I just don't think she ever got beyond being a student in TE Professional. She just did what she needed to, to get her A and be done."

This troubling lack of connection did not, however, trouble Heather; the separation between her TE and teaching responsibilities was the result of strategies she actively employed. For example, while the journals represented an important connection point between State field instructors and the interns, for Heather they were:

> a waste of time. I mean, honestly, I usually do them for the week on Monday. But you have to write them for two days a week, so I usually write it on Monday for Monday and Tuesday . . . I haven't even taught on Tuesday yet and I am making up something that we did. And usually it's all based on real stuff. But not

> necessarily. Based on a true story, I guess. It might be based on something that happened last week, but I kind of know what needs to be put in those. (Interviewer: What do you mean?) I know what she is trying to see out of it, like how we're developing some problem that we had and how we think about that. And a lot of times I think about an issue that I have with the practice of teaching and I'll pretend that something happened that day that has happened before and I write about it. I think that I am still benefitting in that I'm thinking about the problems of practice, things like that. . . . They are really good fabricated journals.

In Heather's admission that she often used her imagination to write her journals, we see how separate Heather sees the practices of TE and teaching. In TE, from Heather's perspective, they want her "to think about problems of practice"—whether those problems of practice are exactly problems of her practice is a secondary consideration. It is the thinking that matters. In many ways, Heather's experience proved her right. Hee-Sun often complimented the thinking that she displayed ("It seems to me that you are becoming seriously aware of the difference between you as a successful science learner and your students who mostly have not had successful experiences in science") or used the journal to evaluate Heather ("I am really enjoying reading your journals and seeing your progress!"). Hee-Sun viewed Heather as "very reflective," based, in part, on her assessment that "when you read her journals, you can tell that she is considering the ideas from State in her teaching."

The story holds for course assignments as well, which always required students to connect their field experiences to the ideas in class. On occasion, Heather would, just as with journals, invent experience to better fit the assignment. On her inquiry report (a major assignment on which she received the highest grade and positive feedback), she recalled how a change in her mentor's plans meant that she would be unable to teach the lesson as she had planned for the assignment. Rather than re-write the plan, she simply "wrote about the half that they (her students) did do and made the rest of it up." Her

analysis of how the inquiry lesson went (a successful analysis in terms of her grade and feedback) was based in part on data she imagined. Likewise, in TE Professional, the most important assignment required interns to select a "case"—a student or students with whom the intern was not experiencing success—and work systematically through an intervention and analysis of that intervention. Heather worked hard at her school placement; she had initiated several interventions with students in her class outside the scope of this assignment. Rather than begin a new case for the assignment (as was the course expectation), Heather simply wrote about one of the interventions that she was in the process of working on. She did not "make up" data, but she would write about things as though she were following the steps of the assignment, portraying it more systematically than it really was. For example, she wrote about possible interpretations of her student's behavior, the interpretation she found most compelling, and then described the intervention design based on that interpretation. In reality, the intervention had been in progress for many weeks before the assignment began and the multiple interpretations and rationale for interpretation occurred after the intervention had already been selected. Recall the feedback from Cathleen:

> You begin with a balanced description of worthwhile problems, then analyze each of these problems with care and insight. Next, you turn to stakes and alternatives, carefully mapping out your thinking for the reader about what's going on, why it matters and what you might reasonably do to address it. You then reflect on your implementation, which highlights the ways your teaching is becoming more responsive to individual student needs.

It could hardly have been more positive. Heather clearly understood what the assignment was asking her to do.

It might be easy to view this as a simple case of academic dishonesty, as a situation in which a student thwarted instructors' attempts to create authentic assignments

to reduce her workload. I do not have any evidence that suggests other interns engaged the assignments in quite this way, so I would not claim that this kind of work is prevalent or common in State's program. However, one must not forget that Heather was successful in her high school classroom, in many ways the most successful intern in this study. She was not a lazy teacher; just the opposite. She was always prepared, organized, creative, and conscientious. She did, however, have a very real sense that what was required of her in TE was of such a different ilk than what was required of her in her teaching, that they were best handled as different entities.

The Differences between TE and School-Based Practices

When one looks at the practices that interns engage in and the support that they receive in these two different sites, Heather's conclusions, if not her strategies for coping, seem reasonable. When interns worked with their school-based mentors in their school placement (detailed in Chapter 4), they did so in different ways and on different tasks than with their TE-based field instructors and course instructors (Chapter 5). I summarize these interrelated contrasts below.

The Task Orientation of the Field vs. the Idea Orientation of TE

When we look at what interns are spending their time focused upon in these two sites, there is a distinction between tasks and ideas. When interns were in school and taking the role of teachers, their days were filled with getting things done—writing unit calendars, making copies of worksheets, designing PowerPoint slides, grading papers, tutoring students, and teaching lessons. In that flurry of activity, mentors' helped the interns get these things done. Mentors and interns did not talk *about* writing unit

calendars; they wrote unit calendars together. They did not talk *about* handling angry parents; they approached that parent as a pair.

TE, particularly the courses, took a different stance. Teaching, from TE's perspective, must be more than a set of tasks to accomplish —one must make principled decisions, analyze the results of those decisions against those principles, and reflect on the process. When teacher educators in State's program assisted interns, it was on these reflective and analytical tasks. In class, interns were supported in connecting their experiences to theoretical ideas and taught how to collect and analyze data. Field instructors structured experiences in post-observation conferences and journals in which interns engaged in reflection on their work.

On occasion (as described in Chapter 4), mentors did work in more "meta" conversations about the work they were accomplishing; they might state a general rule for working with students ("you have to let kids know the consequences of their action or you will appear arbitrary to them") or, more rarely, appeal to a principle that interns might remember (e.g., keeping things visual when presenting). But even these relatively rare occurrences had a different tenor to them from the meta-conversations encouraged in TE. They never appealed (as did teacher educators) to ideas or principles developed from research or from literature on teaching. I have no examples where cooperating teachers or interns made connections from their experience to the kind of concepts found in educational journals; in other words, never did I see a mentor or intern say "This experience we just had was an example of concept X" or "So if we apply principle Y, what kind of approach might we take?"

Likewise, the work that interns did with teacher educators rarely, if ever, involved accomplishing a task together. When asked, interns reported that they never planned a lesson with their field instructor or course instructors, never made up a test together, never co-taught a lesson, and never met parents as a pair. Help from teacher educators was (in Chad's words) "one level above that" or, from Grossman et al. (2009), more focused on "learning about" teaching than on accomplishing the tasks of teaching (p. 275). Field instructors would ask interns after a lesson to identify whether it was "inquiry or application," rather than design an inquiry or application lesson with the intern. Teacher educators would provide assignments that asked interns to use a framework to design an intervention with a troubled student and provide feedback on that written design, rather than enact that intervention with the intern. Interns recognized the degree to which tasks were not accomplished when working with teacher educators. The classes held on State's campus and the evening meetings held with field instructors were considered valuable or therapeutic by many of the interns, but with the caveat that they took time away from, in Cindy's words, "all the things I have to get done for teaching. It's hard to focus sometimes (in Friday classes on campus) when I'm thinking about what's going on (in school) while I'm gone and what I'll have to do when I get back on Monday." Teacher education, despite its benefits to Cindy, was not where she got the things done she needed to do to teach.

Heather's separation strategies expose the dangers in this gap between tasks of teaching and ideas of teaching. As Heather realized that it was her ideas about teaching on which she would be evaluated by her TE course instructors, the conveyance of those ideas needed not be, in her view, encumbered by the realities of her practice. When she

justified her strategies by saying "I think that I am still benefitting in that I'm thinking about the problems of practice, things like that," the dichotomy she sees is clear—in TE, they are worried about my thinking, not what I am actually doing. When Heather counsels Cindy on the use of State "taglines," one hears in that dismissive tone the relative lack of value she places on the ideas and thinking being promoted in TE.

Support in Real-time for Teaching vs. Support for Planning and Reflection

Not only was there a distinction between *what* interns did with those in their ecology (tasks vs. idea), *when* interns worked on those tasks varied as well. As I described in Chapter 4, the support that interns received from their cooperating teachers often had a real-time component to it. Cooperating teachers would "step in" to assist their interns when things were going poorly, "direct interns' attention" in ways that helped interns notice things they might be missing, and "smooth things over" in order to reduce the complexity an intern might be facing.

Teacher educators did not participate in the moment of teaching; instead, they relied on interns' representations of their teaching written, read, and commented upon well after the event had occurred. Even field instructors, who were present in the moment when observing, waited until the post-observation conference to offer feedback, correction, or help. When interns planned a lesson or intervention using a structure provided by teacher educators (as for a course assignment), they did so in a less in-the-moment way than they might plan with a mentor; interns would write the lesson, send it electronically to their course instructor, and then wait for feedback from the instructor. With their cooperating teacher, planning for a lesson occurred as they sat together, in

moments when mentors could pull out a lab handout or set of notes that the intern could use during the rest of the planning session.

Given the task-orientation and immediacy of interns' field experiences, there were considerably fewer opportunities for looking ahead or looking back than one might think. Interns (with one exception) did not regularly debrief for long (more than five minutes) with their mentor after a lesson or at the end of a day. Instead, the exchanges were brief, much like the exchange described earlier in which Vince reminds Tammy to make sure that she keep things visual when presenting information to students. Interns and mentors did not spend time analyzing or replaying lessons, reconsidering decisions, or talking about rationales for why interns made particular instructional choices. That kind of talk came only with the field instructors or in course assignments. At least on the surface, the rationale is simple: there was another lesson to be taught tomorrow, papers to be graded, students to be tutored, and those priorities took precedence over significant amounts of time for debriefing or reflection.

Kimberly and Bonnie were the only exception. In the first few months of school, they spent close to 30 minutes at the end of every day reconstructing the lessons they had just taught, critiquing them, and thinking about changes they might have made. Only after the lessons had been thoroughly discussed would they turn to tomorrow's plans. I can only speculate on why this intern pair might have been different, but I suspect that Bonnie clocked more hours than other mentors *in her classroom*. Vince, Frank, Shannon, and Michael were all coaches or extracurricular event coordinators; Ken had a young child for whom he was primarily responsible for after school child care coordination. They were all committed teachers who worked hard and made themselves available to

their interns, but their time was limited and interns and mentors used that time to get the tasks done for the day. Bonnie, on the other hand, stayed after school every night until almost five o'clock tutoring students, but also working in her classroom. Kimberly stayed with her and the time together hanging out, talking, and working together may have opened up space for them in the schedule that permitted them the freedom to spend some time looking back with a lessened sense of urgency about getting ready for the next day.

Heather's ability to manipulate her journal entries and coursework also highlights the temporal differences between TE and her fieldwork. Ken kept close to his classroom during the day and commonly used many of the real-time assistance techniques I detailed above. While some mentors left the classroom for long stretches, he rarely did and never constrained his involvement when he was present. Recall an earlier example in which Ken and Heather discussed getting a video demonstration up and running and the alternatives they might attempt if it failed *while Heather was teaching*—her work with Ken had an in-the-moment quality. Conversely, Heather did not feel constrained to the present when writing her journals or completing assignments. She could pull an example from several weeks before, but write about it as though it occurred this Tuesday to make a point and without sanction. Likewise, she could reconstruct the weighing of alternatives and decision-making to fit the systematic process required for a course assignment. The work required of interns in TE lacked immediacy and Heather exploited that characteristic in strategies for keeping TE separate from the field.

Being a Teacher in the Field vs. Being a Student in TE

Interns in the field took on the physical characteristics of teachers—they embody teaching —while in TE, they remain student-like in their physical and social

characteristics even as they talk, write, and read about teaching. In addition, cooperating teachers as part of their assistance to interns include some "meta-talk" about the use of space, students' physical bodies, and the interns' use of their own body and voice; rarely did teacher educators discuss these things.

This might not be surprising given the geographic constraints of TE. Course instructors meet with interns at the university; none of the interns in my study ever had visits from course instructors to their school classrooms. No matter how interns might describe their settings, course instructors did not know interns' space, interns' students, or even how the intern taught. These things could, at best, be imagined through the constant flow of information provided by journal writing, other assignment, and classroom discussions. Furthermore, course instructors were expected to teach 20 interns, each with a unique physical setting and unique students—it is not surprising, then, that course instructors might focus on ideas that transcend any one intern or context. (Not to mention the fact that teacher educators were charged with preparing teachers to teach across many different curricula and in many different school systems, as their graduates might find jobs across the country.) The result, however, of this idea-oriented approach is that, in a physical sense, interns did not need to look and act like teachers when in teacher education classrooms. Interns sat and talked when and where they were directed, ironically just as students in interns' classroom might do. To the degree that teaching is "kinesthetic-conceptual" work, to the degree that the physical acts of teaching are connected through the body to the ideas of teaching promoted by teacher education, this separation of the body and mind intentionally or unintentionally enabled by the structure of TE coursework is a problem.

Heather, like all the interns, dressed and carried herself differently in the TE classroom than in her own classroom. Her dress was casual when on State's campus, usually involving athletic gear that reflected her interests in basketball, and she was a consummate multi-tasker, checking email (both personal and from Vincent High), reading the news, and even paying her bills online while class was conducted. At Vincent, she always dressed and acted professionally just as Ken did, her phone was turned off, and I never saw her check email or attend to something outside of the school setting. Cathleen worried that Heather "never got past being a student." It might be that Heather interpreted her TE experience as one that, in fact, encouraged her to remain a student in both embodied and intellectual ways.

Pedagogies of Enactment, Reflection, and Investigation

> Our views of teaching over the past several decades have evolved from an emphasis on teacher characteristics to a focus on teachers' behavior to more recent cognitive views of teachers as decision-makers and reflective practitioners. Teacher education has responded to this final turn towards the cognitive by shifting its focus from skills to knowledge and reflection. While clearly both of these are essential to the work of teaching, we want to argue that teacher education should move away from a curriculum focused on what teachers need to know to a curriculum organized around core practices, in which knowledge, skill, and professional identity are developed in the process of learning to practice. . . . We argue that teacher educators need to attend to the clinical aspects of practice and experiment with how best to help novices develop skilled practice. Taking clinical practice seriously will require us to add pedagogies of enactment to our existing repertoire of pedagogies of reflection and investigation. (Grossman, Hammerness, & McDonald, 2009, pp. 273-274)

These differences for interns between the world of TE and their school-based placements would only be of academic interest (in the pejorative sense) were it not for the findings reported in Chapter 3. For the interns in this study, their teaching and their beliefs about good teaching are shaped profoundly by their mentoring teachers' practices. As interns begin their practice, they mimic their mentors and follow the scripts mentors

write by example. And even as the scripting is pulled away and interns move toward a more independent practice, interns rely on their mentors' patterns of practice to shape the kind of teaching they try. Those that are "successful" in enacting this practice experience a corresponding shift in their beliefs that align them more closely to their mentors than when they entered, and those who are less successful leave the internship with an abstract and vague sense about the kind of teaching they would like to do. In most cases, the mentors' teaching does not match the reform-based interests promoted in the State's TE program. In other words, the highly influential practice of mentors—the single force in an intern's ecology seemingly most responsible for shaping the practice an intern engages in and believes—is outside the control of teacher educators and is, at best, benign in relationship to the messages of the teacher educators and, at worst, may even work against teacher educators' beliefs. Even granting that this study cannot speak to the influence of teacher educators and mentors on future practice (since interns were only followed as interns, not new teachers)—and while not surprising (given that the literature shows little effect of teacher education on practice)—it should trouble teacher educators that the teaching strategies and practices promoted in teacher education coursework and by field instructors were rarely practiced.

The typical explanations—the divide of theory and practice, the intellectually weak curriculum of teacher education—do not work here. Practice was at the center of the work of the teacher educators in the university, and the curriculum and assignments offered were rigorous and relevant. So why did schools and mentors dominate? Can the kinds of work that interns engage in these two different worlds (Chapter 4 and 5) help us understand this phenomenon?

Grossman, Hammerness, and McDonald (2009; see also Grossman & McDonald, 2008) argue that teacher education of late has been dominated by an emphasis on *pedagogies of reflection and investigation*, but have lacked a *pedagogy of enactment*. This shift toward the former, they argue, occurred as teacher educators and researchers emphasized the more cognitive components—"heady work" in Grossman and McDonald's (2008) words—viewing teaching as conceptual and intellectual. Reflection and investigation (defined broadly) are part of that emphasis. Pedagogies of enactment, on the other hand, account for the fact that "teaching, at its core, is an interactive, clinical practice, one that requires not just knowledge but craft and skill" (Grossman & McDonald, 2008, p. 189). A key component of these pedagogies of enactment is the opportunity for novices to engage in "approximations of practice" which "include opportunities to rehearse and enact discrete components of complex practice in settings of reduced complexity" (Grossman, Hammerness, & McDonald, 2009, p. 282). An overemphasis on reflection and investigation, they argue, has contributed to a teacher education in which student teachers learn more *about* teaching than they do the abilities and skills need *to* teach. While Grossman, Hammerness, and McDonald (2009) propose a change in the pedagogies of university-based teacher education (a point I will return to shortly), the distinction between the pedagogies of enactment and the pedagogies of reflection and investigation can be useful in explaining why the school-based fieldwork seems to swamp the influence of teacher education.

Pedagogies of Reflection and Investigation in TE

The world of TE that interns encountered, both in courses and through field instruction, was filled with a pedagogy that supported and encouraged reflection and

investigation. In courses, interns learned how to systematically inquire into their own practice—selecting problems, identifying alternative explanations, and designing and analyzing interventions. Following the idea-orientation of their instructors, interns were asked to connect their school experiences to ideas, theories, and frameworks they read about or discussed. While intended to promote a more thoughtful and reflective kind of teaching, interns tended to learn *about* teaching rather than how to enact a certain instructional skill in a specific classroom. When at the end of the internship Cindy (in this chapter's opening vignette) lets her classmates know that she "can use the words" of inquiry but still does not know "how (she) would actually use it in (her) classroom," one can sense how far from enactment she might be. Likewise, field instructors use of journals to evaluate interns (even informally) centers on the ability of interns to produce texts that are thoughtful and reflective rather than evaluating on the description of the enacted practice or, in the case of Heather, occasionally imagined practice. In the world of TE described here, it is the thinking about teaching that is promoted and evaluated most.

There is nothing wrong with a pedagogy of investigation or reflection. Indeed, teacher educators, who are charged with helping interns take their concrete experiences from one year of teaching and learn from them about what to do in other classrooms in other settings in other times need to help interns learn both to theorize and to look carefully at what actually happened in their classrooms.

Pedagogies of Enactment in Schools

When being taught with pedagogies of enactment, new teachers would have the opportunity to practice taking on the role and practices of the teacher rather than the

student. As I have described and similar to the findings of Grossman, Compton, et al. (2009), rarely did interns have "opportunities to rehearse and enact discrete components of complex practice in settings of reduced complexity" when interacting with members of their ecology most closely connected to teacher education (Grossman, Hammerness, & McDonald, 2009, p. 282). On the other hand, interns encounter "approximations of practice" in their schools. Each of the three variations of real-time assistance that mentors provide for interns as they teach (stepping in, directing interns' attention, and smoothing things over) acts to reduce the complexity and risks of teaching for the interns, thus allowing them to "rehearse and enact" instruction. When Kimberly's students begin to herd toward the door before the bell has rung, Bonnie steps in and directs students back to their seats. Without Bonnie's intervention, students might have developed a pattern of cutting short Kimberly's instructional time. Bonnie prevents that from happening, keeps Kimberly from "paying" for her mistake in the future, and provides Kimberly with a humorous way of diffusing a situation like that if it occurs again. When mentors direct interns' attention, they help interns make sense of, in James' words, the "blooming, buzzing confusion" of the classroom. Students around the room are talking, working, laughing, flirting, on-task, off-task, and even missing; cooperating teachers make sense of that chaos more quickly than an intern might, can detect when the noise in the corner is cause for concern, and in directing attention to some issues and not others, allow the intern to "practice" resolving the issue even if they were not yet skilled enough to detect it quickly. Finally, by smoothing over potential problems by, for example, standing next to the talkative student, cooperating teachers keep the complexity of the classroom lower than it would be were they not there. Interns still rehearse and enact the role of the

teacher, but they do so with a few less things (that talkative student and whoever he or she might disrupt) to worry about.

Furthermore, the task orientation of the work that interns and their mentors do also served to approximate the full practice of teaching that an intern was learning to enact. When Chad and Frank wrote a test together, Chad was engaging in the practice of writing assessments but with a reduced complexity and less risk. If Chad were to suggest a problem entirely inappropriate for the quiz, Frank would notice that and provide support for Chad in selecting a different problem, or when Chad makes a good suggestion, Frank can affirm that decision quickly. As interns complete the daily tasks of teaching with their mentors (e.g., planning, writing email to parents), they do so in ways that approximate the practice they will engage in on their own as teachers.

Finally, part of approximating the practice of teaching involves embodying the role of the teacher. Just as learning to play the piano requires putting one's fingers on the keys (Lampert, 2005) or learning to be a physical therapist requires manipulating patients' bodies (Rose, 1999), being a teacher involves physical and bodily dimensions that can be approximated through pedagogies of enactment. In the school sites, interns were expected to take on the physical persona of a teacher —to dress like a teacher, move around the classroom like as an authoritative figure, to give directions to students—all before they necessarily believed themselves to be a teacher or were recognized as such by the students in the classroom. They could rehearse that persona, modify it until it felt right to them, again without the risk that as they did so they would face failure. When an intern mimicked her mentor by borrowing a joke, imitating body language, or repeating a phrase, she enacted a practice not quite as complex as the one she might in a few years

when the jokes, movements, and sayings would be entirely her own. Likewise, mentors helped them reduce the complexity of this physical and bodily work as they counseled in the moment or provided advice shortly after teaching.

While Grossman et al. (2009) primarily focused on the role that instruction at the university might play in providing these approximations, the idea is helpful in thinking about why the experiences that mentors and schools provide might be so powerful in shaping interns. By viewing the work that mentors did with their interns, not as the inevitable result of a practical apprenticeship, but as the result of a pedagogy of enactment with identifiable characteristics, we may begin to see our way out of the theory/practice divide that had plagued teacher education for too long (Korthagen & Kessels, 1999). Grossman, Compton, et al. (2009) propose a continuum of authenticity in approximations of practice. It ranges from less authentic tasks in which novices participate narrowly in the practice being approximated to more authentic approximations in which the practice is more fully participated in by the novice in closer to real-time fashion. All points along this continuum are useful and can be seen in the work of interns in schools. When Chad assists Frank in writing a quiz, he is participating narrowly (Frank writes most of the questions), less authentically perhaps than he might later, but it is participation. When Kimberly teaches a lesson but receives an assist from Bonnie in the form of quieting a talkative student, it is a more authentic approximation in that Kimberly is fully participating in most of the components of the teaching and is doing so in real-time. Bonnie's help simply reduces the complexity by a small amount.

Still left somewhat hazy in Grossman and colleagues' conceptualization of pedagogies of enactment and in my analysis here is the relationship between pedagogies

of reflection, investigation, and enactment. Teacher educators might reasonably argue that investigation and reflection are part of teaching, part of the practice that teachers should enact. Consequently, the kinds of activities State teacher educators included in their courses are pedagogies of enactment—an enactment of a practice more richly defined than what is typical in schools. This line of thinking bears further investigation as teacher educators continue to struggle for what might be an appropriate balance between or integration of clinical and intellectual views of teaching and the pedagogies required of teacher educators.

Opportunities and Challenges

I wish to end by considering the opportunities and challenges that this study presents to teacher educators. Over 20 years ago, Cohen (1988) considered the question of why, after nearly a century of school reforms, teaching in school rarely reflected the more "adventurous" ideals promoted by reformers. Likewise, Kennedy (2005) found little evidence when she looked inside classrooms that attempts to reform teaching had made much progress. In science education, reform documents from important policy organizations (NRC, 1996, 2000) have called for significant restructuring of the kind of teaching and learning occurring in schools to emphasize inquiry and conceptual understanding, but large scale sampling of science classroom across the country suggests that little has changed (Weiss, Pasley, Smith, Banilower, & Heck, 2003).

And we can understand these results in light of this study. Despite entering a science teacher education program of high capacity that espoused reform-based principles, five of the six interns in this study rarely, if ever, engaged in a teaching practice that matched with what they had been taught in teacher education. Interns were

highly influenced by their mentors, mimicked them, sometimes successfully and sometimes not, but the teaching practice they engaged in during the internship closely followed that of their cooperating teacher. Cooperating teachers use pedagogies of enactment (consciously or unconsciously) with interns in the field; they structure authentic experiences for interns to engage in and provide the support necessary to reduce the complexity and risk to a level that interns can practice their mentors' practice. At least in the case of the reproducers, they do it well enough that interns manage to acquire that practice in almost all regards. The issue is: What practice? Not the one that reformers envision. When one wonders why reform efforts have not seemed to take hold, it is fair to ask whether part of the answer is that novice teachers have never been taught in a way that promotes enactment of those reforms. Most of the interns in this study may have been taught about reform-oriented teaching. But when they were taught to enact teaching, it was by their mentors and their experiences in the field, and the reforms that teacher educators desired were rarely present.

It may be that teacher educators have taken on a Sisyphean task—attempting to prepare novices to engage in adventurous teaching and then sending them into the field where those reform-oriented practices are socialized away. But if we can begin to understand how practice is learned, if we can begin to understand the process by which cooperating teachers are teaching interns, we may be able to better structure experiences in teacher education that get closer to affecting the enactment of practices by novice teachers. I report here on two promising ideas from the literature, neither of which use explicitly the term pedagogies of enactment, but who represent promising possibilities for designing approximations of practice.

Promising Attempts at Pedagogies of Enactment in Teacher Education

In an effort to help novice science teachers engage in reform-based science teaching, Windshitl, Thompson, and Braaten (2009) have developed a series of "tools" that novice teachers can use in support of teaching practices. For example, they have designed a protocol and rubric that supports students in evaluating student work and making decisions about instruction based on that information. The core of their teacher education curriculum centers on helping teachers learn to use the tools, practice with tools, as well as learning about the tools in more conceptual ways—this work can be done in teacher education classrooms. Even when preservice teachers head into the field—where they are unlikely to encounter mentoring teachers who engage in these practices—the tools themselves act to provide real-time support and feedback as these novices engage in authentic tasks of teaching. These are not reflection tools and are not designed only to help them think better about teaching, though that may occur. For example, the rubrics for evaluating student work can be used in the moment of assessment to help the novice make sense of his or her students' ideas, thereby reducing the complexity of the task. Windschitl et al. (2009) report that novice teachers using these tools make some progress toward using these more "ambitious" pedagogies. Their work serves as a well-developed example of what a pedagogy of enactment centered on approximations of practice might look like in the university setting.

Consider another example. The work of Ben Dotger and his Parent/Caregiver Conferencing Model (Dotger, 2009; Dotger & Smith, 2009) highlights how approximations of practices might embody teaching in ways similar to the work of the field. In Dotger's work, preservice teachers engage in simulated parent-teacher

conferences with trained actors portraying parents who have a variety of concerns about their son or daughter. The actors are given detailed interaction protocols that provide directions on body language, facial expressions, body positioning, as well as triggered responses that the actor should say if the preservice teacher responds in a particular way (Dotger, 2009). Because these events are video-recorded and standardized (in that each preservice teacher can talk to the "same" parent), instructors can use the events to guide analysis in ways that one could not given a "real" parent interaction; interaction can be slowed down, preservice teachers can "look" at themselves, they can compare notes with each other and with the instructor, and so on. In other words, they can *reflect* on their practice, but do so coupled to a lower-risk, simplified enactment under the influence of a teacher educator. In addition, this work highlights the embodied nature of parent/teacher interactions. Even though the preservice teachers know that the person before them is an actor, they confront their physiological response to confrontation, control the use of their tone of voice, and read the body language of the person before them. One student, Peter, was struck in reviewing his encounter by the smirk on his face and its impact on the way the parent reacted to him; "I'm pretty sure that he picked up on that because he kind of looked at me; I could tell by the look in his eye" (Dotger & Smith, 2009, p. 170). Peter became aware of his body and expression but also more attuned to the nonverbal reactions he receives from the parent.

One could imagine the ways in which this kind of work might be expanded to approximate and embody core instructional practices in addition to teachers' work with parents. An actor could be trained to present as students with behavioral or emotional problems or respond to a written prompt as a student with a learning disability might;

actors might be led by a preservice teacher in a group discussion of content, might be "pressed for understanding" or present particular misconceptions in conversation. In each case, teacher educators could limit the complexity of the situation to a level appropriate for the teacher's development, allow the teacher to rehearse practices that teacher educators' desire, while still encouraging reflection and inquiry through the use of the videotaping and debriefing.

Final Thoughts

The seeds for this study were sown in one of my earliest experiences as a teacher educator. Having taught interns for a full year (a course similar to TE Science), I began receiving requests from interns for letters of recommendation on their behalf. Having more time than good sense, I told them all that I would write the letters, but wanted to come see them teach first in order to make my letters more meaningful. Not all the interns took me up on the offer, but three did. In fact, my best three students—the most thoughtful, reflective, and studious of the bunch—scheduled me to come visit at a time of their choosing. Because they knew I was coming and because I thought they knew what I was all about, I expected to see lessons overdone with the kinds of teaching I promoted in class—student-centered inquiry, active learning, addressing student misconceptions and the like. I was not naïve enough to think they taught this way on a regular basis, but expected they would be putting their best foot forward.

It now comes as no surprise to me what I actually encountered. I scarcely saw evidence that they had ever attended my class. The lessons I saw were carefully planned (they *were* putting their best foot forward), and, because they were smart and conscientious people, the lessons went well in the way that most lessons throughout a day

in school come off with few hitches—well done, but quite traditional. At the time, it was jarring. Did my teaching really have so little impact that they could not do or did not know what I would want to see?

I see that situation now through the lens of this study as a problem of pedagogy. I knew my students to be thoughtful and reflective because that is what my teaching encouraged them to be and they were good students. It did not, however, support them in enacting the practice that I was promoting.

I am more hopeful now. By shifting some (but by no means all) of the effort that teacher educators and researchers have made toward developing pedagogies that encourage investigation and reflection toward the development of those that treat the clinical aspects of teaching as seriously, we as a field may make some progress toward preparing new teachers who are thoughtful and technically ready. But there are many unanswered questions. What kinds of approximations of practice can be done in teacher education classrooms that would promote desirable practices in the field? What are the core practices that teachers need when they leave a teacher education program—that would prepare them to start well and continue to improve? What kinds of relationships with teachers in the field might teacher educators develop that would allow for the cooperating teacher placements that work in conjunction with teacher education? In other words, there might be ways to shift the field and teacher education from pedagogies that compete against one another to ones that work in concert.

APPENDIX A

Intern Interviews (Before school year begins)

OUTCOMES
General visions of good teaching
1. Dreams and Goals (adapted from Newman, 2000) – Why did you choose teaching over other professions? Who influenced you in making your decision? How did that influence occur? Why did you choose to be a *science* teacher?
2. Do you have former teachers that have influenced the kind of teacher that you want to be? Can you tell me about them? What about them do you want to emulate or avoid?
3. Can you describe for me what you think good teaching looks like?

- If description doesn't seem science specific, ask: Does good *science* teaching look different in any ways?
- Probes: Is there anything else that stands out to you? Anything else you think is important?

Focal components of instruction:
4. CLASSROOM MANAGEMENT: How would you describe the classroom management style that you would like to have? What kinds of classroom management strategies will you use/emphasize? Why? What are the classroom management challenges that you think will be greatest during your internship? Why?
5. INQUIRY: Do you plan on using "inquiry" to teach science during your internship? What does inquiry mean to you? (If any emphasis or importance placed on inquiry – Why do you think it is important to use inquiry? Advantages and disadvantages on using inquiry? If no or little emphasis – why won't you use inquiry? Advantages and disadvantages of inquiry)
6. USING STUDENT IDEAS IN INSTRUCTION (from BouJouade, 2000): Describe in your own words the role of the teacher in the teaching/learning process. Describe in your own words the role of the student in the teaching/learning process. Describe in your own words how learning occurs.

APPENDIX B

Intern Interviews (2nd and 3rd interviews)

OUTCOMES
General visions of good teaching
1. Can you describe for me what you think good teaching looks like?

- If description doesn't seem science specific, ask: Does good *science* teaching look different in any ways?
- Probes: Is there anything else that stands out to you? Anything else you think is important?
- To what extent have you been able to do that kind of good teaching? Why or why not?

Focal components of instruction:
2. CLASSROOM MANAGEMENT: How would you describe the classroom management style that you have? Would like to have? What kinds of classroom management strategies do you use/emphasize? Why? What would you like to have? What are your greatest classroom management challenges? Why?
3. INQUIRY: Do you use "inquiry" to teach science? Why or why not? What does inquiry mean to you? (If any emphasis or importance placed on inquiry – Why do you think it is important to use inquiry? Advantages and disadvantages on using inquiry? If no or little emphasis – why won't you use inquiry? Advantages and disadvantages of inquiry)
4. USING STUDENT IDEAS IN INSTRUCTION (from BouJouade, 2000): Describe in your own words the role of the teacher in the teaching/learning process. Describe in your own words the role of the student in the teaching/learning process. Describe in your own words how learning occurs.

Ecology of Interaction

ST-CC
5. Tell me a little about what it is like to teach in this school? Strengths? Struggles?

ST – (CT—CC)
6. Describe your cooperating teacher as a teacher. What are his or her strengths and weaknesses as you see it? What kinds of things do you try to do like him or her? What kinds of things do you try to do differently?
7. How do you see your cooperating teacher's role in the school? How do you think parents view him or her? Other teachers? Administrators?

ST—CT
8. Describe your relationship with your cooperating teacher. Things that work well? Not so well?
9. Do you get help in your planning and teaching from your mentor? How does that work?

10. Do you get feedback from your mentor? What's that like? How helpful is it? How do you decide if you are going to use the feedback or not (or do you always use it)?

ST –US and ST—(US—CC)
11. Describe your relationship with your field instructor. Things that work well? Not so well?
12. Does your field instructor seem to understand your school? Why or why not?
13. Do you get help in your planning and teaching from your field instructor? How does that work?
14. Do you get feedback from your field instructor? What's that like? How helpful is it? How do you decide if you are going to use the feedback or not (or do you always use it)?

ST – (CT—US)
15. Does what you talk about with your cooperating teacher align with what you hear from your field instructor? What are the biggest similarities? What are the biggest differences?
16. What do you do when you have differences between your cooperating teacher's advice and the field instructor's advice? How do you make those decisions?

ST – TE
17. How helpful or unhelpful do you find the TE Professional courses? Why? What aspects are helpful? What aspects aren't helpful? Same questions for the TE Science courses?
18. Do you get help in planning and/or teaching from you course instructors or from the course meetings? How does that work?
19. Do you get feedback from your course instructors? What's that like? How helpful is it? How do you decide if you are going to use the feedback or not (or do you always use it)?

ST – (CT—TE)
20. Does what you talk about with your cooperating teacher align with what you hear in your teacher education courses? What are the biggest similarities? What are the biggest differences?
21. What do you do when you have differences between your cooperating teacher's advice and the teacher education's courses advice? How do you make those decisions?

ST – (US—TE)
22. Does what you talk about with your field instructor align with what you hear in your teacher education courses? What are the biggest similarities? What are the biggest differences?
23. What do you do when you have differences between your field instructor's advice and the teacher education's courses advice? How do you make those decisions?

OUTCOMES REVISITED
24. What have been your greatest accomplishments so far this year? What have been your greatest struggles?

25. How do you feel about teaching as a career right now? Do you see yourself teaching next year? How about longer term?

26. Any other questions or comments?

APPENDIX C

Interview - Cooperating teacher (early)

Background
1. How long have you been teaching? At this school?
2. Where did you go to college? Major? Teacher Certification? Masters degrees?
3. Experience as a cooperating teacher for seniors or interns? Any training as a mentor?

Teaching Philosophy
4. How would you describe yourself as a teacher? What are you strengths? Areas you'd like to improve upon, if any?
5. What do you enjoy about teaching? Not enjoy?
6. Why did you decide to go into teaching? Was it a good decision? Anything you regret?

Focal components of instruction:
7. CLASSROOM MANAGEMENT: How would you describe your classroom management style? What kinds of classroom management strategies do you use/emphasize? What are the classroom management challenges that you typically face?
8. INQUIRY: Do you ever use "inquiry" to teach science? What does inquiry mean to you? (If any emphasis or importance placed on inquiry – Why do you think it is important to use inquiry? Advantages and disadvantages on using inquiry? If no or little emphasis – why don't you use inquiry? Advantages and disadvantages of inquiry)
9. USING STUDENT IDEAS IN INSTRUCTION (from BouJouade, 2000): Describe in your own words the role of the teacher in the teaching/learning process. Describe in your own words the role of the student in the teaching/learning process. Describe in your own words how learning occurs.

Ecological Interactions
CT—CC
10. Tell me a little about what it is like to teach in this school. Good things? Struggles?
11. How do you see your role in the school community?

CT—TE
12. Tell me a little about you previous experience working with STATE seniors/interns? What do you think went well? What were the challenges? What did you enjoy/not enjoy?
13. How did you feel about the Opening Institute? What was helpful? Not helpful?

CT—US
14. When you mentored interns in the past, what was your interaction with the field instructor like? What went well? What were the challenges?
15. This year, your intern's field instructor is _____. Have you worked with them before? If so, can you tell me about that?

CT—ST
16. Why did you decide to be a mentor this year?

17. Prior to the year starting, did you have any contact with your intern? What was that like?
18. What are your impressions of your intern so far? Things he or she seems good at? Concerns you have at this point?
19. Any other comments?

APPENDIX D

Interview - Cooperating teacher (late)

Impressions of Year

1. So how do you think the year has gone with your intern? What have been the successes? What have been the struggles?
2. How would you describe you intern as a teacher? What are his or her strengths and weaknesses?
3. What are some ways in which the intern is similar to you as a teacher? Different from you?

Focal components of instruction:

4. CLASSROOM MANAGEMENT: How would you describe your intern's classroom management style? What kinds of classroom management strategies do he or she use/emphasize? What are the classroom management challenges that he or she faced?
5. INQUIRY: Do your intern ever use "inquiry" to teach science? If yes, can you give me a few examples of lessons that used inquiry? Do you think inquiry was used successfully by the intern? Why or why not? What do you think about the use of inquiry to teach science? Advantages or disadvantages
6. USING STUDENT IDEAS IN INSTRUCTION: Was your intern able to respond to student's ideas in his or her instruction? If so, can you give me a few examples of the kind of thing he or she would do? Was it successfully done by the intern? Why or why not?

Ecological Interactions

CT—ST

7. How would you describe your relationship with your intern? Strengths? Weaknesses?
8. How did you communicate with your intern? Provide feedback? Suggestions? How was that generally received and responded to by the intern?
9. Are there things that you think your intern learned from you this year? How do you think that happened?
10. Anything you've learned this year in working with your intern?

CT—CC and ST – (CT—CC)

11. Has this been a pretty typical year for you at your school? Any big changes or differences from past years?
12. How has your intern done in terms of interactions with the school? Students? Parents? Other teachers? Administrators?

CT—US and ST – (CT—US)

13. How has your experience working with the field instructor gone this year? Successes? Challenges?
14. Could you describe your interactions with the field instructor?
15. How would you describe your interns' relationship with his or her field instructor?

CT—TE and ST – (CT—TE)

16. What has your interaction with STATE (outside the field instructor) been like this year?
17. How much do you know about what your intern does in his STATE classes? Do you talk about the things they do in class? Assist with assignments he or she has completed?
18. What's your impression of the STATE courses? What ways are the helpful to the intern? Not helpful? Things they should emphasize more? Less?

19. Would you be a cooperating teacher again? Why or why not?
20. Any other comments?

APPENDIX E

Interview – University Supervisor (early)

Background
1. How long have you been a field instructor?
2. What's your teaching background? How long? What subjects? What schools?

Teaching Philosophy
3. (If previous teaching experience) How would you describe yourself as a teacher? What were you strengths? Areas you would have liked to have been better at, if any?
4. What did you enjoy about teaching? Not enjoy?
5. Why did you decide to go into teaching? Was it a good decision? Why did you decide to leave teaching (if relevant)?

Focal components of instruction:
6. CLASSROOM MANAGEMENT: How would you have described your classroom management style? What kinds of classroom management strategies did you use/emphasize? What are the classroom management challenges that you typically faced? What will you/ have you emphasized about classroom management to interns?
7. INQUIRY: Did you ever use "inquiry" to teach science? What does inquiry mean to you? (If any emphasis or importance placed on inquiry – Why do you think it is important to use inquiry? Advantages and disadvantages on using inquiry? If no or little emphasis – why don't you use inquiry? Advantages and disadvantages of inquiry). What will you/ have you emphasized about inquiry to interns?
8. USING STUDENT IDEAS IN INSTRUCTION: (from BouJaoude, 2000) Describe in your own words the role of the teacher in the teaching/learning process. Describe in your own words the role of the student in the teaching/learning process. Describe in your own words how learning occurs. What will you/have you emphasized about student learning to interns?

Ecological Interactions
US—CC
9. What do you know about the intern's school placement site? What strengths does it offer as a site for learning to teach? What challenges?

US—TE
10. (If experience as a field instructor for STATE) Tell me a little about you previous experience working with interns as a field instructor? What do you think went well? What were the challenges? What did you enjoy/not enjoy?
11. What kind of guidance and direction do you have from STATE in how your field instruction?

US--CT
12. When you field instructed interns in the past, what was your interaction with the cooperating teacher like? What went well? What were the challenges?

13. This year, your interns' cooperating teacher is _____. Have you worked with them before? If so, can you tell me about that?
14. Based on your interaction so far this year, what are your impressions?

US—ST
15. Did you know your intern prior to this year? If so, could you describe that relationship?
16. What are your impressions of your intern so far? Things he or she seems good at? Concerns you have at this point?
17. Any other comments?

APPENDIX F

Interview – University Supervisor (late)

Impressions of Year
1. So how do you think the year has gone with your intern? What have been the successes? What have been the struggles?
2. How would you describe you intern as a teacher? What are his or her strengths and weaknesses?

Focal components of instruction:
3. CLASSROOM MANAGEMENT: How would you describe your intern's classroom management style? What kinds of classroom management strategies did he or she use/emphasize? What are the classroom management challenges that he or she faced?
4. INQUIRY: Do your intern ever see your intern use "inquiry" to teach science? If yes, can you give me a few examples of lessons that used inquiry? Do you think inquiry was used successfully by the intern? Why or why not? What do you think about the use of inquiry to teach science? Advantages or disadvantages
5. USING STUDENT IDEAS IN INSTRUCTION: Was your intern able to respond to student's ideas in his or her instruction? If so, can you give me a few examples of the kind of thing he or she would do? Was it successfully done by the intern? Why or why not?

Ecological Interactions

US—ST
6. How would you describe your relationship with your intern? Strengths? Weaknesses?
7. How did you communicate with your intern? Provide feedback? Suggestions? How was that generally received and responded to by the intern?
8. Are there things that you think your intern learned from you this year? How do you think that happened?
9. Anything you've learned this year in working with your intern?

US--CT and ST – (US—CT)
10. How has your experience working with the cooperating teacher gone this year? Successes? Challenges?
11. Could you describe your interactions with the cooperating teacher?
12. How would you describe your interns' relationship with his or her field cooperating teacher?

US—CC and ST – (US – CC)
13. From your experience with the intern, how did his or her school placement site influence his or her internship?
14. What are you impressions of his or her school as a site for learning to teach? Strengths? Weaknesses?

US—TE and ST – (US—TE)

15. What kinds of guidance or support did you get from STATE in your field instruction? What was helpful? Not helpful? Why?
16. How much do you know about what interns do in their STATE classes? Do you talk about the things they do in class? Assist with assignments he or she has completed?
17. What's your impression of the STATE courses? What ways are the helpful to the intern? Not helpful? Things they should emphasize more? Less?

18. Any other comments?

APPENDIX G

Course Instructors
Background
1. How long have you been a course instructor?
2. What's your teaching background? How long? What subjects? What schools?

Teaching Philosophy
3. (If previous teaching experience) How would you describe yourself as a teacher? What were you strengths? Areas you would have liked to have been better at, if any?
4. What did you enjoy about teaching? Not enjoy?
5. Why did you decide to go into teaching? Was it a good decision? Why did you decide to leave teaching (if relevant)?

Focal components of instruction:
6. CLASSROOM MANAGEMENT: (If previous teaching) How would you have described your classroom management style? What kinds of classroom management strategies did you use/emphasize? What are the classroom management challenges that you typically faced? This year in your course, what kinds of things did you talk about or emphasize about classroom management?
7. INQUIRY (If a science teacher): Did you ever use "inquiry" to teach science? What does inquiry mean to you? (If any emphasis or importance placed on inquiry – Why do you think it is important to use inquiry? Advantages and disadvantages on using inquiry? If no or little emphasis – why didn't you use inquiry? Advantages and disadvantages of inquiry). What will you/ have you emphasized about inquiry to interns during your course?
8. USING STUDENT IDEAS IN INSTRUCTION: (from BouJaoude, 2000): Describe in your own words the role of the teacher in the teaching/learning process. Describe in your own words the role of the student in the teaching/learning process. Describe in your own words how learning occurs. What will you/have you emphasized about student learning to interns during your course?

Ecological Interactions
TE—ST
9. Did you know the intern prior to this year? If so, describe your relationship with them?
10. What kind of teacher do you think your intern is? What are his or her strengths and weaknesses? What kinds of things do you base your answer upon?
11. How did you communicate with your intern? Provide feedback? Suggestions? How was that generally received and responded to by the intern?
12. Are there things that you think your intern learned from you this year? How do you think that happened?
13. Anything you've learned this year in working with your intern?

TE—CC
14. What do you know about the intern's school placement site? What strengths does it offer as a site for learning to teach? What challenges?

15. In what ways, if any, were you able to relate course content to their field placement sites?

TE—CT
16. Describe your experience working or interacting with the intern's mentor this year, is any. For example, at meetings or through course assignments?

TE -- US
17. Describe your experience working or interacting with the intern's field instructor this year, if any. For example, at meetings or through course assignments?
18. Any other comments?

REFERENCES

Abrams, E., Southerland, S. A., & Silva, P. (2007). *Inquiry in the classroom: Challenges and possibilities*. Greenwich, CT: Information Age Publishing.

Achinstein, B., Ogawa, R. T., & Speiglman, A. (2004). Are we creating separate and unequal tracks of teachers? The effects of state policy, local conditions, and teacher characteristics on new teacher socialization. *American Educational Research Journal, 41*, 557-603.

Adams, P. E., & Krockover, G. H. (1997). Concerns and perceptions of beginning secondary science and mathematics teachers. *Science Education, 81*, 29-50.

Blankstein, A. M. (2004). *Failure is not an option: Six principles that guide student achievement in high-performing schools.* Thousand Oaks, CA: Corwin Press.

Borko, H., & Mayfield, V. (1995). The roles of the cooperating teacher and the university supervisor in learning to teach. *Teaching and Teacher Education, 11*, 501-518.

BouJaoude, S. (2000). Conceptions of science teaching revealed by metaphors and by answers to open-ended questions. *Journal of Science Teacher Education, 11*, 173-186.

Britzman, D. P. (1991). *Practice makes practice: A critical study of learning to teach.* Albany, New York: State University of New York Press.

Bruckerhoff, C. E., & Carlson, J. L. (1995). Loneliness, fear and disrepute: The haphazard socialization of a student teacher. *Journal of Curriculum Studies, 24*, 431-444.

Carlson, S. (2005, October 7). The Net Generation goes to college. *The Chronicle of Higher Education, 52*, p. A34.

Clift, R. T., & Brady, P. (2005). Research on methods courses and field experiences. In M. Cochran-Smith & K. Zeichner (Eds.), *Studying teacher education: The report of the AERA panel on research and teacher education*. Mahwah, New Jersey: Erlbaum.

Cohen, D. (1989). Teaching practice: Plus ca change . . . . In P. Jackson (Ed.), *Contributing to educational change: Perspectives on research and practice* (pp. 27-84). Berkeley, CA: McCutchan.

Cole, A. L., & Knowles, J. G. (1993a). Shattered images: Understanding expectations and realities of field experiences. *Teaching and Teacher Education, 9*, 457-471.

Cole, A. L., & Knowles, J. G. (1993b). Teacher development partnership research: A focus on methods and issues. *American Educational Research Journal, 30*, 473-495.

Dinkelman, T. (2003). Self-study in teacher education: A means and ends tool for promoting reflective teaching. *Journal of Teacher Education, 54*, 6-18.

Dotger, B. (2009). "I had no idea": Developing dispositional awareness and sensitivity through a cross-professional pedagogy. *Teaching and Teacher Education*, DOI : 10.1016/j.tate.2009.10.017.

Dotger, B. & Smith, M. (2009). "Where's the line?"—Negotiating simulated experiences to define teacher identity. *The New Educator, 5*, 161-180.

Eisenhart, M. A. (1988). The ethnographic research tradition and mathematics education research. *Journal for Research in Mathematics Education, 19*(2), 99-114.

Emerson, R. M., Fretz, R. I., & Shaw, L. L. (1995). *Writing ethnographic fieldnotes.* Chicago: The University of Chicago Press.

Erickson, F. (1986). Qualitative methods in research on teaching. In *Handbook of Research on Teaching* (3rd ed., pp. 119-161). New York: Macmillan.

Farkas, S., Johnson, J., & Foleno, T. (2000). *A sense of calling: Who teaches and why.* New York: Public Agenda.

Fay, J., & Funk, D. (1995). *Teaching with love & logic: Taking control of the classroom.* Golden, CO: Love and Logic Press.

Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teacher College Record, 103*, 1013-1055.

Feiman-Nemser, S., & Buchmann, M. (1985). Pitfalls of Experience in Teacher Preparation. *Teachers College Record, 87,* 53-65.

Fendler, L. (2003). Teacher reflection in a hall of mirrors: Historical influences and political reverberations. *Educational Researcher, 32*(3), 16-25.

Flores, M. A. (2006). Being a novice teacher in two different settings: Struggles, continuities, and discontinuities. *Teachers College Record, 108*, 2021-2052.

Flores, M. A., & Day, C. (2006). Contexts which shape and reshape new teachers' identities: A multi-perspective study. *Teaching and Teacher Education, 22*, 219-232.

Geertz, C. (1992). "Local knowledge" and its limits. *Yale Journal of Criticism, 5*(2), 129-135.

Glaser, B. (1978). *Theoretical sensitivity.* Mill Valley, CA: Sociology Press.

Goodlad, J. (1990). *Teachers for our nations' schools.* San Francisco: Jossey-Bass.

Graham, P. (1997). Tensions in the mentor teacher-student teacher relationship: Creating productive sites for learning within a high school English teacher education program. *Teaching and Teacher Education, 13*, 513-527.

Graham, P. (1999). Powerful influences: A case of one student teacher renegotiating his perceptions of power relations. *Teaching and Teacher Education, 15*, 523-540.

Grossman, P., Compton, C., Igra, D., Ronfeldt, M., Shahan, E., & Williamson, P. W. (2009). Teaching practice: A cross-professional perspective. *Teachers College Record, 111*, 2055-2100.

Grossman, P., Hammerness, K., & McDonald, M. (2009). Redefining teaching, re-imagining teacher education. *Teachers and Teaching: Theory and Practice, 15,* 273-289.

Grossman, P. & McDonald, M. (2008). Back to the future: Directions for research in teaching and teacher education. *American Educational Research Journal, 45,* 184-205.

Guyton, E., & McIntyre, D. J. (1990). Student teaching and school experiences. In W. R. Houston (Ed.), *Handbook of research on teacher education* (pp. 514-534). New York: MacMillan.

Hebert, E., & Worthy, T. (2001). Does the first year of teaching have to be a bad one? A case study of success. *Teaching and Teacher Education, 17*, 897-911.

Hess, F. M. (2001). *Tear down this wall: The case for a radical overhaul of teacher certification.* Progressive Policy Institute.

Hewitt, P. G. (2009). *Conceptual Physics* (11th ed.). Menlo Park, CA. Addison-Wesley.

Hewson, P. W., Tabachnick, B. R., Zeichner, K. M., Blomker, K. B., Meyer, H., Lemberger, J., et al. (1999). Educating prospective teachers of biology: Introduction and research methods. *Science Education, 83*, 247-273.

Hewson, P. W., Tabachnick, B. R., Zeichner, K. M., & Lemberger, J. (1999). Educating prospective teachers of biology: Findings, limitations, and recommendations. *Science Education, 83*, 373-384.

Hoy, A. W., & Spero, R. B. (2005). Changes in teacher efficacy during the early years of teaching: A comparison of four measures. *Teaching and Teacher Education, 21*, 343-356.

Hoy, W. K., & Rees, R. (1977). The bureaucratic socialization of student teachers. *Journal of Teacher Education, 28*, 23-26.

Hoy, W. K., & Woolfolk, A. E. (1990). Socialization of student teachers. *American Educational Research Journal, 27*, 279-300.

Holmes Group. (1986). *Tomorrow's teachers.* East Lansing, MI: Holmes Group.

Jay, J. K., & Johnson, K. L. (2002). Capturing complexity: A typology of reflective practice for teacher education. *Teaching & Teacher Education, 18*, 73-85.

Johnston, A. (2008). Demythologizing or dehumanizing? A response to Settlage and the ideals of open inquiry. *Journal of Science Teacher Education, 19*, 11-13.

Kauchak, D. P., & Eggen, P. D. (1993). *Learning and teaching: Research-based methods* (2nd ed.). Boston, MA: Allyn and Bacon.

Kelchtermans, G., & Ballet, K. (2002). The micropolitics of teacher induction: A narrative-biographical study on teacher socialisation. *Teaching and Teacher Education, 18*, 105-120.

Kennedy, M. (2005). *Inside teaching: How classroom life undermines reform.* Cambridge, MA: Harvard University Press.

Korthagen, F. A. J. (1993). Two modes of reflection. *Teaching and Teacher Education, 9*(3), 317-326.

Korthagen, F. A. J. (2001). *Linking practice and theory: The pedagogy of realistic teacher education.* Mahwah, NJ: Lawrence Erlbaum Associates.

Korthagen, F. A. J. (2004). In search of the essence of a good teacher: Towards a more holistic approach in teacher education. *Teaching and Teacher Education, 20*, 77-97.

Korthagen, F. A. J., & Kessels, J. P. A. M. (1999). Linking theory and practice: Changing the pedagogy of teacher education. *Educational Researcher, 28*(4), 4-17.

Korthagen, F. A. J., & Lagerwerf, B. (1996). Reframing the relationship between teacher thinking and teacher behaviour: Levels in learning about teaching. *Teachers and Teaching: Theory and Practice, 2*, 161-190.

Lacey, C. (1977). *The socialization of teachers.* London: Methuen.

Lanier, J. E., & Little, J. W. (1986). Research on teacher education. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed.). New York: Macmillan.

Latour, B. & Woolgar, S. (1986). *Laboratory life: The construction of scientific facts.* Princeton, NJ: Princeton University Press.

LeCompte, M. D., & Preissle, J. (1993). *Ethnography and qualitative design in educational research* (2nd ed.). San Diego, CA: Academic Press, Inc.

Lemberger, J., Hewson, P. W., & Park, H. (1999). Relationships between prospective secondary teachers' classroom practice and their conceptions of biology and of teaching science. *Science Education, 83*, 347-371.

Levine, A. (2006). *Educating school teachers*. Washington DC: The Education Schools Project.

Lortie, D. C. (2002). *Schoolteacher* (2nd ed.). Chicago: The University of Chicago Press.

Loughran, J. J. (2002). Effective reflective practice: In search of meaning in learning about teaching. *Journal of Teacher Education, 53*, 33-43.

Mansvelder-Longayroux, D. D., Beijaard, D., & Verloop, N. (2007). The portfolio as a tool for stimulating reflection by student teachers. *Teaching and Teacher Education, 23*, 47-62.

McIntyre, D. J., Byrd, D. M., & Fozz, S. M. (1996). Field and laboratory experiences. In J. Sikula, T. Buttery & E. Guyton (Eds.), *Handbook of research on teacher education*. New York: MacMillan.

Mewborn, D. S. (2000). Learning to teach elementary mathematics: Ecological elements of a field experience. *Journal of Mathematics Teacher Education, 3*, 27-46.

Meyer, H., Tabachnick, B. R., Hewson, P. W., Lemberger, J., & Park, H. (1999). Relationships between prospective elementary teachers' classroom practice and their conceptions of biology and of teaching science. *Science Education, 83*, 323-346.

Miles, M. B., & Huberman, A. M. (1984). *Qualitative data analysis: A sourcebook for new methods*. Beverly Hills, CA: Sage Publications.

Moore, R. (2003). Re-examining the field experiences of preservice teachers. *Journal of Teacher Education, 54*, 31-42.

National Research Council. (1996). *National science education standards*. Washington DC: National Academy Press.

National Research Council. (2000). *Inquiry and the national science education standards*. Washington, DC: National Academy Press.

Newman, C. S. (2000). Seeds of professional development in pre-service teachers: A study of their dreams and goals. *International Journal of Educational Research, 33*, 125-217.

Palmer, D. (1995). The POE in the primary school: An evaluation. *Research in Science Education, 25*, 323-332.

Powell, R. R. (1994). From field science to classroom science: A case study of constrained emergence in a second-career science teacher. *Journal of Research in Science Teaching, 31*, 273-291.

Powell, R. R. (1997). Teaching alike: A cross-case analysis of first-career and second-career beginning teachers' instructional convergence. *Teaching and Teacher Education, 13*, 341-356.

Rose, M. (1999). "Our hands will know": The development of tactile diagnostic skill—teaching, learning, and situated cognition in a physical therapy program. *Anthropology & Education Quarterly, 30*, 133-160.

Ross, E. W. (1988). Preservice teachers' responses to institutional constraints: The active role of the individual in teacher socialization. *Educational Foundations, 2*, 77-92.

Sadler, T. D. (2006). "I won't last three weeks": Preservice science teachers reflect on their student-teaching experiences. *Journal of Science Teacher Education, 17*, 217-241.

Schon, D. A. (1983) *The reflective practitioner: How professionals think in action.* London: Temple Smith.

Settlage, J. (2007). Demythologizing science teacher education: Conquering the false ideal of open inquiry. *Journal of Science Teacher Education, 18*, 461-467.

Slick, S. K. (1997). Assessing versus assisting: The supervisor's roles in the complex dynamics of the student teaching triad. *Teaching and Teacher Education,13,* 713-726.

Slick, S. K. (1998). The university supervisor: A disenfranchised outsider. *Teaching and Teacher Education, 14*, 821-834.

Sowell, S., Southerland, S., & Granger, E. (2006, April). *Exploring the construct of teacher pedagogical discontentment: A tool to understand teachers' openness to reform?* Paper presented at the meeting of the American Educational Research Association, San Francisco, CA.

Sundli, L. (2007). Mentoring: A new mantra for education? *Teaching and Teacher Education, 23*, 201-214.

Sykes, G. & Bird, T. (1992). Teacher education and the case idea. *Review of Research in Education, 18*, 457-521.

Tabachnick, B. R., & Zeichner, K. M. (1984). The impact of the student teaching experience on the development of teacher perspectives. *Journal of Teacher Education, 35*, 28-36.

Tabachnick, B. R., & Zeichner, K. M. (1999). Idea and action: Action research and the development of conceptual change teaching of science. *Science Education, 83*, 309-322.

Tang, S. Y. F. (2003). Challenge and support: The dynamics of student teachers' professional learning in the field experience. *Teaching and Teacher Education, 19*, 483-498.

Tigchelaar, A., & Korthagen, F. (2004). Deepening the exchange of student teaching experiences: Implications for the pedagogy of teacher education of recent insights into teacher behaviour. *Teaching and Teacher Education, 20*, 665-679.

Veenman, S. (1984). Perceived problems of beginning teachers. *Review of Educational Research, 54*, 143-178.

Weber, S., & Mitchell, C. (1995) *'That's funny, you don't look like a teacher': Interrogating images and identity in popular culture*. London: Falmer Press.

Weinstein, C. S. (2003). *Middle and secondary classroom management: Lessons from research and practice* (3rd ed.). Boston: McGraw-Hill.

Weiss, I.R., Pasley, J.D., Smith, P.S., Banilower, E.R., & Heck, D.J. (2003). *Looking inside the classroom: A study of K-12 mathematics and science education in the U.S.* Chapel Hill, NC: Horizon Research.

Wideen, M., Mayer-Smith, J., & Moon, B. (1998). A critical analysis of the research on learning to teach: Making the case for an ecological perspective on inquiry. *Review of Educational Research, 68*, 130-178.

Wilson, C. D., Taylor, J. A., Kowalski, S. M., & Carlson, J. (in press). The relative effects and equity of inquiry-based and commonplace science teaching on students' knowledge, reasoning, and argumentation. *Journal of Research in Science Teaching.*

Wilson, S. M., Floden, R. F., & Ferrini-Mundy, J. (2001). *Teacher preparation research: Current knowledge, recommendations, and priorities for the future.* Seattle, WA: Center for the Study of Teaching Policy, University of Washington.

Wilson, S. M., Floden, R. E., & Ferrini-Mundy, J. (2002). Teacher preparation research: An insider's view from the outside. *Journal of Teacher Education, 53*, 190-204.

Windschitl, M. (2004). Caught in the cycle of reproducing folk theories of "inquiry": How pre-service teachers continue the discourse and practices of an atheoretical scientific method. *Journal of Research in Science Teaching*, 41, 481-512.

Windschitl, M., Thompson, J., & Braaten, M. (2009, April). *Fostering ambitious pedagogy in novice teachers: The new role of tool-supported analyses of student work.* Paper presented at the annual meeting of the National Association for Research in Science Teaching, Garden Grove, CA.

Winitzky, N., Stoddart, T., & O'Keefe, P. (1992). Great expectations: Emergent professional development schools. *Journal of Teacher Education, 43*, 3-18.

Wong, H. K., & Wong, R. T. (1998). *The first days of school: How to be an effective teacher.* Mountain View, CA: Harry K. Wong Publications.

Wubbels, T., Korthagen, F., & Broekman, H. (1997). Preparing teachers for realistic mathematics education. *Educational Studies in Mathematics, 32*, 1-28.

Zeichner, K. M. (1986). Content and contexts: Neglected elements in studies of student teaching as an occasion for learning to teach. *Journal of Education for Teaching, 12*, 5-24.

Zeichner, K. M., & Gore, J. M. (1990). Teacher socialization. In W. R. Houston (Ed.), *Handbook of research on teacher education* (pp. 329-348). New York: MacMillan.