RECONCEPTUALIZING PROFESSIONAL DEVELOPMENT: A CASE STUDY OF PROFESSIONAL LEARNING COMMUNITY ACTIVITIES AND TEACHER IMPROVEMENT IN A FIRST-YEAR MIDDLE SCHOOL

By

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A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Education in the School of Education.

Chapel Hill
2006

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ABSTRACT

PARRY GRAHAM: Reconceptualizing professional development: A case study of professional learning community activities and teacher improvement in a first-year middle school

(Under the direction of Dr Fenwick English)

Using a theoretical model developed from recent research on organizational behavior and professional development, the purpose of this concurrent triangulation, mixed method case study was to describe in detail the relationship between professional learning community activities and teacher improvement for core middle school teachers in a first year school adopting DuFour's (2004b) professional learning community principles. Specifically, the study focused on three areas: the features of professional learning community activities that exhibited a relationship to changes in teachers' content and pedagogical knowledge and skills, along with changes in teachers' instructional practices; the efficacy of professional learning community activities in relation to teacher grade level, subject area, and years of teaching experience; and organizational and leadership factors that influenced the efficacy of professional learning community activities.

The study used a case study format and focused on a first-year middle school that had incorporated DuFour's (2004b) professional learning community principles. After selecting an appropriate test site using a set protocol, the study relied on three types of data. Quantitative data focusing on the nature of professional learning community activities were collected from core academic 6th, 7th, and 8th grade teachers using Garet et al.'s (1999) Teacher Activity Survey. Qualitative data were collected from interviews with a purposefully selected group of ten teachers and from a review of school documents.

A comparative analysis of quantitative and qualitative data indicated that significant differences existed between grade levels in terms of the impact of professional learning community activities on teacher improvement, and that 6th and 7th grade teachers exhibited high degrees of professional improvement as a result of participation in PLC activities. The efficacy of professional learning community activities depended on a number of factors, including leadership and organizational practices, the substantive details of PLC activity meetings, the nature of conversations in PLC activities, and the development of community among PLC teams.

ACKNOWLEDGMENTS

This dissertation represents four years of work and the collective support and encouragement of numerous people. I would like to acknowledge and thank all those who helped me to reach this point in my career and professional growth.

First and foremost, I would like to thank the staff of Central Middle School. They graciously allowed me access to their thoughts, ideas, and experiences, and I can only hope that my work might somehow support the development of their school.

I would like to thank my dissertation committee—Dr. William Malloy, Dr. Neil Shipman, and Dr. Jim Veitch—whose support, tutelage, and professional feedback were invaluable throughout my doctoral program. I would especially like to thank Dr. Fenwick English, my committee chair, whose consistent exhortations to "KEEP WORKING", and whose thoughtful and insightful feedback pushed me to make this dissertation something of which I believe I can be proud.

I would like to thank my friends and colleagues, whose words of encouragement and praise meant more than they probably realized. Among this group, I would especially like to thank Adam, Bill, Matt, and Thad—your questions and feedback helped me to understand and clarify the ideas contained in this dissertation—and I would like to thank Melissa, to whom I still owe dinner for helping me with my data collection.

Finally, I would like to thank my family: my mother, who never tired of hearing me talk about my research and always had good questions; my brother, who bet me that I couldn't get it done on time; my daughter, whose naps gave me the necessary hours to get the writing done; and my wife, whose support and flexibility (moving to North Carolina,

for example) made this possible. And lastly, I would like to dedicate this work to my father, who would have been proud to see this accomplishment.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Introduction

While education has been an important issue in the United States for many years, passage of the No Child Left Behind Act in 2001 pushed issues of teaching and learning to the forefront of the American consciousness. The national debate over the most effective means of improving K-12 education encompasses topics as far-ranging as the promise of new technologies, the injection of market competition via school vouchers, and the use of high-stakes accountability testing. Figuring prominently in the federal education budget, however, is a more traditional focus—increased funding for teacher training and recruitment. In 2002, for example, the federal government authorized more than 3 billion dollars for teacher and principal training and recruiting (No Child Left Behind, 2002). And this focus is not arbitrary: while always recognized anecdotally, over the last 15 years teacher effectiveness has become the subject of considerable quantitative and qualitative research, with a growing body of literature suggesting that the classroom teacher can have a significant impact on student learning and achievement (Darling-Hammond, 2000; McCaffrey et al., 2003; Sanders & Rivers, 1996; Wenglinsky, 2002; Wright et al., 1997).

The most effective way to improve teaching quality, however, is a contentious issue, largely because the constituent elements of teacher effectiveness are still a topic of debate. While numerous studies and policy proposals have addressed teacher inputs—such as salary, education level, and certification requirements—in an attempt to improve teacher efficacy, a number of recent reports and meta-analyses question the relationship

between teacher inputs and teacher effectiveness (Darling-Hammond & Youngs, 2002; Wenglinsky, 2000). According to Wenglinsky (2000), "Research has not consistently demonstrated a link between teacher inputs, such as salaries and education levels, and student outcomes, such as scores on standardized tests" (p.6). Instead, a counter body of research makes a compelling case that teachers' impact on student achievement is less dependent on teacher inputs and more a function of daily, classroom-level curricular and instructional decision-making (Joyce & Showers, 2002; Stigler & Hiebert, 1999; Wenglinsky, 2000, 2002).

Given these insights—that teachers are a primary school-based link to student achievement, and that pedagogical quality is the key lever in the teacher-student dynamic—the federal support of teacher professional improvement represents a logical and important investment. And, for school-based leaders working to maximize student learning and achievement, identifying opportunities to encourage and support classroom-level teacher improvement is a top priority. This is especially true at the middle school level, where issues of student learning and teacher quality are manifest. In a review of data from the Third International Math and Science Study (TIMSS), Heller et al. (2002) noted that, "In mathematics and science, U.S. fourth-graders reached a higher achievement level than their peers in almost every other developed nation. By the eighth grade, U.S. students had slipped to the middle of the list of nations and under-performed even students from several less-developed nations" (p.1). Some researchers attribute this drop in achievement to teacher quality issues at the middle grades, resulting in part from uneven state licensing practices (Cooney, 1998; Heller et al., 2002). According to Cooney (1998), "Because of practices in teacher preparation, licensure and assignment to

classrooms, too many teachers in the middle grades have too little knowledge of the subjects they teach" (p.1). For the middle school principal, supporting teacher improvement is critical.

Recognizing the importance of teacher effectiveness in the arena of student achievement and school improvement, this study attempted to explore the way in which teacher effectiveness can be impacted by organizational structure. Specifically, this study focused on the relationship between professional learning community activities and teacher improvement in a first-year middle school. The professional learning community model represents an organizational approach that emphasizes faculty commitment to a mission of ensuring student learning, high levels of collaboration, and regular reflection on student and school data. Using a case study approach, the professional learning community structure was explored as an alternative approach to teacher improvement.

Traditionally, teacher improvement efforts at the district and school levels have manifested themselves under the formal designation of *professional development*. While professional development typically comes in the form of school-, district-, or conference-based workshops (Ball, 1996; Darling-Hammond, 1996; Garet et al. 2001; Little, 1994; Sparks, 1994), it can be more broadly defined as "the provision of activities designed to advance the knowledge, skills, and understanding of teachers in ways that lead to changes in their thinking and classroom behavior" (Fenstermacher & Berliner, 1985, p.283). In an effort to deconstruct the concept and efficacy of professional development, researchers have worked to identify the characteristics that comprise and define the types of "high quality" professional learning opportunities likely to lead to positive changes in instructional behavior. In particular, a series of seminal, large-scale professional

development studies have been completed in the last decade that identify in detail those features of professional development that research suggests are most likely to lead to improvements in teacher effectiveness (Garet et al., 1999, 2001; US Department of Education, 2000). Specifically, these studies identify six structural and core features (identified in Figure 1) that have been identified as relating to instructional improvements. In general, the three structural features support or mediate the effectiveness of the core features, serving as the "wrapper" within which professional learning takes place. The three core features comprise the "agenda" of training: the training curriculum, the nature of activities, etc.

Figure 1: Professional development features related to instructional improvements

Structural Features	Core Features
Type of activity: For example, traditional workshop versus reform models, such as study groups or peer mentoring (Ball, 1996; Darling-Hammond, 1996; Little, 1994; Loucks-Horsley et al., 2003; Sparks, 1994; Stiles et al., 1996)	**Focus on content:** The degree to which professional development develops teacher knowledge of content area (Cohen & Hill, 1998; Kennedy, 1998; Sparks, 1994; Stigler & Hiebert, 1999)
Duration: Includes both contact hours and span of time covered (Cohen & Hill, 1998; Little, 1994; Stiles et al., 1996; Wenglinsky, 2000).	**Promoting active learning:** Includes four dimensions, specifically 1) observing and being observed in the classroom; 2) planning classroom implementation (e.g., practicing under simulated conditions, discussing classroom implementation with colleagues); 3) reviewing student work; and 4) presenting, leading, and writing (e.g., giving a lecture or presentation, conducting a demonstration of a lesson) (Darling-Hammond and McLaughlin, 1996; Finley et. al., 2000; Garry & Graham, 2004; Loucks-Horsley et. al., 2003)
Collective participation: Grouping participants by some common characteristic, such as grade level, discipline, school, etc. (Ball, 1996; DuFour, 2004b; Hirsh, 2004; Loucks-Horsley et al., 2003; Newmann & Associates, 1996)	**Fostering coherence:** Includes three dimensions, specifically 1) connecting with goals and other activities (e.g., teachers' professional development goals); 2) aligning with state and district standards and assessment; and 3) communicating with other teachers (Darling-Hammond and McLaughlin, 1996; Finley et. al., 2000; Garry & Graham, 2004; Laine, 2000; National Staff Development Council, 2001)

Despite the growing consensus around the features of effective professional development, school- and district-based professional development activities often fail to incorporate these features (Ball, 1996; Darling-Hammond, 1996; Garet et al. 2001; Little, 1994; Sparks, 1994). Even teachers in the same school regularly report participating in uneven professional development experiences that vary significantly in quality from teacher to teacher and from year to year (U.S. Department of Education, 2000). Efforts in a more positive direction, however, do exist. In contrast to the isolated, one-time

workshops or conferences that traditionally comprise professional development offerings (Ball, 1996; Darling-Hammond, 1996; Garet et al. 2001; Little, 1994; Sparks, 1994), a variety of alternative, or reform-type professional development activities have become increasingly popular. Examples of these alternative types include study groups, professional networks, and mentoring relationships (Loucks-Horsley et al., 2003), and many researchers and experts have suggested that these reform-type activities may respond more effectively to teachers' needs (Ball, 1996) and demonstrate a greater propensity to lead to changes in teacher instructional behaviors (Darling-Hammond, 1996; Loucks-Horsley et al., 2003; Stiles et al., 1996). Nevertheless, effective and consistent school-based professional development programs are few and far between (Ball, 1996; Darling-Hammond, 1996; Garet et al. 2001; Little, 1994; Sparks, 1994; U.S. Department of Education, 2000).

Rick DuFour (2004a) takes the concept of alternative professional development one step further. He argues that, rather than treating professional development as a distinct and separate entity or area of focus (which is the common approach), teacher improvement should be approached as a natural byproduct of larger *organizational management* strategies. While consistent with the notion of reform-type professional learning, this approach changes the conceptualization of professional development per se. Within this model, a school leader addresses teacher improvement tangentially, encouraging actions such as teacher collaboration, dialogue, and reflection through organizational structures and expectations rather than through formalized and scheduled "professional development" experiences. Professional development therefore becomes an integral part of daily routines, nominally indistinguishable from regular organizational

behaviors, i.e., organizational structure becomes a primary agent directly mediating teacher professional growth. In DuFour's words, "the best staff development happens in the workplace rather than in a workshop" (DuFour, 2004a, p.63).

DuFour's assertion that organizational structure and philosophy can connect to educational outcomes is supported by a growing literature base (Darling-Hammond, 1996; Hord, 1997; Little et al., 1994; McLaughlin & Talbert, 1993; Rosenholtz, 1989). For example, in a summary of five years of research conducted at the Center for Research on the Context of Secondary School Teaching, McLaughlin and Talbert (1993) noted that "teachers' responses to today's students and notions of good teaching practices are heavily *mediated by the character of the professional communities* in which they work" (p.8, emphasis in original). In an evaluation of high school restructuring efforts, Lee et al. (1995) found that schools organized under an "organic" model (which includes certain structural elements, such as reduced hierarchy and increased collaboration) experienced higher achievement rates and smaller achievement gaps than more traditionally structured schools.

In commenting on Lee et al.'s (1995) work, however, Rowan (1995) cautioned that, "It is not structural change per se that creates successful schools. Instead, structural changes succeed in improving school performance only if they are consistent with, and support changes in, work practices (e.g., authentic instruction), and only if they are undertaken by a committed work force of teachers." (p.15) DuFour's model of organizational structure, which he calls a "professional learning community" (DuFour & Eaker, 1998), recognizes this focus on work practices and emphasizes specific work-related organizational behaviors: by DuFour's (2004b) definition of a professional

learning community, school leaders should require teachers to establish individual and organizational commitment to a common mission and goals centered around ensuring student learning; collaborate regularly on curricular, instructional, and organizational decisions; and collect and analyze organizational data and results. Echoing Rowan's (1995) focus on work practices, DuFour (2004a) argues that:

> When teachers work together to develop curriculum that delineates the essential knowledge and skills each student is to acquire, when they create frequent common assessments to monitor each student's learning on a timely basis, when they collectively analyze results from those assessments to identify strengths and weaknesses, and when they help each other develop and implement strategies to improve current levels of student learning, they are engaged in the kind of professional development that builds teacher capacity and sustains school improvement. (p.63)

At first blush, then, the professional learning community model appears to offer an alternative path to teacher improvement, incorporating professional learning experiences that are, at least in theory, both consistent throughout a school (given that all teachers are engaged in the same cooperative work practices) and related to curricular and instructional decision-making. In addition, the professional learning community principles seem to fit well with the traditional middle school structure: according to Heller et al. (2002), "Flexible scheduling practices and teacher collaboration have long been seen as hallmarks of the 'middle school model'" (p.9). There is, however, little research in this area. While it is possible to identify a *theoretical* model with potential relationships between professional learning community activities and teacher

improvement, any connections between the PLC model and teacher improvement *in practice*, especially at the middle school level, remain under-identified and under-explained. Returning to the professional development literature, Garet et al.'s (1999) study provides a possible link in describing any potential connections. Garet et al.'s (1999) study identified the features of "high quality" professional learning experiences that connect to improvements in teacher content and pedagogical knowledge and skills, and to improvements in teacher instructional practices; their study therefore provides a specific language and framework to describe and explore the relationship between professional learning community strategies and changes in teacher effectiveness (for a graphical representation of this model, see Appendix A). For the middle school leader wishing to act on DuFour's advice and use the professional learning community model as a possible means to achieve improvements in teaching and learning, connecting the dots between organizational strategies and educational outcomes is neither simple nor assured—as is true in so many facets of educational leadership, the devil rests in the details. As a model for teacher improvement, the professional learning community framework is still not understood.

Statement of the Problem

The professional learning community model has become an education fad in recent years, spawning numerous articles (for example, Huffman, 2003; Richardson, 2001), books (for example, Barth et al., 2005; Hord, 2003), and journal volumes (for example, *Educational Leadership*, 2004) that sing the praises of the PLC approach. At the middle school level, the PLC model seems to fit with the common middle school

practice of flexible scheduling and team-based collaboration (Heller et al., 2002). But little research exists describing either whether or how the professional learning community model can support teacher improvement. This study addressed this challenge by focusing on the following three problems:

1. It is unclear which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and pedagogical knowledge and skills and with changes in teachers' instructional practices for middle school teachers.
2. It is unclear whether or not the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on middle school teachers' years of experience, grade level, or subject area.
3. It is unclear how organizational and personnel factors—specifically, intra-organizational social dynamics, the personality and leadership style of the principal, structured planning time, and use of a block schedule—influence the teacher improvement efficacy of professional learning community activities for middle school teachers.

Purpose of the Study

Using a theoretical model developed from recent research on organizational behavior and professional development (see Appendix A), the purpose of this concurrent triangulation, mixed method case study was to describe in detail the relationship between professional learning community activities and teacher improvement for core middle

school teachers in a first year school adopting DuFour's (2004b) professional learning community principles. In particular, this study was undertaken to provide middle school leaders with a detailed model of the efficacy of PLC principles as an alternative professional development vehicle for teacher improvement. The case study began with a review of a possible research site, in which teacher interview data and school documents were analyzed using a designated protocol to determine the fidelity of application of DuFour's (2004b) professional learning community principles. After the test site was determined, the case study relied on both quantitative and qualitative components to address the research question. In the quantitative stage of the study, the professional development survey developed by Garet et al. (1999) was used to collect data from all core academic teachers at the research site to: A) identify the features of professional learning community activities, if any, that demonstrated a significant relationship with changes in both teachers' content and pedagogical knowledge and skills and teachers' instructional practices; and B) identify any variation in the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, based on years of teaching experience, grade level taught, and subject taught. In the qualitative stage of the study, teacher interviews and school documents were analyzed to explore in greater depth the inter-relationship of professional learning community activities, professional development features, teacher and school characteristics, improvements in individual teachers' knowledge and skills, and individual teacher instructional behavior changes. Specifically, this case study focused on 6^{th}, 7^{th}, and 8^{th} grade Language Arts, Math, Science, and Social Studies teachers in a first year middle school in a large, semi-urban district in North

Carolina, utilizing professional development survey and interview data, along with school documents, to address the research question: What is the relationship between professional learning community activities and teacher improvement in schools adopting DuFour's (2004b) model of a PLC?

Research Design

The study used a case study format and focused on a first-year school that had incorporated DuFour's (2004b) professional learning community principles. Because schools are complex organizations, and any relationship between professional learning community activities and teacher improvement is likely to reflect that complexity, the case study approach was well suited for the study—according to Merriam (1998), "The case study offers a means of investigating complex social units consisting of multiple variables of potential importance in understanding the phenomenon" (p.41). Furthermore, the intent of the study was to research a specific phenomenon in depth, exploring the detailed interconnectedness of professional learning community activities and teacher improvement. Given this research intent, working with a single case study made sense: "a single case or small nonrandom sample is selected precisely *because* the researcher wishes to understand the particular in depth" (Merriam, 1998, p.209, emphasis in the original). In addition, the use of a first-year school increased the chances of schoolwide fidelity to professional learning community principles. Most, if not all school community members in a first-year school have been present from the outset, suggesting that exposure to and participation in professional learning community activities should have a greater chance for consistency across school staff members than would be the case in an

existing school, thereby broadening the opportunity for data collection. In their own study of a teacher learning community, Grossman et al. (2001) recognized the challenges inherent in studying the formation of community in existing schools, noting that, "What we did not appreciate until later was how working with a group of teachers who already knew each other would affect the formation of community. In many ways, starting with a group of colleagues who have worked together may be worse than convening a group of perfect strangers" (p.949).

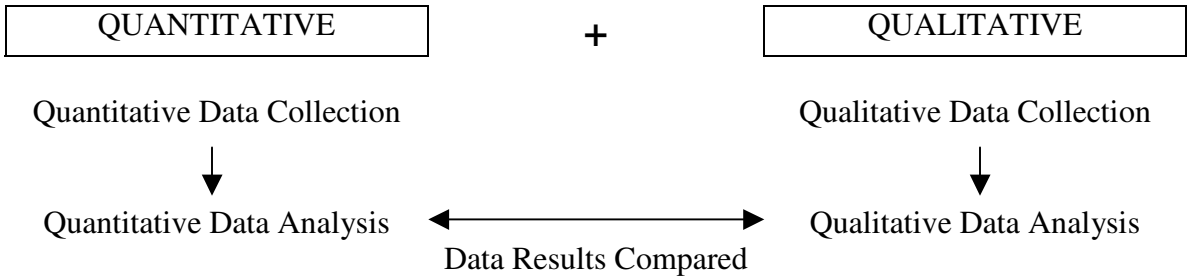
The first stage of the study involved the selection of an appropriate test site, i.e., a first-year "professional learning community" middle school modeled after DuFour's (2004b) description of a PLC. The study began with an analysis of teacher interview data and school documents from a possible site to determine the fidelity of application of DuFour's (2004b) professional learning community principles. Using a designated protocol, school practices were compared against DuFour's (2004b) definition and description of a professional learning community (see Appendix B for a copy of the site selection protocol). Once a test site was selected, the study then relied on two sets of primary data sources—one quantitative and the other qualitative—to address the research question. First, in an attempt to identify the relationship between professional learning community activities and teacher improvement, 6^{th}, 7^{th}, and 8^{th} grade core teachers at the test site were asked to complete Garet et al.'s (1999) professional development survey concerning the professional learning community activities in which they had participated. The results were used to: A) identify the features of professional learning community activities, if any, that demonstrated a significant relationship with changes in teachers' content and pedagogical knowledge and skills and instructional practices; and B) identify

any variation in the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, based on years of teaching experience, grade level taught, and subject taught. Second, a purposefully selected group of teachers from the same school participated in qualitative interviews focusing on the inter-relationship of professional learning community activities, professional development features, teacher and school characteristics, improvements in individual teachers' knowledge and skills, and individual teacher instructional behavior changes. School documents were also analyzed to support the analysis of these relationships.

The case study relied on a concurrent triangulation approach, which uses two complementary research methods to confirm, cross-validate, or corroborate findings within one study (Creswell, 2003; Greene et al., 1989). According to Greene et al. (1989), "[W]hen two or more methods that have offsetting biases are used to assess a given phenomenon, and the results of these methods converge or corroborate one another, then the validity of inquiry findings is enhanced" (p.256). Data from the surveys were collected concurrently but separately from interview and document data, and results were then compared during the data analysis and interpretation stages (see Figure 2). Because of the interpretive and descriptive nature of the study, coupled with the intent to identify schoolwide relationships, a mixed-methods approach was preferable to a single methodology. The use of survey data from core teachers and document data from across the school supported the identification of generalizeable trends across the organization (i.e., broad relationships that are true at aggregate organizational and sub-group levels), while interview data allowed for the identification of individual experiences within the

larger organizational context. In this way, the research question was addressed at both the macro (i.e., organizational) and micro (i.e., individual) levels, drawing a final picture that is intended to be both valid in its interpretations and rich in its descriptions.

Figure 2: Concurrent Triangulation research design (Creswell, 2003, p.214)



Assumptions of the Study

The following assumptions existed in the study:

1. Teacher characteristics have an impact on student achievement.
2. Teacher effectiveness relates to teacher use of curricular and instructional strategies.
3. Teacher effectiveness relates to student achievement.
4. Teacher effectiveness is an acquired and dynamic characteristic that can change over time.
5. There is a positive relationship between defined professional development characteristics and teacher effectiveness.
6. Content and pedagogical knowledge and skills relate to teacher effectiveness.
7. Teacher survey and interview responses were truthful and accurate.

8. Professional learning community activities can support teacher development and improvement.
9. The professional development features identified by Garet et al. (1999), which were developed with data from math and science teachers, also apply to professional development efforts with language arts and social studies teachers.
10. The types of instructional changes identified in Garet et al.'s (1999) Teacher Activity Survey represent instructional improvements; that is, instructional changes that are likely to result in increased student learning.
11. Any impact of professional learning community activities on teacher development can be qualitatively distinguished from additional organizational- and personnel-related factors that may influence teacher development.
12. The test site met DuFour's (2004b) definition of an active professional learning community.

Limitations of the Study

The study was limited by the following factors:

1. *Theoretical model:* The study used a specific theoretical model to define the mechanism of teacher improvement through the lens of high-quality professional development. While this model was drawn from the literature, it does necessarily exclude certain teacher improvement perspectives and professional development characteristics that have been identified in other contexts (Guskey, 2003). Any conclusions drawn from the study are limited to those activities exhibiting the professional development features identified by Garet et al. (1999). In addition,

the study used DuFour's (2004b) definition of a professional learning community. Other definitions of a professional learning community exist in the literature base, and by choosing Dufour's definition some components of the professional learning community model emphasized by other authors may not have been considered.

2. *Characteristics of the school and participants:* The test site was a first-year middle school that serves a high achieving (as measured by state standardized tests) and predominately majority, high SES student population. In addition, the school's faculty was new to the school and was selected based on specific criteria by the building principal. While these characteristics made the test site an excellent candidate for a case study, any identified relationships between professional learning community activities, professional development characteristics, and teacher development should not be seen as specifically generalizeable to general school and teacher populations.
3. *Specific professional learning community activities:*The study aimed to examine the relationship between professional learning community activities, professional development features, and teacher development, but any conclusions are limited to the specific professional learning community activities documented at the research site.
4. *Teacher perceptions:* Teacher surveys and interviews rely on teacher perceptions of professional learning community activities and self-reported changes in content knowledge and instructional practices. Teachers' perceptions represent important

data when evaluating professional development efficacy (Mullens et al., 1996), but they represent only one perspective.

5. *Purposefully sampled teacher interviews:* The proposed study relied on purposeful sampling for teacher interviews. In purposeful sampling, the researcher selects "participants…that will best help the researcher understand the problem and the research question" (Creswell, 2003, p.185), and the purposeful sample in the study included representatives from all grade levels and subject areas of the targeted teacher population, along with various levels of teaching experience. Nevertheless, the information that was gained from purposefully selected interviews may not represent the experiences of the entire teacher population at the test site.
6. *Alternative organizational and personnel factors contributing to teacher development:* Through qualitative interviews and document review, the study attempted to identify alternative organizational and personnel factors that might have impacted teacher development, and both separate these alternative factors from any documented impact of professional learning community activities and their characteristics while also contextualizing the interconnectedness of these other factors. The complex nature of schools suggests that no one set of teacher improvement criteria can be fully extricated from the greater organizational environment; while the study resulted in suggested relationships between professional learning community activities and teacher development, the role of alternative factors must also be acknowledged.

7. *Researcher relationship to proposed test site:* The researcher spent ten months working as an administrative intern at the test site prior to the advent of the study. While this allowed the researcher expanded insight into the context of professional learning activities at the proposed research site, it might also have affected the way in which teachers reacted to interview questions (e.g., teachers may have felt compelled to provide overly positive information or to censor information because of the researcher's previous position as an administrator and relationship with existing administrators), and might have biased both the types of questions asked by the researcher and the interpretation of interview data (e.g., the researcher may have failed to ask some questions because the answers seemed obvious to one who worked in the school, or the researcher may have interpreted data partially through the lens of pre-conceived notions based on personal experiences). In an attempt to address this bias in the data gathering process, a second interviewer with no relationship to the school or district conducted several of the interviews, and the data analysis process included a comparison of the data from both interviewers.

Research Questions and Hypotheses

The study was designed to address the following research questions and hypotheses:

Question #1: Which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and

pedagogical knowledge and skills and with changes in teachers' instructional practices for core academic middle school teachers in a first year school?

Hypotheses related to question #1:

- The following professional development features, as components of professional learning community activities, will have no relationship to improvements in teacher content and pedagogical knowledge and skills: collective participation, focus on content, promoting active learning, and fostering coherence.
- The following professional development features, as components of professional learning community activities, will have no relationship to changes in teacher instructional practice: collective participation, focus on content, promoting active learning, and fostering coherence.

Question #2: Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics—including years of teaching experience (divided into the three categories reported by North Carolina schools: 0-3 years, 4-10 years, and 10+ years), grade level taught, and subject taught— for core academic middle school teachers in a first year school?

Hypotheses related to question #2:

- There will be no difference in the identified level of collective participation (+/- .5 point on 0 to 2 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.

- There will be no difference in the identified level of focus on content (+/- .5 point on 0 to 2 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
- There will be no difference in the identified level of promoting active learning (+/- 5 points on a 0 to 20 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
- There will be no difference in the identified level of fostering coherence (+/- 2.25 points on a 0 to 9 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
- There will be no difference in the identified level of changes in content and pedagogical knowledge and skills (+/- 1 point on a 1 to 5 point scale), as a result of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
- There will be no difference in the identified level of changes in instructional practice (+/- .75 on a 0 to 3 point scale), as a result of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.

Question #3: In what ways do organizational and personnel factors—specifically, intra-organizational social dynamics, the personality and leadership style of the principal, structured planning time, and use of a block schedule—influence the teacher

improvement efficacy of professional learning community activities for core academic middle school teachers in a first year school?

Definition of Terms

For the purposes of this study, the following definitions were used:

- *Teacher effectiveness*—The ability of a teacher to "make students learn" (Wenglinsky, 2000, p.3), which is a direct function of a teacher's knowledge of and skills in:
    - *Content*, which includes "both the topics of instruction… and the teacher's expectations for student performance" (Garet et al., 1999, p.2-4); and
    - *Pedagogy*, which includes "the types of activities used in instruction" (Garet et al., 1999, p.2-4).
- *Teacher improvement, teacher development, teacher growth (used synonymously throughout)*—Enhancements in classroom teaching that are likely to result in improved student learning (Garet et al., 1999, p.2-1). These enhancements in classroom teaching result from changes in a teacher's knowledge and skills related to *content* and *pedagogy* (see *teacher effectiveness* above).
- *Professional development*—"[T]he provision of activities designed to advance the knowledge, skills, and understanding of teachers in ways that lead to changes in their thinking and classroom behavior" (Fenstermacher & Berliner, 1985, p.283).
- *High quality professional development*—Professional development that incorporates the structural and core features identified by Garet et al. (1999).
- *Structural professional development features*—Includes:

- *Type of activity,* e.g., traditional workshop versus reform models, such as study groups or peer mentoring;
- *Duration*, which includes both contact hours and span of time covered;
- *Collective participation*, i.e., grouping participants by some common characteristic, such as grade level, discipline, school, etc.

- *Core professional development features*—Includes:
  - *Content*, i.e., the degree to which professional development develops teacher knowledge of content area;
  - *Promoting active learning*, which includes four dimensions, specifically 1) observing and being observed in the classroom; 2) planning classroom implementation (e.g., practicing under simulated conditions, discussing classroom implementation with colleagues); 3) reviewing student work; and 4) presenting, leading, and writing (e.g., giving a lecture or presentation, conducting a demonstration of a lesson);
  - *Fostering coherence*, which includes three dimensions, specifically 1) connecting with goals and other activities (e.g., teachers' professional development goals); 2) aligning with state and district standards and assessment; and 3) communicating with other teachers.
- *Professional learning community*—A model of school organizational management marked by A) a commitment to ensuring student learning, B) a culture of collaboration, and C) a focus on student and school results (DuFour, 2004b).

- *Core academic teachers*—Teachers who teach any one of the academic subjects Language Arts, Math, Science, or Social Studies.
- *Middle School teachers*—Teachers who teach at the 6^{th}, 7^{th}, or 8^{th} grade levels.

Chapter 2

Literature Review

> The premise is that the improvement of American education relies centrally on the development of a highly qualified teacher workforce imbued with the knowledge, skills, and dispositions to encourage exceptional learning in all the nation's students. The related hypothesis is that the key to producing well-qualified teachers is to greatly enhance their professional learning across the continuum of a career in the classroom. (Sykes, 1999, p. xv)

In the 2000/2001 school year, total expenditures for U.S. K-12 education approached $350 billion. Of that total, $194 billion, or approximately 56% of total expenditures, went to salaries and benefits for teachers and instructional aids (U.S. Department of Education, 2003b). This financial focus reflects the human capital-based structure of elementary and secondary education: people are the primary resource in our nation's schools and they represent the largest financial investment. And with good reason—a growing body of research suggests that the classroom teacher has more influence on student learning and achievement than any other school-based factor (Darling-Hammond, 2000; Sanders & Rivers, 1996; Wenglinsky, 2002; Wright et al., 1997). Improving teacher quality has therefore become an increasingly important priority at the local, state, and federal levels. In 2002, for example, the federal government

authorized more than $3 billion for teacher and principal training and recruiting as part of the No Child Left Behind legislation (No Child Left Behind, 2002).

The most effective means of improving teacher quality, however, is a topic of debate. Numerous studies and policy proposals have explored a focus on teacher inputs at the pre-service front end—for example, by increasing teacher salaries, recruiting candidates with higher education levels, or tightening certification requirements—as a means to improve teacher efficacy (Darling-Hammond & Youngs, 2002; Ehrenberg & Brewer, 1995; Fetler, 1999; Goldhaber & Brewer, 2000; Greenwald et al., 1996; Rowan et al., 1997; U.S. Department of Education, 2003a; Wilson et al., 2001). A separate body of research suggests that efforts to improve existing teachers' instructional strategies and classroom decision-making represent a more effective path (Joyce & Showers, 2002; Stigler & Hiebert, 1999; Wenglinsky, 2000, 2002), while a third line of inquiry suggests that specific organizational management strategies can serve to mediate and support improvements in teacher quality (Darling-Hammond, 1996a; DuFour 2004a, 2004b; DuFour & Eaker, 1998; Lee et al., 1995).

This section of the study will review the literature surrounding the relationships between teacher characteristics, student learning, professional development, and organizational management. This section begins with a discussion of the relationship between student learning and teacher characteristics. It then moves to a description of teacher improvement, focusing on the professional development and organizational management strategies connected through the literature to teacher improvement efforts, including a detailed summary of the research on Garet's (1999) features of high-quality professional development. After a brief discussion of the professional learning

community model, this section concludes with a discussion of the conceptual relationship between professional learning community activities (DuFour, 2004b) and Garet's (1999) features of high-quality professional development.

For a definition of the professional learning community model, this study used that provided by Rick DuFour (2004b). While DuFour is not the only researcher to define the professional learning community concept (for example, Hord, 1997), his definition is prominent in the literature, it was the definition that had been used at the research site, and it is a definition that shares much in common with other professional learning community descriptions. According to DuFour (2004b), a professional learning community is an organization that emphasizes individual and organizational commitment to common goals, collaborative work and decision-making, and an attention to organizational data and results.

In defining high-quality professional development, this study relied on the characteristics identified by Garet et al. (1999) in their three-year, national study, which related professional development characteristics to changes in teachers' knowledge, skills, and instructional behaviors. Garet et al. (1999) identified six structural and core professional development features:

- Type of activity
- Duration
- Collective participation
- Focus on content
- Promoting active learning
- Fostering coherence

While there have been numerous lists of high-quality professional development characteristics identified in the literature in the last decade (for example, American Federation of Teachers, 2002; Kent & Lingman, 2000; National Staff Development Council, 2001), Garet's (1999) six features provided an ideal theoretical lens for this study for four reasons. First, Garet's (1999) list shares many of the primary features identified by other lists (Guskey, 2003). Second, Garet's (1999) list is based on features that relate directly to changes in teacher instructional behaviors, the variable most likely to lead to improvements in student achievement (Garet et al., 1999, 2001; Joyce & Showers, 2002; U.S. Department of Education, 2000; Wenglinsky, 2002). Third, Garet's (1999) features have been used before as a theoretical lens in conducting educational research (Odden et al., 2002). And fourth, while many other professional development lists are based solely on qualitative data and expert opinion, Garet's (1999) list is based on both qualitative and quantitative analyses, focusing on professional development features that have demonstrated a statistical relationship to teacher instructional behavior changes in large data sets (Garet et al., 1999, 2001; U.S. Department of Education, 2000).

The Relationship Between Student Achievement and Teacher Characteristics

The passage of the No Child Left Behind Act in 2001 re-emphasized an almost 20-year focus at the federal level on student achievement. Beginning in 1983 with the publication of *A Nation at Risk* and punctuated from time to time by national and international education reports, such as the TIMSS report (National Center for Education Statistics, 1996), the underperformance of American elementary and secondary students relative to some national expectations has created a sense of educational urgency and

crisis. Addressing this "crisis", however, is a complex and politically charged endeavor, hinging in large part on one's assumptions about the complex inter-relationship between student and school-based characteristics and student achievement. Going back almost 40 years, the *Coleman Report* (officially titled *Equality of Educational Opportunity*) held as one of its major findings that student background had a far greater impact on student achievement than did school characteristics (Coleman et al., 1966), suggesting that efforts within the public school system could have limited influence on student learning. Research since then has both supported and contradicted this finding, with the current climate at a bit of a stalemate: student background and family characteristics strongly influence student achievement, but schooling factors can also have a significant impact (McCaffrey, 2003; Sanders & Rivers, 1996; Stigler & Hiebert, 1999; Wenglinsky, 2000, 2002; Wright et al., 1997).

Among the school-based factors contributing to student achievement, recent research suggests that teacher effectiveness is by far the most important (Darling-Hammond, 2000; Sanders & Rivers, 1996; Wenglinsky, 2000, 2002; Wright et al., 1997). While a strong relationship between teacher effectiveness and student achievement has been well documented in both the qualitative and quantitative literature bases, identifying exactly what constitutes "teacher effectiveness" has nevertheless proved to be a difficult task. In one direction, numerous studies and policy proposals have reviewed or emphasized the importance of teacher inputs—such as salary, education level, scores on literacy exams, and certification requirements—as the primary indicators and determinants of teacher quality (Darling-Hammond & Youngs, 2002; Ehrenberg & Brewer, 1995; Fetler, 1999; Goldhaber & Brewer, 2000; Greenwald et al., 1996; Rowan

et al., 1997; U.S. Department of Education, 2003a; Wilson et al., 2001). Despite the national policy focus in the area of inputs, however, the link between teacher inputs and student achievement has been shown to be somewhat tenuous (Darling-Hammond & Youngs, 2002; Wenglinsky, 2000). According to Wenglinsky (2000), "Research has not consistently demonstrated a link between teacher inputs, such as salaries and education levels, and student outcomes, such as scores on standardized tests" (p.6).

Instead, a growing body of qualitative and quantitative research suggests that teachers' impact on student achievement is primarily a function of curricular and instructional strategies and classroom decision-making (Joyce & Showers, 2002; Wenglinsky, 2000, 2002). For example, in a follow-up to the TIMSS report, which identified international disparities in terms of student achievement in math and science, Stigler & Hibert (1999) videotaped eighth grade math teachers in the U.S., Germany, and Japan, and then worked with a panel of experts to identify patterns in instructional practice. As they reviewed the tapes, one expert offered his interpretation of what he saw:

> Actually, I believe I can summarize the main differences among the teaching styles of the three countries… In Japanese lessons, there is the mathematics on one hand, and the students on the other. The students engage with the mathematics, and the teacher mediates the relationship between the two. In Germany, there is the mathematics as well, but the teacher owns the mathematics and parcels it out to students as he sees fit, giving facts and explanations at just the right time. In U.S. lessons, there are the students and there is the teacher. I have trouble finding the

mathematics; I just see interactions between students and teachers. (p. 25-26)

In general, the project researchers came to typify instruction by U.S. teachers as emphasizing "learning terms and practicing procedures", as opposed to Japanese "structured problem solving" and German "developing advanced procedures" (p.27). Throughout the study, it was the *quality of instruction* and *patterns of explicit instructional strategies related to the content* that, for the researchers, explained student achievement disparities.

In another particularly compelling study, Wenglinsky (2002) used 1996 NAEP scores from eighth grade mathematics students to examine the relationships between student achievement and teacher classroom practices, teacher professional development, and the aforementioned "teacher inputs", controlling for student-based factors, such as SES. Wenglinsky (2002) found that, taken together, teacher practices, professional development, and a single teacher input, teacher major (i.e., having majored in the subject taught), had at least an equivalent impact on student achievement as did student SES (to some extent contradicting the earlier findings of the aforementioned *Coleman Report*, Coleman et al., 1966). Among the school-based variables, teacher major had a slight impact, professional development dealing with special student populations (i.e., individualizing instruction) and focusing on developing students' higher-order thinking skills had a moderate impact, and teaching strategies focusing on higher-order thinking skills, problem-solving skills, and hands-on learning had a significant impact. Wenglinsky's (2002) results suggest that teacher effectiveness is minimally a result of a teacher's content knowledge (i.e., having majored in the subject area), somewhat a result

of a teacher's access to high-quality professional development (depending upon the type of professional development), and largely a result of the specific classroom practices a teacher chooses to employ.

In a study reminiscent of Wenglinsky (2002), Niemi & Smith (2001) looked at the relationship between course content, instructional methods, and student achievement scores on 1994 history NAEP scores. While course content correlated positively with student achievement, it proved to be less important that instructional practice; according to Niemi & Smith (2001), "[I]t is clear that instructional changes have the most powerful relationship to student performance" (p.38). Specifically:

> [S]tudents who experienced instruction that used more primary reading sources, required more and longer writing tasks, engaged students in active discussion, and utilized learning tools beyond simple textbooks did much better on these achievement scales." (p. 37)

Niemi & Smith's (2001) findings echo Wenglinsky's (2002): students achieve at higher levels when teachers focus on specific course content and favor specific pedagogical strategies.

Teacher Improvement: Connections to Professional Development and Organizational Management

The concept of teacher improvement, therefore, is strongly connected in the literature base to notions of teachers' *content knowledge* and *pedagogical knowledge* (Borko & Putnam, 1995; Joyce & Showers, 2002, Niemi & Smith, 2001; Stigler & Hibert, 1999; Wenglinsky, 2002). Content knowledge refers to "both the topics of

instruction… and the teacher's expectations for student performance" (Garet et al., 1999, p.2-4), while pedagogical knowledge refers to "the types of activities used in instruction" (Garet et al., 1999, p.2-4). Traditionally, efforts to improve teachers' content and pedagogical knowledge have fallen under the umbrella of *professional development*. Unfortunately, for many educators the term "professional development" conjures up images of one-time in-service workshops or conferences, focused on a topic poorly aligned with teachers' needs and interests, and delivered in a "spray and pray" approach that lacks both follow up and collegial interaction (Ball, 1996; Darling-Hammond, 1996; Garet et al. 2001; Little, 1994; Sparks, 1994). More broadly defined, however, professional development refers to "the provision of activities designed to advance the knowledge, skills, and understanding of teachers in ways that lead to changes in their thinking and classroom behavior" (Fenstermacher & Berliner, 1985, p.283).

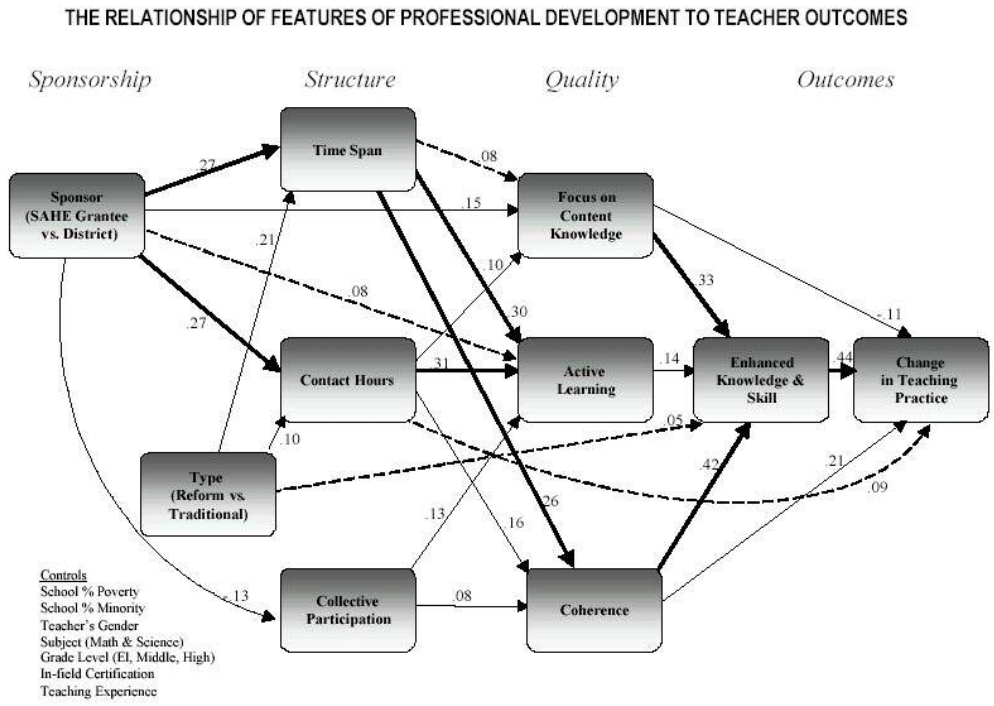
In an alternative approach, some educational thinkers describe teacher improvement through the lens of organizational management (Darling-Hammond, 1996; DuFour, 2004a; DuFour & Eaker, 1998; Hord, 1997; Lee et al., 1995; McLaughlin & Talbert, 1993; Rosenholtz, 1989). Within this model, the school environment and organizational strategies emphasized by school leaders are seen as both supporting and mediating changes in teacher skills, knowledge, and instructional behaviors. More specifically, DuFour (2004a) conceptualizes professional development as both an integral part and natural byproduct of comprehensive organizational strategies that stress individual and organizational commitment to common goals, collaborative work and decision-making, and an attention to organizational data and results. This section will explore the ways in which both professional development and organizational structure

can influence teacher effectiveness, identifying the professional development features and organizational strategies that research suggests are most likely to support improvements in teacher quality.

The Features of High-Quality Professional Development

The research evidence overwhelmingly suggests that professional development efforts can have a positive impact on teacher effectiveness (Cohen & Hill, 1998; Kennedy, 1998; Garet et al., 1999, 2002; Little, 1994; Stiles et al., 1996; Wenglinsky, 2000). Nevertheless, while the literature is replete with anecdotal articles and earnest exhortations concerning the best recipes for professional development, it is only recently that researchers have begun to focus on connecting professional development features in a quantitative way to the types of teacher attitudes and behaviors most likely to impact student achievement (Garet et al., 2001). For this reason, Garet et al.'s (1999) study represents a significant step forward in defining the features of high-quality professional development. The study spanned three years and focused on professional development programs throughout the country that had been funded through the Eisenhower Professional Development Program, part of Title II of the federal Elementary and Secondary Education Act. Using the literature base to identify candidate features of effective professional development, the authors then focused on those features that demonstrated a statistical correlation to teachers' self-reported changes in instructional practice. The statistical relationships identified by Garet et al. (1999, p. 3-53) are reproduced in Figure 3.

Figure 3: Garet et al.'s relationships of features of professional development to teacher outcomes (1999, p. 3-53)



Because Garet's features (1999) will be used as the theoretical lens in the proposed study, it will be helpful to provide a concise review of the literature supporting each of Garet's (1999) six identified features. As previously stated, Garet et al. (1999) identified three structural and three core features of high-quality professional development. In general, the structural features support or mediate the effectiveness of the core features, serving as the "wrapper" within which professional learning takes place. The core features comprise the "agenda" of training: the training curriculum, the nature of activities, etc. Garet's (1999) six features are:

- Structural features
    - Type of activity

    - Duration
    - Collective participation
- Core features
    - Focus on content
    - Promoting active learning
    - Fostering coherence

Structural feature: Type of activity

The type of activity refers to the form of the professional development; for example, whether the professional development is a traditional workshop or a reform model, such as a study group or peer mentoring relationship. Traditionally, teacher professional development has taken the form of isolated, one-time workshops or conferences, which have been consistently criticized in the literature as being ineffective and failing to meet teachers' professional needs (Ball, 1996; Darling-Hammond, 1996b; Garet et al. 2001; Little, 1994; Sparks, 1994). A variety of alternative, or reform-type professional development activities have become increasingly popular—examples include study groups, professional networks, mentoring relationships, and others (Loucks-Horsley et al., 2003)—and many researchers and experts have suggested that these reform-type activities may respond more effectively to teachers' needs (Ball, 1996) and demonstrate a greater propensity to lead to changes in teacher instructional behaviors (Darling-Hammond, 1996b; Loucks-Horsley et al., 2003; Stiles et al., 1996).

In analyses of the relationships between Garet's (1999) professional development features and changes in teacher instructional behaviors (Garet et al., 1999, 2001; U.S.

Department of Education, 2000), the effects of activity type were somewhat counter-intuitive, given the literature base. As is shown in Figure 3, the type of activity had a direct impact on the professional development time span and total number of contact hours, but no direct correlation with changes in teaching practice. That is, reform-type professional development tended to include more contact hours and occurred over a greater span of time than did traditional workshops, but the type of activity was not in-and-of-itself an influencing factor; traditional workshops of equivalent duration were as effective as reform-type activities (Garet et al., 2001, p. 935-936). This suggests that a focus on workshop format is less important that a focus on sustained, in-depth learning that addresses the "core" professional development features.

Structural feature: Duration

Professional development duration refers to both contact hours (i.e., total number of hours spent on a professional development topic) and span of time covered (i.e., whether the professional development occurred once or included multiple sessions extending over a lengthier period of time). The literature is highly consistent in suggesting that professional development with more contact time and a lengthier time span is likelier to lead to changes in teacher behaviors (Cohen & Hill, 1998; Little, 1994; Stiles et al., 1996; Wenglinsky, 2000). Analyses of the relationships between Garet's (1999) professional development features and changes in teacher instructional behaviors (Garet et al., 1999, 2001; U.S. Department of Education, 2000) suggest that contact hours and time span are independently important variables, with each measure of duration showing an independent, positive relationship to core professional development features,

including active learning, coherence, and a focus on content knowledge. According to Garet et al. (2001):

> Longer activities tend to include substantially more opportunities for active learning, such as the opportunity to plan for classroom implementation, observe and be observed teaching, review students' work, and give presentations and demonstrations. Longer activities also tend to promote coherence including connections to a teacher's goals and experiences, alignment with standards, and professional communication with other teachers. Time span and contact hours also have a moderately positive influence on the emphasis given to content knowledge" (p.933).

Structural feature: Collective participation

Collective participation refers to the grouping of participants in professional development by some common characteristic, such as grade level, discipline, or even school. While there is little direct research focusing on collective participation as an independent variable in professional development, there is much to suggest that common grouping practices are likely to support improved training results. For example, in a study of 24 schools going through a restructuring process across 18 different states, Newmann & Associates (1996) found that more successful schools utilized professional development that "tended to be focused on groups of teachers within the school or the faculty as a whole" (p.198). Ball (1996) suggests that teachers need opportunities to discuss and debate issues with other teachers in order to grow professionally, and

numerous professional development experts affirm the importance of collective participation (for example, DuFour, 2004; Hirsh, 2004; Loucks-Horsley et al., 2003).

Analyses of the relationships between Garet's (1999) professional development features and changes in teacher instructional behaviors (Garet et al., 1999, 2001; U.S. Department of Education, 2000) suggest that collective participation has a moderate positive relationship with coherence and active learning (both discussed in more detail below). That is, professional development activities that use common grouping practices are more likely to help teachers connect learning to previous knowledge, provide teachers with opportunities to discuss issues with colleagues, and provide opportunities for active engagement with new information (see Figure 3).

Core feature: Focus on content

A focus on content in professional development comprises two separate dimensions: first, an effort to enhance teachers' knowledge of particular content (e.g., knowledge of U.S. history); and second, an effort to enhance teachers' knowledge of effective instructional practices to teach specific content to students. Recent research has emphasized the importance of professional development that addresses specific content (e.g., using primary documents from World War II when working with high school U.S. History students), as opposed to professional development that focuses on generic teaching strategies outside of the context of a specific discipline (e.g., cooperative learning). According to Kennedy (1998), "[P]rograms that focus on subject matter knowledge and on student learning of particular subject matter are likely to have larger positive effects on student learning than are programs that focus mainly on teaching

behaviors" (p.9). Kennedy's assertion, based on an analysis of multiple studies linking professional development to student learning, is part of a growing emphasis throughout the professional development literature on the importance of content (for example, Cohen & Hill, 1998; Sparks, 1994; Stigler & Hiebert, 1999).

In analyses of the relationships between Garet's (1999) professional development features and changes in teacher instructional behaviors (Garet et al., 1999, 2001; U.S. Department of Education, 2000), a focus on content knowledge was found to have a positive relationship with both the enhancement of teachers' knowledge and skills and changes in teaching practice (see Figure 3). This makes intuitive sense: as teachers learn more about their subject and how to teach it—for example, studying primary documents from World War II and learning how to use them with students—they are more likely to change their teaching practices in line with their new knowledge and skills: in our example, they are then more likely to use primary documents when teaching about World War II. A particularly interesting finding concerning the relationship between content focus and changes in teaching behaviors was that, when a content focus did not lead to increased knowledge and skills (that is, teachers participated in professional development around their content area but did not learn anything new), there was a negative association with changes in teaching practice (Garet et al., 2001, p.934). This suggests that a content focus alone is not enough; professional development must also explicitly address *increasing* teachers' knowledge and skills within the content area.

Core feature: Promoting active learning

Promoting active learning includes four dimensions, all of which focus on opportunities for teachers to directly cognitively engage with new knowledge and skills. Those four dimensions are: 1) observing and being observed in the classroom; 2) planning classroom implementation (e.g., practicing under simulated conditions, discussing classroom implementation with colleagues); 3) reviewing student work; and 4) presenting, leading, and writing (e.g., giving a lecture or presentation, conducting a demonstration of a lesson). Given that teachers, like other learners, learn best when they construct knowledge over time, when they can relate new information to existing knowledge, and when learning is presented as an active process (Finley et. al., 2000; Bransford, Brown, and Cocking, 1999, as cited in Loucks-Horsley et. al., 2003), it makes intuitive sense that active learning opportunities would positively influence the acquisition of new knowledge and skills, given that they allow for richer and more powerful cognitive engagement. The research literature similarly supports the importance of active learning as an important component of effective professional development, stressing opportunities for teachers to engage directly in concrete tasks focused on the curricular and instructional components of teaching (Darling-Hammond and McLaughlin, 1996; Finley et. al., 2000; Garry & Graham, 2004; Loucks-Horsley et. al., 2003).

Active learning plays a role in enhancing teachers' knowledge and skills, according to analyses of the relationships between Garet's (1999) professional development features and changes in teacher instructional behaviors (Garet et al., 1999, 2001; U.S. Department of Education, 2000), but not as great a role as the other two core features (see Figure 3). In order for active learning to play a role in changing teachers'

practices, it seems that the active learning opportunities must first focus on increasing teachers' knowledge and skills, and only through those enhancements can active learning play a role in modifying instructional behaviors.

Core feature: Fostering coherence

"Coherence", as defined by Garet et al. (1999), includes three dimensions: first, connecting professional development with teacher and school goals and other professional activities; second, aligning training content and pedagogy emphasized in the training with state and district standards and assessments; and third, providing opportunities for professional communication among teachers engaged in similar efforts. Multiple studies and publications echo the importance of explicit connections between larger school goals and training goals (Darling-Hammond and McLaughlin, 1996; Laine, 2000; National Staff Development Council, 2001) and of opportunities to work and dialogue with colleagues around issues of teaching and learning (Darling-Hammond and McLaughlin, 1996; Finley et. al., 2000; Garry & Graham, 2004).

Analyses of the relationships between Garet's (1999) professional development features and changes in teacher instructional behaviors (Garet et al., 1999, 2001; U.S. Department of Education, 2000) suggest that "coherence" is perhaps the most important feature of professional development; coherent professional development programs have a strong positive relationship with enhancements of teachers' knowledge and skills and an independently positive relationship with changes in teaching practice (see Figure 3). Again, given that teachers, like other learners, learn best when they can relate new information to existing knowledge (Bransford, Brown, and Cocking, 1999, as cited in

Loucks-Horsley et. al., 2003; Finley et. al., 2000), it makes sense that training connected explicitly to teacher goals and curriculum, supported by opportunities to communicate with like-minded colleagues, would support professional growth.

The Features of Effective Organizational Management

The link between school management practices and teacher behavior described in the current literature (for example, Darling-Hammond, 1996a; Fullan, 2001; Hord, 1997; Lee et al., 1995; McLaughlin & Talbert, 1993; Rosenholtz, 1989) incorporates certain assumptions about organizational behavior: for example, relationships among school employees are complex and multi-faceted, cause and effect occur in a web of patterned circumstances, and intangibles such as employee "perceptions" or "levels of commitment" influence individual behaviors. These assumptions, however, have not always existed in the literature, but instead have evolved over time. To understand the current conception of "organizational behavior", and the way in which organizational management strategies are conceived to impact teacher development, it is important to begin with a brief history of the organizational management literature, especially as it relates to the professional learning community model.

One of the first pioneers of organizational theory was Frederick Taylor, whose "principles of scientific management" attempted to break down organizations and work roles into clearly definable and measurable sub-components. In an ideal organization, according to Taylor, each worker's job would be divided into a series of small, related tasks upon which the worker could be trained and that could be easily measured and managed by a managerial layer of executives. These executives would then be

responsible for goal setting, planning, supervising, and establishing and revising worker objectives based on organizational goals and scientifically measured job performance. (Owens, 2001, p.35-41) Classical organization theory moved from a focus on the individual worker to a focus on the total organization. According to Owens (2001), "Classical organization theorists have sought to identify and describe some set of fixed 'principles' (in the sense of 'rules') that would establish the basis for management" (p.41). Classical organization theory describes organizations through the use of hierarchical models of authority and responsibility, and its "organization charts" and principle of "unity of command" (which addresses the idea that no person in an organization should receive orders from more than one superordinate) are still widely used in schools and school districts. (Owens, 2001, p.39-43)

Other, more recent educational theorists have posited a more complex, more nuanced relationship among workers within organizations. In "Educational Organizations as Loosely Coupled Systems", Karl Weick (1976) applies the concept of organizational coupling to schools and school systems. In brief, the idea of coupling explains that the extent of connection between individuals and sub-groups within an organization will vary—a model that complicates and contradicts Frederick Taylor's picture of direct manager-worker, directive-response relationships. For example, within a school, a principal and an assistant principal could be considered tightly coupled, in that the assistant principal reports directly to the principal, the two individuals work closely with each other, and the principal's directives will most likely have a considerable impact on the assistant principal's behaviors and job performance. In contrast, a principal and an individual classroom teacher might be loosely coupled, in that the principal may spend

very little time with an individual classroom teacher in his or her classroom, the principal may have very little knowledge of the teacher's day-to-day job performance, and the principal's directives may have only a slight impact on the individual teacher's classroom behavior. Whereas in the models of scientific management and classical organization theory, where managerial instructions directly determine or influence workers' behaviors, Weick's (1976) concept of loosely coupled systems suggests that, especially in schools and school systems, a manager's directives may have only a marginal impact on workers' behaviors.

Another organizational theorist who had a profound impact on both the business and education worlds is W. Edwards Deming. Deming's theory of Total Quality Management (TQM) took aspects of Taylor's "scientific management," along with classical organizational behavior theories, and transformed them into a new story of organizational change. While TQM shares scientific management's focus on efficiency and data-driven decision-making (i.e., collecting and analyzing data on individual and organizational performance to target improvements and maximize efficiency), Deming's theories emphasize organizational *transformation* as opposed to scientific management's focus on less complex incremental and adaptive improvements within a stable structure. Deming's TQM laid the groundwork for a deeper appreciation of the complex and inter-related web of factors influencing organizational behavior and performance, including factors such as managerial responsibility (i.e., managers taking responsibility for outcomes at the "worker" level); a reduced focus on post-hoc testing (based on the notion that post hoc tests come too late in the process to have an effect, and that you cannot "inspect in" quality); intrinsic versus extrinsic employee motivation (Deming emphasized

the importance of the former); an emphasis on organizational problem-solving; and the concept of continuous improvement (Deming emphasized the process of improving an organization incrementally as opposed to the search for bold and system-shattering innovations). (Owens, 2001, p.215-223)

Within the educational arena, more recent researchers like Rosenholtz, McLaughlin, Newmann, and Darling-Hammond have examined the importance and impact of workplace factors, institutional support for individual professionals, opportunities for collaborative inquiry, and the process of shared decision-making as they relate to organizational performance (Darling-Hammond, 1996a; McLaughlin & Talbert, 1993; Newmann & Associates, 1996; Rosenholtz, 1989). Peter Senge's description of schools as "learning organizations" was an attempt to marry many of these various factors into a cohesive theory of organizational behavior. According to Senge, a learning organization means "developing a clear and honest understanding of current reality that is accessible to the whole organization, is used to produce new, equally accessible knowledge, and that helps people take effective action toward their desired future" (Senge et al., 2000, p.552). Senge's theory of learning organizations emphasizes individual empowerment and improvement, shared goal setting, collaboration, and the concept of "systems thinking" (Senge, 1990), which is in turn related to "living systems theory".

"Living systems theory" is a model of organizational change and behavior that attempts to explain the complexity of organizations through the metaphor of a living system. As described by Wheatley (1999), within a given system:

> Each organism maintains a clear sense of its individual identity within a larger network of relationships that helps shape its identity. Each being is noticeable as a separate entity, yet it is simultaneously part of the whole system. While we humans observe and count separate selves, and pay a great deal of attention to the differences that seem to divide us, in fact we survive only as we learn how to participate in a web of relationships. (p. 20)

Living systems theory stands in direct contrast to the organizational theory of scientific management and classical organization theory. Baird-Wilkerson (2003) contrasts classical organizational theory with living systems theory in the following way:

> An integrated living-systems view of change is different from the commonly accepted Newtonian, or mechanistic, view of change. The mechanistic paradigm espouses that organizations run well if they operate like a machine, separated into narrow processes that are linked together. The mechanistic perspective posits that preservation of an organization is preservation of its current form — therefore leaders manage the parts so that the machine continues to function predictably… From a living-systems view of change, organizations are systems that self-organize, create, think, adapt, and seek meaning. If the organization violates any of these imperatives, the system will fail. The key then for change work is facilitating a process and building organizational capacity to honor these imperatives. By doing so, the organization is able to learn from itself and create appropriate and relevant change efforts based on new knowledge;

> hence, it is self-organizing and functions as a learning organization. (p.6-9)

To understand the impact that organizational structure can have on teacher quality, therefore, it is important to recognize that the organization-individual relationship is a complex one. According to Pascale et al. (2000), "Living systems cannot be *directed* along a linear path. Unforeseen consequences are inevitable. The challenge is to *disturb* them in a manner that approximates the desired outcome." (p.6, emphasis in original) Nevertheless, organizational context matters. In a summary of five years of research conducted at the Center for Research on the Context of Secondary School Teaching, McLaghlin and Talbert (1993) noted that "teachers' responses to today's students and notions of good teaching practices are heavily *mediated by the character of the professional communities* in which they work" (p.8, emphasis in original). In an evaluation of high school restructuring efforts, Lee et al. (1995) found that schools organized under an "organic" model (which includes certain structural elements, such as reduced hierarchy and increased collaboration) experienced higher achievement rates and smaller achievement gaps than more traditionally structured schools. According to Lee et al. (1995):

> Schools that demonstrate a higher level of social organization post greater and more equitable gains in student achievement in math and science…In schools where most teachers feel they can make a real difference in the academic performance of students—instead of blaming low performance on students' attitudes, background and other factors beyond teachers' control—students learn more and learning is more equitably distributed. In

schools organized under a more organic model, teachers are more likely to assume this responsibility. The organic model also provides more opportunity for teachers, working together, to examine and adapt their practices to reflect student needs. (p.8)

In commenting on Lee et al.'s (1995) work, Rowan (1995) noted that, "It is not structural change per se that creates successful schools. Instead, structural changes succeed in improving school performance only if they are consistent with, and support changes in, work practices (e.g., authentic instruction), and only if they are undertaken by a committed work force of teachers." (p.15) In other words, organizational management strategies, like those identified by Lee et al. (1995), are effective only insofar as they can impact the curricular and instructional decisions made by teachers in their classrooms. It is specifically these types of changes in "work practices" that the professional learning community organizational model attempts to influence.

The Professional Learning Community Model of Organizational Management

The PLC concept can in many ways be seen as an organizational explanation that addresses the dilemma of the loosely coupled nature of schools while recognizing the complexity of organizations, as described by living systems theory. In defining the PLC concept, DuFour and Eaker (1998) identify six essential characteristics:

1. Shared mission, vision, and values
2. Collective inquiry
3. Collaborative teams
4. Action orientation and experimentation

5. Continuous improvement
6. A results orientation

Through the lens of Karl Weick's theory of loosely coupled systems (Weick, 1976), these six characteristics can be seen as attempts to tighten what living systems theory suggests is a highly complex and dynamic structure, while simultaneously supporting improvements in teaching efficacy. That is, the process of creating a shared mission, increasing intra-organizational communication and collaboration, discussing and identifying targets for improvement, setting goals, and collecting and analyzing results both A) necessitates the development and usage of a common language and set of organizational parameters, and B) requires frequent and ongoing discussion and reflection about instructional practice among the teaching staff. In theory, these efforts in turn lead to classroom curricula and instruction that are more tightly coupled, and the efforts required to achieve that coupling support improvements in teaching practice.

Since identifying the six components that he believed defined a Professional Learning Community, Rick DuFour has reduced those characteristics to the three "big ideas" that he finds most important: ensuring student learning, developing professional collaboration, and focusing on results (DuFour, 2004b). Each of these characteristics builds on previous theories:

- **Ensuring student learning**—By agreeing to ensure student learning, a school staff creates a system of common understanding, common goals, and common language, thus reducing the loose nature of the organization. Much of the impetus for this characteristic can be found in Senge's theories of the learning

organization (Senge, 1990, 2000) and Fullan's emphasis on moral leadership (Fullan, 1999, 2001).

- **Developing professional collaboration**—Through professional collaboration, a system connects individual members in ways more likely to lead to mutually agreed-upon and consistently implemented decisions, thus connecting disparate parts of the organization. This characteristic is strongly informed by Senge's work on learning organizations (Senge, 1990, 2000) and educational research from scholars such as McLaughlin and Darling-Hammond (Darling Hammond, 1996a; McLaughlin, 1993).
- **Focusing on results**—The process of identifying, analyzing, and addressing agreed-upon student and school data reinforces a common vision and vocabulary, connects curricula and instruction across classrooms, reinforces organizational norms, and aligns leadership and staff. A focus on results is highly reminiscent of the continuous improvement tenets of TQM, which are in turn reminiscent of the data-driven approach of Taylor's scientific management.

Other PLC theorists have identified similar characteristics that, while they may differ in verbiage or emphasis, share common themes. For example, according to Hord (1997b), the five attributes of a PLC are:

1. Supportive and shared leadership
2. Collective creativity
3. Shared values and vision
4. Supportive conditions
5. Shared personal practice

As in DuFour's list, these characteristics address structural strategies to tighten the alignment of organizational systems and support teaching improvement. "Supportive and shared leadership" suggests that leadership decision-making is not centralized in a single individual or administrative team, but rather distributed to multiple individuals and teams throughout the school. Again, the greater the number of members of a system who are involved in leadership and decision-making, the greater the chance that the larger system will cohere and eliminate distances and barriers between groups. "Shared personal practice", the idea that teachers are sharing instructional strategies, further reduces the isolation of disparate elements of the system and supports improvements in instructional efficacy.

In identifying the characteristics of a PLC, Hord (1997a) also identified the research supporting the efficacy of her five characteristics. As part of her literature review, Hord identified staff and student outcomes associated with the formation of professional learning communities. For staff, a sample of these outcomes included:

- "Increased commitment to the mission and goals of the school and increased vigor in working to strengthen the mission
- Increased meaning and understanding of the content that teachers teach and the roles they play in helping all students achieve expectations
- Higher likelihood that teachers will be well informed, professionally renewed, and inspired to inspire students
- More satisfaction, higher morale, and lower rates of absenteeism
- Higher likelihood of undertaking fundamental systemic change" (p. 27).

For students, a sample of the results included:

- "Decreased dropout rate and fewer classes 'skipped'
- Lower rates of absenteeism
- Greater academic gains in math, science, history, and reading than in traditional schools
- Smaller achievement gaps between students from different backgrounds" (p. 28).

The Connection Between PLC Principles and Professional Development

Conceptually, the professional learning community model seems to encourage activities that exhibit many of Garet et al.'s (1999) features of high-quality professional development. Figure 4 identifies activities that DuFour (2004b) associates with participation in a professional learning community and relates those activities to corresponding features of high-quality professional development (Garet et al., 1999). Nevertheless, while professional learning community activities are conceptually related to features of high-quality professional development and teacher improvement, there has been little research to date explicitly exploring this relationship in detail. Furthermore, research around the professional learning community model is either theoretical or focuses on aggregate outcomes across multiple test sites.

Figure 4: DuFour's (2004b) professional learning community activities and their relationship to Garet's (1999) features of high-quality professional development

Garet's (1999) features of high-quality professional development	*Activities associated with participation in a professional learning community (DuFour, 2004b)*
Type of activity	• Reform-type strategies focusing on collaborative conversations
Duration	• Ongoing teacher conversations of significant duration
Collective participation	• Teachers work in school- and grade-level teams
Focus on content	• Teachers work collaboratively to identify essential curriculum for students
Promoting active learning	• Collective identification of struggling students • Teachers work collaboratively to identify essential curriculum for students, create common assessments, create assessment criteria, and share instructional strategies • Teachers collect, analyze, and discuss formative and summative student assessment data
Fostering coherence	• Collective identification of struggling students • Teachers work collaboratively to identify essential curriculum for students, and teachers observe each other teaching • Teachers collect, analyze, and discuss formative and summative student assessment data

The Need for Local Research

Because of the complex nature of schools, school leaders must understand the specific mechanisms and nuances underlying the professional learning community model in order to be able to use it as an effective tool in school improvement. Broad generalizations and correlations are of limited practical use at the individual school site. This study attempted to provide a richer, more detailed, and more specific description of the ways in which the professional learning community model relates to teacher growth and improvement at the school site level. For the school leader wishing to identify and

understand specific organizational strategies to drive student success, it is hoped that this study will provide an opportunity to understand organizational strategies that might support teacher improvement and student achievement.

Chapter 3

This chapter outlines the research design and methods used in the study, and it includes the results of the test site selection process. It begins with a summary of the research purpose and theoretical lens. After reviewing the results of the site selection process, it then identifies the subjects, research design, and instrumentation, focusing in detail on the survey instrument and interview questionnaire.

Research Purpose and Theoretical Lens

School-based efforts to improve teacher quality could pay real dividends in terms of student learning, especially when those efforts attend to classroom curricular and instructional practices. Teacher improvement efforts have traditionally manifested themselves under the formal designation of *professional development*, which typically comes in the form of school-, district-, or conference-based workshops; research suggests, however, that effective and consistent professional development programs, especially school-based programs, are few and far between (Ball, 1996; Darling-Hammond, 1996; Garet et al. 2001; Little, 1994; Sparks, 1994; U.S. Department of Education, 2000). Rick DuFour approaches the subject of teacher improvement from a different perspective, arguing that, "the best staff development happens in the workplace rather than in a workshop" (DuFour, 2004a, p.63). DuFour asserts that, by employing professional learning community principles and strategies throughout an organization, a school leader can effect teacher improvement. While research does suggest a correlation between certain organizational management strategies and educational outcomes, such as

teacher behaviors and student learning (Darling-Hammond, 1996; Hord, 1997; Little et al., 1994; McLaughlin & Talbert, 1993; Rosenholtz, 1989), there is little research exploring DuFour's claim (2004a) that professional learning community principles connect directly to teacher improvement.

The professional development literature does, however, provide a specific language and framework to describe any potential connections, particularly the research of Garet et al. (1999). Garet's (1999) study spanned three years and focused on professional development programs throughout the country that had been funded through the Eisenhower Professional Development Program, part of Title II of the federal Elementary and Secondary Education Act. Using the literature base to identify candidate features of effective professional development, the authors focused on those features that demonstrated a statistically significant relationship to teachers' self-reported changes in instructional practice. In defining high-quality professional development, this proposal relies on those characteristics identified by Garet et al. (1999), which included six structural and core professional development features:

- Structural features
    - Type of activity
    - Duration
    - Collective participation
- Core features
    - Focus on content
    - Promoting active learning
    - Fostering coherence

Professional development features therefore provide a possible lens to explore and explicate the complex nature of the relationship between professional learning community strategies and any changes in teacher knowledge and behaviors. The theoretical model depicted in Appendix A provides a graphical representation of this framework. This study attempted to explore that relationship as it exists in practice in a school actively organized around professional learning community principles. It is hoped that the results of this study will provide school leaders with a more complete, situated understanding of DuFour's (2004b) professional learning community model as it relates to teacher improvement. Therefore, using a theoretical model developed from recent research on organizational behavior and professional development (see Appendix A), the purpose of this concurrent triangulation, mixed method case study was to explore the relationship between professional learning community activities and teacher improvement for core middle school teachers in a first year school designed around DuFour's (2004b) professional learning community principles. Specifically, the study addressed the following three research questions:

1. Which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and pedagogical knowledge and skills and with changes in teachers' instructional practices for core academic middle school teachers in a first year school?
2. Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics—including years of teaching experience (divided into the three categories

reported by North Carolina schools: 0-3 years, 4-10 years, and 10+ years), grade level taught, and subject taught— for core academic middle school teachers in a first year school?

3. In what ways do organizational and personnel factors—specifically, intra-organizational social dynamics, the personality and leadership style of the principal, structured planning time, and use of a block schedule—influence the teacher improvement efficacy of professional learning community activities for core academic middle school teachers in a first year school?

Selection of Central Middle School As the Research Site

The first stage of the study involved the selection of an appropriate test site, i.e., a first-year "professional learning community" middle school modeled after DuFour's (2004b) description of a PLC. After identifying a site that appeared to meet the research criteria—a first-year middle school, Central Middle, in which the researcher had worked as an administrative intern—the study continued with an analysis of teacher interview data and school documents to determine the fidelity of application of DuFour's (2004b) professional learning community principles. Using a designated protocol, school practices were compared against DuFour's (2004b) definition and description of a professional learning community (the protocol is presented in Appendix B).

Central Middle School was ultimately chosen as the test site for this research study because of its high level of fidelity to DuFour's (2004b) professional learning community principles. This section provides some basic demographic information about Central Middle, documents the extent to which Central Middle demonstrated fidelity to

each of the three "big ideas" that undergird DuFour's (2004b) definition of a professional learning community, and provides a final summary of Central Middle's overall fidelity to professional learning community principles.

Demographic Data

In 2004-05, Central Middle School was a first-year school serving 6th through 8th grade students in a large, semi-urban district in the Southeast. In the 2004-05 school year, Central Middle had 662 students and 44 classroom teachers, 24 of whom were considered core academic teachers. Central Middle's student population was relatively homogenous: according to state testing data, 79.6% of Central's students were White, with Blacks representing the next largest racial group at 7.8%, followed by Asian/Pacific Islanders at 6.8%, Multi-Racial students at 3.8%, and Hispanics at 2.1%. Students with disabilities comprised 15.6% of the student population, and 7.7% of the student population qualified as economically disadvantaged. In terms of Central's teaching staff, Table 1 presents general demographic information for Central Middle's teachers as compared to other schools in the same district and state.

Table 1: 2004-05 demographic information for Central Middle's teachers

	Total # of Classroom Teachers	Fully Licensed Teachers	Teachers with Advanced Degrees	Years of Teaching Experience		
				0-3 years	4-10 years	10+ years
Central Middle	44	93%	40%	24%	38%	38%
District	63	89%	27%	21%	31%	47%
State	45	84%	24%	26%	28%	47%

Central Middle's schedule was broken into four 90-minute teaching blocks. Each day, students typically received 90 minutes of language arts instruction, 90 minutes of math instruction, 45 minutes of Science, 45 minutes of Social Studies, and 90 minutes of electives (e.g., Physical Education, Band, Technology, Art). At each grade level, teachers were organized into a variety of teams. At the 6th grade, each teacher taught two subjects—either Language Arts and Social Studies or Math and Science—and teachers were paired into two-person teams that shared common students, such that a Language Arts/Social Studies teacher would share roughly 50 students in common with a Math/Science teacher. At the 7th and 8th grades, teachers typically taught only one subject (Language Arts, Math, Science, or Social Studies), and teachers were organized into three- or four-person teams sharing common students. All of the core academic teachers were organized into multiple professional learning community teams, which met on a regular basis. The most common teams were same-grade, same-subject teams, but teachers also met regularly as whole grade levels, as same-student teams (i.e., teachers who shared common students), across grade levels by discipline, and as a whole faculty.

One important facet of Central Middle concerned its development prior to opening. The principal for Central was hired in early 2005 and was given approximately six months to work full-time to manage the development of the school prior to its opening in August. The principal was also able to hire the entire faculty from scratch. Interview and document data revealed that the principal was interested in developing a professional learning community along DuFour's (2004b) model from the first day he was hired, and his personnel decisions were influenced by his desire to hire educators interested in and committed to PLC principles, especially collaboration. Therefore,

Central Middle was initially envisioned as a professional learning community and the principal was able to plan and hire based on that vision. As the data revealed, this vision on the part of the principal, and the opportunity to build a school from scratch around that vision, led to a high degree of fidelity to DuFour's (2004b) PLC principles.

Fidelity to Professional Learning Community Principles

In order to determine the degree of Central Middle's fidelity to DuFour's (2004b) professional learning community principles, two types of data were collected: school documents and teacher interviews. During November and December of 2005, a variety of school documents were collected, including Central Middle's School Improvement Plan, notes from whole-faculty and grade-level meetings, blank student assessment documents, internal staff surveys, lesson plans, curriculum maps, and Web site pages. During the same two months, data was collected from eight teacher interviews, including teachers from various grade levels, subject areas, and with various years of experience. The demographic information of interviewed teachers is summarized in Table 2.

Table 2: Teacher interviewees broken down by grade level, subject area, and years of teaching experience

6th grade	**7th grade**	**8th grade**
4 interviewees	2 interviewees	2 interviewees

Math	**Language Arts**
4 interviewees	4 interviewees

0-3 years teaching experience	**4-10 years teaching experience**	**10+ years teaching experience**
2 interviewees	4 interviewees	2 interviewees

Following the data collection stage, the data was analyzed using the protocol described in Appendix B. From that analysis, it was determined that Central Middle did meet DuFour's (2004b) definition of a functioning professional learning community. While fidelity to DuFour's (2004b) three "big ideas" was determined to be high in general, there were variations across grade levels, and overall degree of fidelity did vary across the three "big ideas". The remainder of this section summarizes the extent to which Central Middle demonstrated fidelity to each of DuFour's (2004b) "big ideas": ensuring student learning, developing a culture of professional collaboration, and focusing on results (p.6).

Big idea #1: Ensuring that students learn

The first of DuFour's (2004b) big ideas focuses on the extent to which a school commits itself to ensuring that students learn and institutionalizes specific practices to realize that commitment. According to DuFour (2004b), the following principles and practices are components of this big idea:

- Ongoing individual and organizational reflection on best practices for student achievement
- Collaborative identification of expected learning standards
- Collaborative creation of assessments tied directly to learning standards
- When students demonstrate a lack of proficiency relative to identified learning standards, individual and organizational response is timely, based on intervention rather than remediation, and directive

As identified in Appendix B, the following are examples of anticipated behaviors or artifacts that would suggest organizational fidelity to those principles and practices:

- Regular (i.e., weekly or monthly) discussions of curricular objectives and effective instructional practices at faculty sub-group and whole-group meetings
- Curriculum maps or written curriculum sequences
- Formal written student intervention plans
- Regular faculty sub-group discussions of student academic progress
- Documentation of under-performing students and subsequent academic interventions
- Common assessments

Teacher interview and school document data suggested a high degree of fidelity to this big idea. Core academic teachers at Central Middle met in grade-level, subject-specific teams on at least a weekly basis throughout the school, and these meetings regularly included discussions of curricular objectives and instructional practices. The school schedule was created to facilitate these meetings and to allow common meeting times, and meetings typically lasted anywhere from 30 to 90 minutes. Over the course of the academic year, grade-level teams developed quarterly curriculum maps, which detailed the specific curricular objectives that would be taught and assessed each quarter, and 6th and 7th grade teams went so far as to collaboratively plan weekly classroom activities, such that instruction was highly aligned across teachers from classroom to classroom. The school developed a formal academic intervention plan for students, which detailed various classroom- and grade-level interventions that should be implemented and

documented for struggling students. The school also implemented a Student Support Team, a collaborative, school-level group of teachers and support staff that met weekly to plan interventions for struggling students. Finally, each same-grade, same-subject professional learning community team was required to create quarterly common assessments, and each grade level went beyond this requirement to implement common assessments on a monthly or even weekly basis.

Although fidelity to this big idea was high throughout the school, there were some variations across grade levels. The depth of discussions concerning curriculum, instruction, assessment, and student progress appeared to be most substantive at the 6th and 7th grade levels and less substantive at the 8th grade level. It is important to note that 6th and 7th grade professional learning community teams had greater numbers of teachers than did 8th grade teams; in fact, there was only one 8th grade Social Studies teacher and one 8th grade Science teacher, meaning that each of these individuals had no one with whom to collaborate on grade level concerning curricular, instructional, and assessment issues. Nevertheless, data from internal surveys conducted in the first half of the year suggested that teachers schoolwide exhibited a high level of fidelity to Central Middle's mission, which explicitly stated a commitment to "ensuring student learning".

Big idea #2: A culture of collaboration

The second of DuFour's (2004b) big ideas focuses on the extent to which a school creates and institutionalizes regular and purposeful collaboration amongst teachers. According to DuFour (2004b), the following principles and practices are components of this big idea:

- Regular team-based collaboration focused on analysis and improvement of classroom practices and student learning
- Universal staff membership on teams focused on student learning
- Structured time during the school day for team meetings
- Clear norms and protocols concerning roles, responsibilities, and relationships among team members
- Regular collaborative conversation focused not just on issues of teaching but also on issues of student learning

As identified in Appendix B, the following are examples of anticipated behaviors or artifacts that would suggest organizational fidelity to those principles and practices:

- Lists of essential academic outcomes
- Teacher teams organized by grade level and/or subject areas
- Regular (i.e., weekly or monthly) team-based meetings focused on the development of curriculum and assessments
- Regular (i.e., weekly or monthly) team-based meetings focused on effective instructional practices and student mastery of curriculum standards
- Common assessments
- Formal lists of team norms, protocols, and responsibilities

Teacher interview and school document data suggested a high degree of fidelity to this second big idea; in fact, the goal and practice of collaboration was the most consistent recurring theme throughout the interviews and documents. Central Middle's teachers collaborated at the grade level around the development of quarterly curriculum maps, which detailed the specific curricular objectives that would be taught and assessed

each quarter. Teachers were organized into multiple professional learning community teams, which met on a regular basis. Same-subject, same-grade teams (e.g., 6th grade Language Arts teachers) met the most frequently, usually at least once per week, while whole grade levels and whole subject areas also met at least monthly. The school schedule was designed to facilitate grade-level meetings, which occurred during the school day for both whole grades and sub-groups within grades, while subject area and whole-school meetings occurred after school. The substance of these meetings varied, with whole-grade level meetings typically focusing on administrative concerns and grade-level sub-group meetings (e.g., 6th grade Language Arts teachers) focusing primarily on curricular and instructional issues. The development of common assessments was one clear outcome of these meetings—common assessments existed across all subject areas within grade levels. Finally, while formal lists of team norms, protocols, and responsibilities existed, these varied by team, and it appeared that many of the teams struggled with the development of and adherence to these practices.

Again, grade-level variations did exist despite the high degree of schoolwide fidelity to this big idea. The depth of collaboration appears to have been greater at the 6th and 7th grade levels than it was at the 8th grade level. It also interesting to note a comment made by a 7th grade teacher concerning the focus on student learning in professional learning community discussions: “I think people have the intention of focusing on student learning, but really they focus on how they teach”. This comment highlights areas in which Central Middle failed to demonstrate fidelity to the third big idea, and it is a point that is dealt with in more detail later in this chapter and in Chapter 5.

Big Idea #3: A Focus on Results

The third of DuFour's (2004b) big ideas focuses on the ways in which a school collects, analyzes, and presents school and student data. According to DuFour (2004b), the following principles and practices are components of this big idea:

- Development of common formative assessments across teacher teams
- Regular and ongoing analysis of student performance data
- Clear goals for student learning and regular comparison of student performance data against learning goals
- Use of student assessment data to drive collaborative conversations focused on student learning and best practices
- Universal access to team ideas, materials, strategies, and talents

As identified in Appendix B, the following are examples of anticipated behaviors or artifacts that would suggest organizational fidelity to those principles and practices:

- Lists of essential academic outcomes
- Common assessments
- Regular (i.e., weekly or monthly) team-based meetings focused on analysis of student performance data
- Regular (i.e., weekly or monthly) team-based meetings focused on effective instructional practices and student mastery of curriculum standards
- Regular faculty sub-group discussions of student academic progress
- Focus on inclusion of all group members in both faculty conversations and whole-group or sub-group meetings

Teacher interview and school document data suggested a mixed level of fidelity to this big idea. Central Middle's teachers collaborated at the grade level around the development of quarterly curriculum maps, which detailed the specific curricular objectives that would be taught and assessed each quarter. Teachers also developed common assessments within grade levels and subject areas, and these assessments were administered at least quarterly, and oftentimes monthly or weekly. While there was evidence that teachers individually analyzed student performance data and reflected on student academic progress, it appeared that there was limited collaborative effort around student data analysis. For the most part, teacher discussions and collaboration tended to focus around educational inputs—in other words, curricular and instructional practices—and less on student learning outputs. There was some evidence that collaborative discussions focused on student learning data were becoming more prevalent by the end of the year, especially at the 6th and 7th grade levels, but these discussions were not occurring on a regular basis. In terms of inclusion of group members in faculty conversations and meetings, the evidence suggested a high level of inclusiveness, with attempts to use online document posting and discussion boards, in addition to face-to-face conversations, as a means of ensuring that all teachers had access to information and collaborative opportunities.

As discussed previously, 6th and 7th grade teachers appeared to have more substantive conversations around instructional practices than did 8th grade teachers, and the nascent practice of student data analysis was more evident at the 6th and 7th grades than at the 8th grade. However, the lack of a systematic, collaborative focus on student learning outcomes was a trend that existed across all three grades.

Summary

According to the criteria identified by DuFour (2004b) and the protocol established in Appendix B, Central Middle was a functioning professional learning community at the time of this study. Central's schedule was constructed to accommodate the collaboration necessary for development of a PLC, and documents and teacher interviews corroborated the fact that teachers met and collaborated on a regular basis to discuss and make decisions about curriculum, instruction, assessment, and student interventions. Teachers at Central created quarterly curriculum maps to identify taught and assessed objectives throughout grade levels, they used common assessments on a regular basis across classrooms, they discussed instructional strategies and student interventions at weekly and monthly meetings, and they spoke of an underlying foundation of commitment to student learning and a collaborative culture. While Central Middle was still in a nascent stage in terms of analyzing student assessment data in collaborative teams, and grade levels varied in terms of their implementation of PLC practices, the core principles of a professional learning community were clearly in place.

Research Design and Population

The purpose of the study was to explore and attempt to describe a specific phenomenon within a bounded system, i.e., teacher improvement as a function of professional learning community activities within a school adopting DuFour's (2004b) model of a PLC. Case study methodology is an appropriate and preferable method for

this type of research; according to Merriam (1998), "By concentrating on a single phenomenon or entity (the case), the researcher aims to uncover the interaction of significant factors characteristic of the phenomenon" (p.29). In addition, the researcher believed that it was likely that the relationship between professional learning community activities and teacher improvement would be contextual, occurring within a web of factors. Given this presumed complexity, a case study approach seemed sensible: according to Yin (2003), "The case study is the method of choice when the phenomenon under study is not readily distinguishable from its context" (p.4). By using a case study methodology, it was hoped that the complexity of the studied relationship between professional learning community activities and teacher improvement within a school context could be more fully explained and understood.

Miles and Huberman (1994) describe a case as "a phenomenon of some sort occurring in a bounded context" (p.25), while Stake (1995) describes it as "a specific, a complex, functioning thing" (p.2). Merriam (1998) identifies three features of a case study: a case study should be particularistic, descriptive, and heuristic. This study attempted to incorporate each of these three features. The study design was particularistic, in that it attempted to "focus on a particular situation, event, program, or phenomenon" (Merriam, 1998, p.29). The study was also intended to be descriptive, with an intended "end product…[that] is a rich, 'thick' description of the phenomenon under study" (Merriam, 1998, p.29). By using a mixed method design, the study aimed to provide a final interpretive description that would be both broad (i.e., extending across many members of the organization) and also deep (i.e., going into detail at the individual and sub-group levels). Finally, this study was heuristic, with a specific intent to

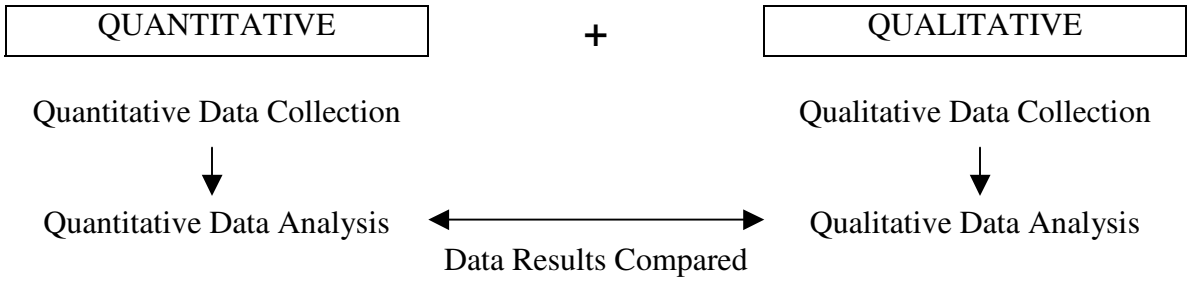
"illuminate the reader's understanding of the phenomenon under study" (Merriam, 1998, p.30) while also attempting to "bring about the discovery of new meaning [and] extend the reader's experience" (Merriam, 1998, p.30).

After the selection of an appropriate test site, three sets of data were gathered to address the research question. First, in an attempt to identify the relationship between professional learning community activities and teacher improvement, 6th, 7th, and 8th grade core teachers at the test site were asked to complete Garet et al.'s (1999) professional development survey concerning the professional learning community activities in which they had participated. These results were then used to: A) identify the features of professional learning community activities, if any, that demonstrated a significant relationship with changes in teachers' content knowledge and instructional practices; and B) identify any variation in the features of professional learning community activities, along with changes in teachers' content knowledge and instructional practices, based on years of teaching experience, grade level taught, and subject taught. Second, a purposefully selected group of teachers from the same school participated in one-on-one interviews focusing on the inter-relationship of professional learning community activities, professional development features, teacher and school characteristics, improvements in individual teachers' content knowledge, and individual teacher instructional behavior changes. These interviews were conducted by both the principal researcher and a secondary researcher. Finally, school documents were analyzed to further explore the relationships described above.

The study used a concurrent triangulation approach, which uses two complementary research methods to confirm, cross-validate, or corroborate findings

within one study (Creswell, 2003; Greene et al., 1989). According to Greene et al. (1989), "[W]hen two or more methods that have offsetting biases are used to assess a given phenomenon, and the results of these methods converge or corroborate one another, then the validity of inquiry findings is enhanced" (p.256). Data from the surveys were collected concurrently but separately from interview and document data, and the results were compared during the data analysis and interpretation stages (see Figure 5). Because of the interpretive and descriptive nature of the study, coupled with the intent to identify schoolwide relationships, a mixed-methods approach was preferable to a single methodology. The use of survey data from core teachers and document data from across the school allowed for the identification of generalizeable trends across the organization (i.e., broad relationships that were true at aggregate organizational and sub-group levels), while interview data allowed for the identification of individual experiences within the larger organizational context. In this way, the research question was addressed at both the macro (i.e., organizational) and micro (i.e., individual) levels, allowing a final picture that is both valid in its interpretations and rich in its descriptions.

Figure 5: Concurrent Triangulation research design (Creswell, 2003, p.214)



Data Collection Techniques

As stated previously, the study relied on both quantitative and qualitative data sources: specifically, a professional development survey, teacher interviews, and school documents.

Quantitative Data Collection and Instrumentation

For the quantitative aspect of the study, every 6th, 7th, and 8th grade Language Arts, Math, Science, and Social Studies teacher at the test site was asked to complete a survey after completing a full year of participation in professional learning community activities (please see Appendix C for a copy of the survey). The survey content and data analysis protocol were taken directly from the Teacher Activity Survey used by Garet et al. (1999) as part of their national evaluation of the Eisenhower Professional Development Program. Survey questions addressed self-reports of teacher experiences and behavior, and the survey was initially distributed to teachers drawn from a national sample that included 93% of all districts in the country (Desimone et al., 2002, p.83). According to Garet et al. (1999):

> In the spring, summer, and fall of 1998, we surveyed a nationally representative sample of teachers who had attended Eisenhower-assisted activities over the period from July 1 through December 31, 1997. We carried out the survey by drawing a national probability sample of districts and SAHE [state agencies for higher education] grantees… For each district and SAHE grantees drawn into the sample, we collected a complete list of all professional development activities conducted with

> Eisenhower funds over the period from July through December, 1997. We then drew a sample of two activities in each district or SAHE grantee, with the probability of an activity being selected in proportion to the number of teachers attending the activity. We then randomly sub-sampled two teachers who attended each activity. We received responses from 1,027 teachers, representing activities supported by Eisenhower funds in 358 districts and SAHE grantees. This produced an overall teacher response rate of 72 percent. (p.3-6)

Use of Garet et al.'s (1999) Teacher Activity Survey provided an effective means of addressing the research questions for a variety of reasons. First, the Survey's validity and reliability had already been measured in a national study. In terms of reliability, the original researchers used Cronbach's alpha to measure internal consistency (reliability scores for Garet et al.'s (1999) professional development features and outcomes are included in Figure 6). In terms of validity, according to one of the study's researchers, Kwang Suk Yoon (April 2005), "[W]e believe strong to moderate relationship (sic) of those 6 key measures of PQ quality with teachers' self-reported measures of PD outcomes demonstrates some predictive validity." Second, the Survey had been the tool for multiple studies of professional development (Birman et al., 2000; Desimone et al., 2002; Garet et al., 2001; Porter et al., 2003, 2000). Third, the Survey offered the opportunity to draw quantitative relationships between research-based, high-quality features of professional development and professional learning community activities. Fourth, it allowed for some generalization of results to a larger population of similar participants experiencing professional learning community activities that exhibit Garet's

(1999) features (Babbie, 1990). And fifth, it allowed for timely analysis of data (Babbie, 1990).

Figure 6: Measurements of internal consistency for Garet et al's (1999) professional development features and outcomes using Cronbach's alpha (p.E-15)

Professional development feature or outcome	Cronbach's alpha scale reliability rating
Collective participation	Scale reliability=.35
Content focus	Scale reliability not given (feature defined as a binary, yes/no variable)
Active learning	Scale reliability=.84
Coherence	Scale reliability=.71
Enhanced knowledge and skills	Scale reliability=.78
Change in teaching practice	Scale reliability=.87

The survey data for this study were analyzed using descriptive statistics. Howell (2002) notes that descriptive statistics are appropriate when the "purpose is merely to describe a set of data" (p.5). Because of the small size of the Central Middle faculty, and because there was no intent with this study to generalize to a larger population, it was determined that the use of descriptive statistics, as opposed to inferential statistics, would be most appropriate in addressing the research questions. The following quantitative data collection and analysis steps were used to answer the first two research questions:

- Research question #1: Which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and pedagogical knowledge and skills and with changes in teachers' instructional practices for core academic middle school teachers in a first year school?
    - Garet's (1999) survey was completed by teachers at the test site

    - Data averages and percentages were analyzed (average scores for each question item and pd feature, and percentage groupings for each question item and pd feature)
    - Relationships between the features of professional learning community activities and changes in teachers' content and pedagogical knowledge and skills and changes in instructional practices were analyzed
- Research question #2: Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics—including years of teaching experience (divided into the three categories reported by North Carolina schools: 0-3 years, 4-10 years, and 10+ years), grade level taught, and subject taught— for core academic middle school teachers in a first year school?
    - Features of professional learning community activities were analyzed based on the independent variables of years of teaching experience, grade level taught, and subject taught
    - Changes in teachers' content and pedagogical knowledge and skills and instructional practices were analyzed based on the independent variables of years of teaching experience, grade level taught, and subject taught

Qualitative Data Collection and Interview Questions

For the qualitative aspect of the study, a purposefully selected sample of 10 teachers were selected and interviewed by the primary researcher and a secondary researcher, and school documents were collected and analyzed. Interviews were conducted for two purposes: first, to explore the inter-relationship of professional learning community activities, professional development characteristics, and individual teacher instructional behavior changes; and second, to address threats to the quantitative portion of the study. Teachers were selected to ensure that there was balanced grade and subject level representation, along with balanced representation from teachers of various levels of teaching experience. For a copy of the interview questions, please see Appendix D. Documents were also analyzed to further triangulate data and findings. According the Merriam (1998), documents "can furnish descriptive information, verify emerging hypotheses, advance new categories and hypotheses, offer historical understanding, track change and development, and so on" (p.126). Furthermore, "Documentary data are 'objective' sources of data compared to other forms…[and] documentary data are particularly good sources of *qualitative* case studies because they can ground an investigation in the context of the problem being investigated" (Merriam, 1998, p.126, emphasis in original).

The following qualitative data collection and analysis steps were used to answer each of the three research questions:

- Research question #1: Which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and pedagogical knowledge and skills and with changes in

teachers' instructional practices for core academic middle school teachers in a first year school?

  - Purposeful sample of approximately 10 teachers that represented various years of teaching experience, subjects, and grade levels were interviewed
  - School documents relating to professional learning community activities were collected
  - Interview and document data was sorted and analyzed, looking for trends in terms of connections or lack of connections between Garet's (1999) individual criteria and professional learning community activities
  - Interview and document data were sorted and analyzed, looking for trends in terms of connections or lack of connections between Garet's (1999) individual criteria and changes in teacher knowledge and skills and instructional decision-making
  - Interview data collected by the primary researcher and secondary researcher were compared to explore possible biases in the interview process

- Research question #2: Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics—including years of teaching experience (divided into the three categories reported by North Carolina schools: 0-3 years, 4-10 years, and 10+

years), grade level taught, and subject taught— for core academic middle school teachers in a first year school?

    - A purposeful sample of approximately 10 teachers that represented various years of teaching experience, subjects, and grade levels were interviewed
    - School documents relating to professional learning community activities were collected
    - Interview and document data were sorted and analyzed by teacher characteristics, looking for trends in terms of connections or lack of connections between Garet's (1999) individual criteria and professional learning community activities
    - Interview and document data were sorted and analyzed by teacher characteristics, looking for trends in terms of connections or lack of connections between Garet's (1999) individual criteria and changes in teacher knowledge and skills and instructional decision-making
    - Interview data collected by the primary researcher and secondary researcher were compared to explore possible biases in the interview process

- Research question #3: In what ways do organizational and personnel factors—specifically, intra-organizational social dynamics, the character of the principal, structured planning time, and use of a block schedule—influence

the teacher improvement efficacy of professional learning community activities for core academic middle school teachers in a first year school?

- A purposeful sample of approximately 10 teachers that represented various years of experience, subjects, and grade levels were interviewed
- School documents relating to professional learning community activities were collected
- Interview and document data were sorted and analyzed by organizational and personnel factors, looking for trends in terms of connections or lack of connections between Garet's (1999) individual criteria, professional learning community activities, and changes in teacher knowledge and skills and instructional decision-making
- Interview data collected by the primary researcher and secondary researcher were compared to explore possible biases in the interview process

Chapter 4

Using Garet et al.'s (1999) features of high-quality professional development as a theoretical lens, this case study investigated the relationship between professional learning community activities and teacher improvement for core middle school teachers in a first year school designed around DuFour's (2004b) professional learning community principles. In exploring this relationship, the study relied on three sources of data: teacher survey information from Garet et al.'s (1999) Teacher Activity Survey, which focused on quantifying the features of professional learning community activities; school documents, such as minutes from department and school meetings, the school Web site, the School Improvement Plan, and internal surveys; and interview data from one-on-one interviews with 10 purposefully selected teachers. Specifically, the study addressed the following three research questions:

1. Which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and pedagogical knowledge and skills and changes in teachers' instructional practices for core academic middle school teachers in a first year school?
2. Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics—including years of teaching experience (divided into the three categories reported by North Carolina schools: 0-3 years, 4-10 years, and 10+ years),

grade level taught, and subject taught— for core academic middle school teachers in a first year school?

3. In what ways do organizational and personnel factors—specifically, intra-organizational social dynamics, the personality and leadership style of the principal, structured planning time, and use of a block schedule—influence the teacher improvement efficacy of professional learning community activities for core academic middle school teachers in a first year school?

This chapter presents the results of analyses of the data described above. The chapter is divided into two sections. The first section summarizes the results of analyses of teacher responses to the Teacher Activity Survey, and the second section summarizes the results of the document review and teacher interviews.

Results of Teacher Responses to the Teacher Activity Survey

This section summarizes the results from the Teacher Activity Survey. The section begins with a summary of response rates for the survey. Next, relationships between Garet et al.'s (1999) professional development features and changes in teachers' content and pedagogical knowledge and skills and changes in teachers' instructional practices are identified. This section then presents detailed survey results around each of Garet et al.'s (1999) professional development features, changes in teachers' content and pedagogical knowledge skills, and changes in teachers' instructional practices; these results are further disaggregated by grade level, subject area, and levels of experience. The section concludes with a summary of the results as they relate to the first two research questions.

In relation to all Teacher Activity Survey data, it is important to note that the data were analyzed and are presented solely in descriptive terms. Howell (2002) notes that descriptive statistics are appropriate when the "purpose is merely to describe a set of data" (p.5). Because of the small size of the Central Middle faculty, and because there is no intent with this study to generalize to a larger population, it was determined that the use of descriptive statistics, as opposed to inferential statistics, would be most appropriate in addressing the research questions.

Summary of Survey Response Rates

During the 2004-05 school year, there were 24 full-time core academic teachers at Central Middle. The grade level and subject area breakdown for these 24 teachers is presented in Table 3.

Table 3: Breakdown of core academic teachers for the 2004-05 school year

Grade	Total	Language Arts	Math	Social Studies	Science
6	10	5	5	0*	0*
7	8	3	3	1**	1**
8	6	2	2	1	1
Total	24	10	10	2	2

* 6th grade teachers each taught two subjects, either Language Arts and Social Studies or Math and Science. Because Language Arts and Math were the two subjects to which teachers devoted the most instructional time, 6th grade teachers were asked to complete the Teacher Activity Survey only in relation to their major subject teaching area.

** One 7th grade teacher taught both Language Arts and Social Studies, while another 7th grade teacher taught both Math and Science. These teachers were asked to complete the

Teacher Activity Survey in relation to their major subject teaching areas, which were Language Arts and Math respectively.

Of the 24 original teachers at Central, one 6th grade Math/Science teacher left mid-way through the year and did not return, and was subsequently replaced by a new teacher who taught for the second half of the year. Because this study was interested in participants who were at Central for the full academic year, it was therefore limited to the 23 teachers who were present for the entire year. Of those 23 teachers, one 6th grade Language Arts/Social Studies teacher and one 7th grade Language Arts/Social Studies teacher left the school at the end of the year, and one 7th grade Science teacher was on maternity leave at the time of the study. While attempts were made to contact two of these teachers, for whom addresses were available, they were ultimately not reached for participation in the study.

A total of 15 Teacher Activity Surveys were completed and returned, which represents 65% of all full-time core academic teachers (15 out of 23) from the 2004-05 year and a response rate of 75% (15 out of the 20 teachers available to participate). Table 4 summarizes the response rates by grade level and subject area.

Table 4: Teacher Activity Survey response rates by grade level and subject area

Group	Total	Total available for participation	Surveys returned	Response rate
6th grade	9	8	6	75%
7th grade	8	6	4	67%
8th grade	6	6	5	83%
Language Arts	10	8	6	75%
Math	9	9	6	67%
Social Studies	2	2	2	100%
Science	2	1	1	100%

Relationships Between Professional Development Features and Outcomes

Relationships between professional development features and changes in both teachers' knowledge and skills and changes in teachers' instructional practices were measured using Pearson's Product Moment Correlation, which is a measure of the strength of the linear relationship between two variables with no implied causality. Because of the small size of the test population, the lack of intent to generalize to outside populations, and the descriptive nature of the analyses, significance levels were not included in the analyses and are not reported in the data below.

Relationships between PLC features and changes in knowledge and skills

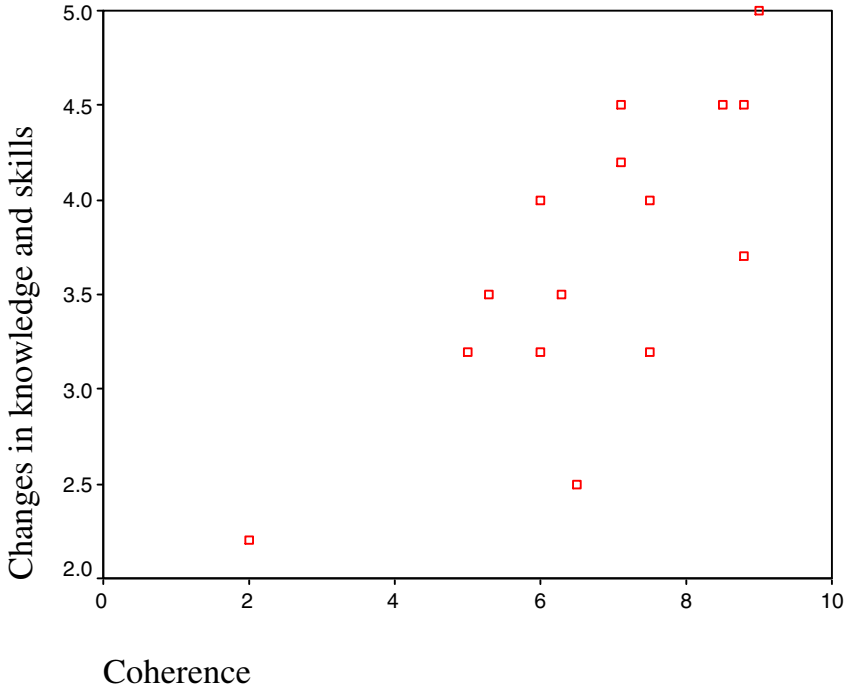
Table 5 presents the correlation coefficients for the relationships between each individual professional development feature and changes in teachers' knowledge and skills. As can be seen in Table 5, three of the four variables—content focus, active learning, and coherence—correlated positively with changes in teachers' knowledge and skills. This suggests that, as the extent to which each of these professional development features was increasingly evident in professional learning community activities, teachers indicated increasing levels of change in their knowledge and skills. This relationship mimics the overall trend in Garet et al.'s (1999) Teacher Activity Survey data, in which professional development features also showed positive relationships with teacher outcomes.

Table 5: Relationship between professional development features and changes in teachers' knowledge and skills

Professional Development Feature	Correlation to Changes in Teachers' Knowledge and Skills
Collective participation	-.315
Content focus	.402
Active learning	.313
Coherence	.753

One variable in particular, coherence, demonstrated a notably strong positive relationship with changes in teachers' knowledge and skills. As the level of coherence in professional learning community activities increased, teachers indicated increasing changes in knowledge and skills. Figure 7 displays a graphic representation of this relationship, in which coherence is measured on a 0- to 9-point scale (the higher the score, the higher the level of coherence) and changes in knowledge and skills are measured on a 1- to 5-point scale (the higher the score, the greater the change in knowledge and skills).

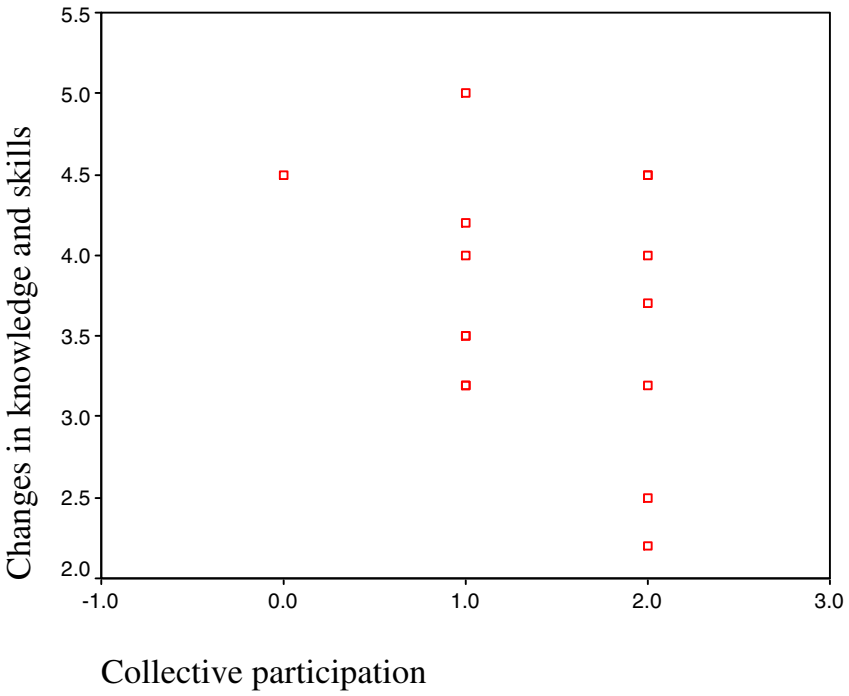
Figure 7: Relationship between coherence and changes in teachers' knowledge and skills



The fourth feature, collective participation, had a negative relationship with changes in teachers' knowledge and skills. This suggests that, as teachers indicated higher levels of collective participation as a characteristic of professional learning community activities, they indicated decreased changes in knowledge and skills. Collective participation was measured through the survey on an additive two-point scale. Teachers were asked to indicate whether or not professional learning community activities included all teachers in department or grade-level groupings, and whether or not they included all teachers in the school. Indicating neither situation resulted in a score of 0, indicating one situation resulted in a score of 1, and indicating both situations resulted in a score of 2. Of the four teachers who indicated that PLC activities did not include all

teachers in department or grade-level groupings, three were Science or Social Studies teachers, who had either one same-subject peer or no same-subject peers at each grade level. Of the five teachers who indicated that PLC activities did not include all teachers in the school, four were Language Arts teachers. Figure 8 displays a graphic representation of the relationship between collective participation and changes in knowledge and skills.

Figure 8: Relationship between collective participation and changes in teachers' knowledge and skills



Relationships between PLC features and changes in teaching practices

Table 6 presents the correlation coefficients for the relationships between each individual professional development feature and changes in teaching practices As can be seen in Table 6, three of the four variables—content focus, active learning, and

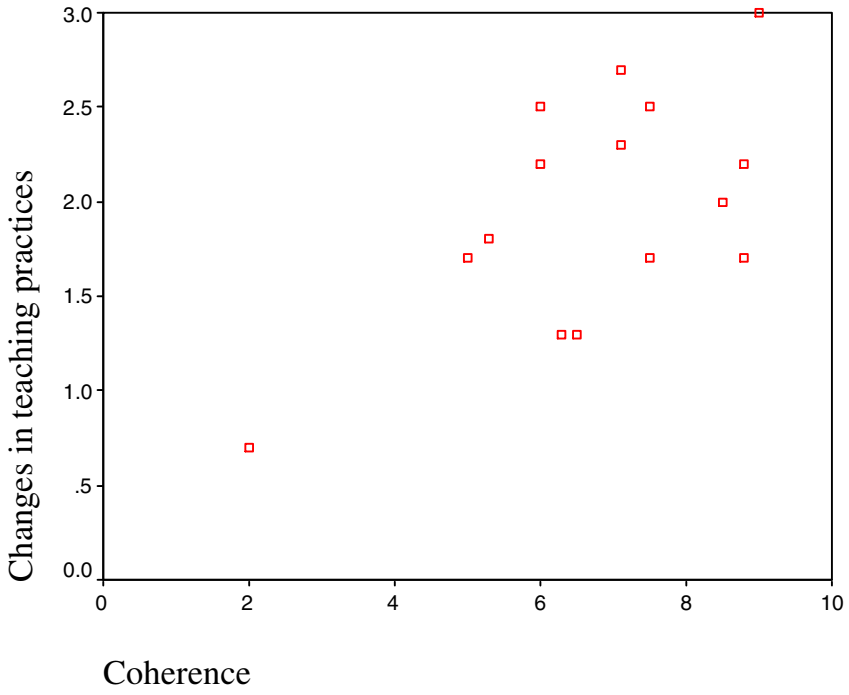
coherence—correlated positively with changes in teachers' knowledge and skills. This suggests that, as the extent to which each of these professional development features was increasingly evident in professional learning community activities, teachers indicated increasing levels of change in their teaching practices. This relationship also mimics the overall trend in Garet et al.'s (1999) Teacher Activity Survey data, in which professional development features showed positive relationships with teacher outcomes.

Table 6: Relationship between professional development features and changes in teaching practices

Professional Development Feature	Correlation to Changes in Teaching Practices
Collective participation	-.455
Content focus	.214
Active learning	.372
Coherence	.612

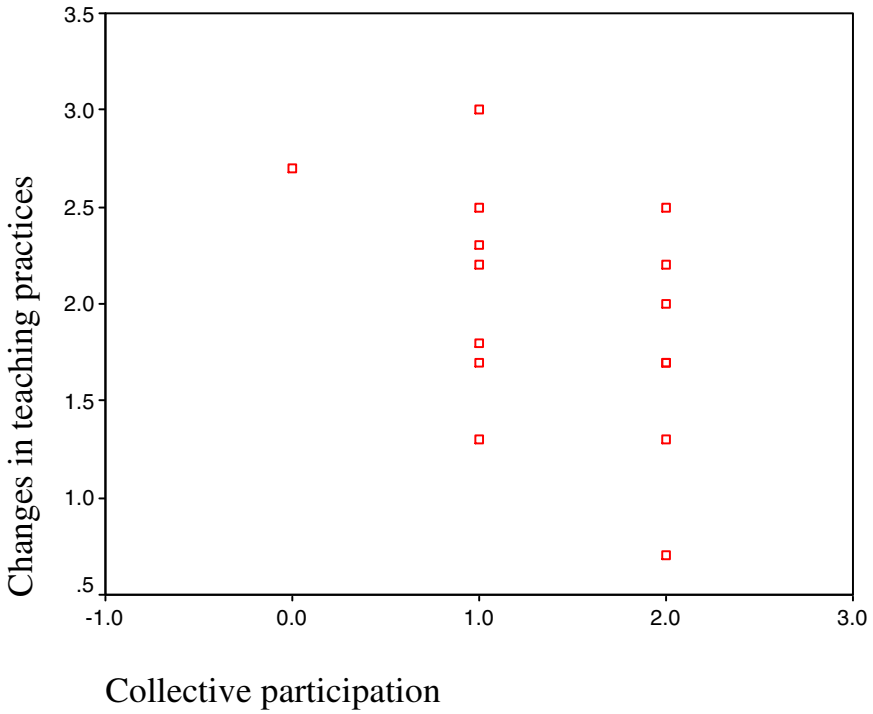
As was true with changes in teachers' knowledge and skills, coherence also demonstrated the strongest positive relationship with changes in teaching practices. As the level of coherence in professional learning community activities increased, teachers indicated increasing changes in their practices. Once again, this was a particularly strong relationship at .612. Figure 9 displays a graphic representation of this relationship, in which coherence is measured on a 0- to 9-point scale (the higher the score, the higher the level of coherence) and changes in teaching practices are measured on a 0- to 3-point scale (the higher the score, the greater the change in teaching practices).

Figure 9: Relationship between coherence and changes in teaching practices



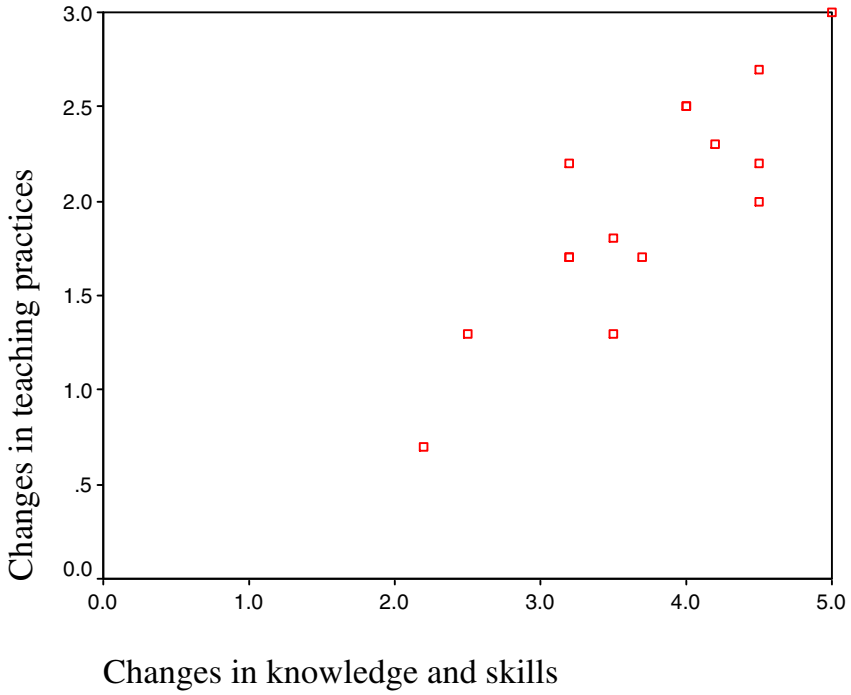
As was true with changes in teachers' knowledge and skills, collective participation also demonstrated a negative relationship with changes in teaching practices. This suggests that, as teachers indicated higher levels of collective participation as a characteristic of professional learning community activities, they indicated decreased changes in teaching practices. Figure 10 displays this representation graphically. An explanation and interpretation of this relationship is discussed more fully in the following chapter.

Figure 10: Relationship between collective participation and changes in teaching practices



Finally, a strong relationship existed between changes in teachers' knowledge and skills and changes in teaching practices. The correlation between the two outcomes was .852. While this relationship was not considered in the original hypotheses, it nevertheless mirrors the strong correlation between changes in knowledge and skills and changes in teaching practices that existed in Garet et al.'s (1999) Teacher Activity Survey data. Figure 11 presents a graphic display of the relationship between changes in knowledge and skills and teaching practices at Central Middle.

Figure 11: Relationship between changes in teachers' knowledge and skills and changes in teaching practices



Detailed Survey Results by Professional Development Feature and Outcome

This part of the section presents detailed results of participants' responses to the Teacher Activity Survey. These responses are organized by Garet et al.'s (1999) professional development features—collective participation, content focus, active learning, and coherence—and professional development outcomes: changes in knowledge and skills, and changes in teaching practices. Two of Garet et al.'s (1999) professional development features, type of activity and duration, are not summarized here because they were homogenous features within the population, i.e., all professional learning community activities at Central Middle would be considered "reform" activities

and the number of contact hours and duration of PLC activities were similar throughout the school.

Results for each professional development feature are presented in detail and disaggregated by grade level, subject area, and years of experience. In some cases, due to the fact that several of Garet et al.'s (1999) professional development features include numerous sub-components, disaggregated results are presented in Appendix E rather than in this chapter. Also, because only a small number of teachers identified themselves as Science and Social Studies teachers (one and two, respectively), and only one teacher identified him/herself as having between one and three years of teaching experience, those sub-populations were not considered in cross-group comparisons.

Collective participation

Collective participation refers to the grouping of participants in professional development by some common characteristic, such as grade level, discipline, or even school. On Garet et al.'s (1999) Teacher Activity Survey, collective participation was measured by asking teachers to indicate whether professional learning community activities comprised either all teachers in department or grade-level groupings, and/or all teachers in the school. Overall, approximately three-fourths of Central Middle teachers indicated that professional learning community activities included all teachers in department or grade-level groupings, and two-thirds of teachers indicated that professional learning community activities included all teachers in the school. While there was slight variation across grade levels, subject areas, and levels of experience, none of these variations were remarkable, with one exception: only 33% of Language

Arts teachers indicated that professional learning community activities included all teachers in the school, whereas the participant average was 67%.

Tables 7 through 9 summarize the survey results for collective participation for teachers at Central Middle School, including disaggregated results by grade level (Table 7), by teaching discipline (Table 8), and by years of experience (Table 9). Finally, each table also includes results from Garet et al.'s (1999) nationally representative sample of teachers that had participated in Eisenhower supported professional development activities (p.3-17). Overall, Central Middle teachers reported significantly higher levels of collective participation in professional learning community activities than teachers from Garet et al.'s (1999) national sample reported in their professional development experiences (Garet et al. (1999) did not report collective participation as an average score, but average scores are computed for Central Middle teachers for the sake of comparison).

Table 7: Levels of collective participation in PLC activities (Results reported for all respondents and by grade level)

	All	6th	7th	8th	**Natl. Sample**
All teachers in department or grade-level groupings	**73%**	83%	75%	60%	**20%**
All teachers in the school	**67%**	67%	50%	80%	**19%**
Mean scores	**1.40**	1.50	1.25	1.40	**NA**
Standard deviation	**(.63)**	(.55)	(.96)	(.55)	**NA**
n=	15	6	4	5	783

Table 8: Levels of collective participation in PLC activities (Results reported for all respondents and by teaching discipline)

	All	LA	MA	SC	SS	Natl. Sample
All teachers in department or grade-level groupings	**73%**	100%	83%	0%	0%	**20%**
All teachers in the school	**67%**	33%	100%	100%	50%	**19%**
Mean scores	**1.40**	1.33	1.83	1.00	.50	**NA**
Standard deviation	**(.63)**	(.52)	(.41)	.	(.71)	**NA**
n=	15	6	6	1	2	783

Table 9: Levels of collective participation in PLC activities (Results reported for all respondents and by years of experience)

	All	0-3	4-10	10+	Natl. Sample
All teachers in department or grade-level groupings	**73%**	100%	75%	67%	**20%**
All teachers in the school	**67%**	100%	75%	50%	**19%**
Mean scores	**1.40**	2.00	1.50	1.17	**NA**
Standard deviation	**(.63)**	.	(.76)	(.41)	**NA**
n=	15	1	8	6	783

Content Focus

A focus on content in professional development comprises two separate dimensions: first, an effort to enhance teachers' knowledge of particular content (e.g., knowledge of U.S. history); and second, an effort to enhance teachers' knowledge of effective instructional practices to teach specific content to students. On Garet et al.'s (1999) Teacher Activity Survey, content focus was measured by asking teachers to indicate the level of emphasis that professional learning community activities devoted to deepening participants' knowledge of their subject area, using a three-point scale (*0=no emphasis, 1=minor emphasis, 2=major emphasis*). While Central Middle teachers overall

reported a moderate emphasis on subject-area content (mean of 1.29), there were discrepancies across grade level and subject area lines. The 7th grade teachers reported a significantly higher level of content focus (mean of 1.75) than did either 6th grade (mean of 1.17) or 8th grade (mean of 1.00) teachers. In addition, Math teachers reported a significantly higher level of content focus (mean of 1.67) than did Language Arts teachers (mean of 1.00). Because of the small numbers of Science and Social Studies teachers completing the survey, their results were not considered in comparison to Math and Language Arts results. In terms of levels of experience, there were no significant differences.

Tables 10 through 12 summarize the survey results for teachers at Central Middle School, including disaggregated results by grade level (Table 10), by teaching discipline (Table 11), and by years of experience (Table 12). Each table also includes results from Garet et al.'s (1999) nationally representative sample of teachers that had participated in Eisenhower supported professional development activities (p.E-3-4). Overall, the level of content focus reported by Central Middle teachers for professional learning community activities was not significantly different from that reported by teachers from Garet et al.'s (1999) national sample for their professional development experiences.

Table 10: Level of emphasis in PLC activities on developing participants' content knowledge (Results reported for all respondents and by grade level)

	All	Grade Level			Natl. Sample
		6th	7th	8th	
No Emphasis (0)	**7%**	17%	0%	0%	**15%**
Minor Emphasis (1)	**57%**	50%	25%	100%	**35%**
Major Emphasis (2)	**36%**	33%	75%	0%	**51%**
Mean scores	**1.29**	1.17	1.75	1.00	**1.36**
Standard deviation	**(.61)**	(.75)	(.50)	(.00)	**(.72)**
n=	14	6	4	4	754

Table 11: Level of emphasis in PLC activities on developing participants' content knowledge (Results reported for all respondents and by teaching discipline)

	All	Teaching Disciplines				Natl. Sample
		LA	MA	SC	SS	
No Emphasis (0)	**7%**	17%	0%	0%	0%	**15%**
Minor Emphasis (1)	**57%**	66%	33%	100%	100%	**35%**
Major Emphasis (2)	**36%**	17%	67%	0%	0%	**51%**
Mean scores	**1.29**	1.00	1.67	1.00	1.00	**1.36**
Standard deviation	**(.61)**	(.63)	(.52)	.	.	**(.72)**
n=	14	6	6	1	1	754

Table 12: Level of emphasis in PLC activities on developing participants' content knowledge (Results reported for all respondents and by years of experience)

	All	Years of Experience			Natl. Sample
		0-3	4-10	10+	
No Emphasis (0)	**7%**	0%	12%	0%	**15%**
Minor Emphasis (1)	**57%**	0%	50%	80%	**35%**
Major Emphasis (2)	**36%**	100%	38%	20%	**51%**
Mean scores	**1.29**	2.00	1.25	1.20	**1.36**
Standard deviation	**(.61)**	.	(.71)	(.45)	**(.72)**
n=	14	1	8	5	754

Active Learning

Active learning includes four dimensions, all of which focus on opportunities for teachers to directly cognitively engage with new knowledge and skills. Those four dimensions are: 1) observing and being observed in the classroom; 2) planning classroom implementation (e.g., practicing under simulated conditions, discussing classroom implementation with colleagues); 3) reviewing student work; and 4) presenting, leading, and writing (e.g., giving a lecture or presentation, conducting a demonstration of a lesson). On Garet et al.'s (1999) Teacher Activity Survey, active learning was measured across each of those four dimensions, and a final composite score of all four dimensions was also calculated.

In general, Central Middle teachers reported high incidences of active learning in professional learning community activities. Activities that included teacher-to-teacher collaboration in a structured environment (e.g., holding formal meetings, developing lesson plans collaboratively, reviewing student work with colleagues, scoring assessments with colleagues) were reported most frequently. While there were no significant differences across grade levels, subject areas, or experience levels in terms of overall incidences of active learning, small discrepancies did emerge for individual components. For example, while 83% of 6th grade teachers reported having other teachers observe them teaching, only 25% of 7th grade teachers and 20% of 8th grade teachers reported this component. In addition, while 83% of Language Arts teachers reported opportunities to lead small group discussions, only 33% of Math teachers reported this component. Tables 16 through 18 summarize the survey results for all 18 active learning

components across the four dimensions, including disaggregated results by grade level (Table 16), by teaching discipline (Table 17), and by years of experience (Table 18).

Tables 13 through 15 summarize the composite scores for active learning, which sum all of the possible types of active learning included in the survey (the composite score can range from 0 to 20 and includes score weightings to ensure that each dimension is given similar weight). Composite scores are disaggregated by grade level (Table 13), by teaching discipline (Table 14), and by years of experience (Table 15).

Each table also includes composite score results from Garet et al.'s (1999) survey results (p.E-6). When compared to a national sample, Central Middle's professional learning community activities appear to have had significantly higher incidences of active learning than might be expected in typical professional development experiences. While the national average for active learning opportunities for Garet et al.'s (1999) sample was 3.6 out of 20, Central Middle's average was 9.8, with 6th grade teachers reporting an average of 11.9 active learning opportunities and Language Arts teachers reporting an average of 12.7. When looking at specific active learning components, there were some striking contrasts between the results reported by Central Middle's teachers and Garet et al.'s (1999) national sample. For example, while 87% of Central Middle's teachers reported having their classrooms observed, reviewing student work with other teachers, and scoring assessments with other teachers, less than 20% of Garet et al.'s (1999) respondents reported their professional development experiences as incorporating any of these three measures.

Table 13: Total number of opportunities for active learning in PLC activities

(Results reported for all respondents and by grade level)

	All	Grade Level			Natl. Sample
		6th	7th	8th	
Total number of active learning opportunities	**9.8**	11.9	9.0	8.0	**3.6**
Standard deviation	**(4.34)**	(3.95)	(5.13)	(3.86)	**(3.49)**
n=	15	6	4	5	767

Table 14: Total number of opportunities for active learning in PLC activities

(Results reported for all respondents and by teaching discipline)

	All	Teaching Disciplines				Natl. Sample
		LA	MA	SC	SS	
Total number of active learning opportunities	**9.8**	12.7	9.1	4.8	5.7	**3.6**
Standard deviation	**(4.34)**	(2.10)	(4.87)	.	(3.04)	**(3.49)**
n=	15	6	6	1	2	767

Table 15: Total number of opportunities for active learning in PLC activities

(Results reported for all respondents and by years of experience)

	All	Years of Experience			Natl. Sample
		0-3	4-10	10+	
Total number of active learning opportunities	**9.8**	15	8.4	10.8	**3.6**
Standard deviation	**(4.34)**	.	(4.45)	(3.91)	**(3.49)**
n=	15	1	8	6	767

Table 16: Percent of teachers reporting that professional learning community activities included specific active learning components, organized by active learning categories (Results reported for all respondents and by grade level)

Active Learning Category	Active Learning Component	All	Grade Level			Natl. Sample
			6th	7th	8th	
Opportunities to observe or be observed teaching	Teacher received coaching	**7%**	17%	0%	0%	**10%**
	Leader observed teacher teaching	**40%**	33%	50%	40%	**5%**
	Others observed teacher teaching	**47%**	83%	25%	20%	**10%**
	Teacher's classroom observed	**87%**	83%	75%	100%	**5%**
Opportunities to plan classroom implementation	Practiced in simulated conditions	**13%**	0%	25%	20%	**29%**
	Held formal meetings	**87%**	83%	100%	80%	**32%**
	Communicated with leader	**53%**	67%	0%	80%	**36%**
	Held informal meetings	**67%**	83%	50%	60%	**47%**
	Developed lesson plans	**73%**	100%	50%	60%	**30%**
Opportunities to examine student work	Teacher reviewed student work	**87%**	100%	75%	80%	**19%**
	Scored assessments	**87%**	83%	100%	80%	**9%**
	Leader/others reviewed student work	**20%**	33%	25%	0%	**11%**
	Student outcomes evaluated	**47%**	50%	50%	40%	**9%**
Opportunities to present, lead, and write	Gave lecture or presentation	**20%**	33%	25%	0%	**18%**
	Conducted a demonstration	**40%**	67%	25%	20%	**24%**
	Led a whole-group discussion	**33%**	50%	50%	0%	**8%**
	Led a small-group discussion	**47%**	67%	50%	20%	**17%**
	Wrote a report	**20%**	33%	25%	0%	**15%**
	n=	15	6	4	5	783

Table 17: Percent of teachers reporting that professional learning community activities included specific active learning components, organized by active learning categories (Results reported for all respondents and by teaching discipline)

Active Learning Category	Active Learning Component	All	Teaching Disciplines				Natl. Sample
			LA	MA	SC	SS	
Opportunities to observe or be observed teaching	Teacher received coaching	**7%**	0%	17%	0%	0%	**10%**
	Leader observed teacher teaching	**40%**	67%	33%	0%	0%	**5%**
	Others observed teacher teaching	**47%**	67%	50%	0%	0%	**10%**
	Teacher's classroom observed	**87%**	83%	100%	100%	0%	**5%**
Opportunities to plan classroom implementation	Practiced in simulated conditions	**13%**	33%	0%	0%	0%	**29%**
	Held formal meetings	**87%**	100%	83%	0%	100%	**32%**
	Communicated with leader	**53%**	67%	33%	100%	50%	**36%**
	Held informal meetings	**67%**	100%	50%	0%	50%	**47%**
	Developed lesson plans	**73%**	100%	67%	0%	50%	**30%**
Opportunities to examine student work	Teacher reviewed student work	**87%**	100%	67%	100%	100%	**19%**
	Scored assessments	**87%**	83%	83%	100%	100%	**9%**
	Leader/others reviewed student work	**20%**	33%	17%	0%	0%	**11%**
	Student outcomes evaluated	**47%**	50%	67%	0%	0%	**9%**
Opportunities to present, lead, and write	Gave lecture or presentation	**20%**	33%	17%	0%	0%	**18%**
	Conducted a demonstration	**40%**	67%	33%	0%	0%	**24%**
	Led a whole-group discussion	**33%**	50%	33%	0%	0%	**8%**
	Led a small-group discussion	**47%**	83%	33%	0%	0%	**17%**
	Wrote a report	**20%**	33%	17%	0%	0%	**15%**
	n=	15	6	6	1	2	783

Table 18: Percent of teachers reporting that professional learning community activities included specific active learning components, organized by active learning categories (Results reported for all respondents and by years of experience)

Active Learning Category	Active Learning Component	All	Years of Experience			Natl. Sample
			0-3	4-10	10+	
Opportunities to observe or be observed teaching	Teacher received coaching	**7%**	100%	0%	0%	**10%**
	Leader observed teacher teaching	**40%**	100%	13%	67%	**5%**
	Others observed teacher teaching	**47%**	100%	50%	33%	**10%**
	Teacher's classroom observed	**87%**	100%	88%	83%	**5%**
Opportunities to plan classroom implementation	Practiced in simulated conditions	**13%**	0%	0%	33%	**29%**
	Held formal meetings	**87%**	100%	88%	83%	**32%**
	Communicated with leader	**53%**	100%	25%	83%	**36%**
	Held informal meetings	**67%**	100%	50%	83%	**47%**
	Developed lesson plans	**73%**	100%	63%	83%	**30%**
Opportunities to examine student work	Teacher reviewed student work	**87%**	100%	75%	100%	**19%**
	Scored assessments	**87%**	100%	75%	100%	**9%**
	Leader/others reviewed student work	**20%**	100%	0%	33%	**11%**
	Student outcomes evaluated	**47%**	100%	50%	33%	**9%**
Opportunities to present, lead, and write	Gave lecture or presentation	**20%**	0%	25%	17%	**18%**
	Conducted a demonstration	**40%**	100%	38%	33%	**24%**
	Led a whole-group discussion	**33%**	0%	38%	33%	**8%**
	Led a small-group discussion	**47%**	0%	50%	50%	**17%**
	Wrote a report	**20%**	0%	25%	17%	**15%**
	n=	15	1	8	6	783

Coherence

"Coherence", as defined by Garet et al. (1999), includes three dimensions: first, connecting professional development with teacher and school goals and other professional activities; second, aligning training content and pedagogy emphasized in the training with state and district standards and assessments; and third, providing opportunities for professional communication among teachers engaged in similar efforts. On Garet et al.'s (1999) Teacher Activity Survey, coherence was measured across each of those three dimensions, and a final composite score of all three dimensions was also calculated (the composite score can range from 0 to 9 and includes score weightings to ensure that each dimension is given similar weight).

Central Middle teachers reported relatively high levels of coherence overall (composite mean of 6.8 on a 0 to 9 scale), but there were clear differences across grade level lines. In terms of composite coherence scores, 7th grade teachers had the highest mean score of 8.4, followed by 6th grade with a mean score of 6.7 and 8th grade teachers with a mean score of 5.5. There were no significant differences across subject areas or years of experience. Tables 19 through 21 summarize the composite scores for coherence, disaggregated by grade level (Table 19), by teaching discipline (Table 20), and by years of experience (Table 21).

When broken down by individual coherence components, the only dramatic difference was in response to the question, "Did you discuss what you learned during the 2004/2005 academic year with other teachers in your school or department *who did not attend* the activity?" For this question, 100% of 6th and 7th grade teachers answered

affirmatively while only 40% of 8th grade teachers answered affirmatively. Across the other individual components, while there were no dramatic differences across grade levels, the 8th grade scores trended lower than 6th and 7th grade scores for all but one of the components. Tables 22 through 24 summarize the survey results for all 8 coherence components across the three dimensions, including disaggregated results by by grade level (Table 22), by teaching discipline (Table 23), and by years of experience (Table 24).

Each coherence table also includes composite score results from Garet et al.'s (1999) survey results (p.E-7-8). When compared to a national sample, Central Middle's professional learning community activities appeared to exhibit slightly higher levels of coherence schoolwide, with the national average for coherence at 5.94 and the average for all respondents at Central Middle at 6.8. Central's 8th grade teachers' reported level of coherence (5.5) was slightly below the national average, 6th grade teachers (6.7) were slightly above the national average, and 8th grade teachers (8.4) were significantly above the national average.

Table 19: Degree to which professional learning community activities fostered coherence (Results reported for all respondents and by grade level)

	All	Grade Level			Natl. Sample
		6th	7th	8th	
Composite coherence score	**6.8**	6.7	8.4	5.5	**5.94**
Standard deviation	**(1.83)**	(1.35)	(.86)	(2.11)	**(1.92)**
n=	15	6	4	5	747

Table 20: Degree to which professional learning community activities fostered coherence (Results reported for all respondents and by teaching discipline)

	All	Teaching Disciplines				Natl. Sample
		LA	MA	SC	SS	
Composite coherence score	**6.8**	6.5	6.9	7.5	6.7	**5.94**
Standard deviation	**(1.83)**	(1.45)	(2.64)	.	(.57)	**(1.92)**
n=	15	6	6	1	2	747

Table 21: Degree to which professional learning community activities fostered coherence (Results reported for all respondents and by years of experience)

	All	Years of Experience			Natl. Sample
		0-3	4-10	10+	
Composite coherence score	**6.8**	8.8	6.5	6.8	**5.94**
Standard deviation	**(1.83)**	.	(2.20)	(1.31)	**(1.92)**
n=	15	1	8	6	747

Table 22: Percent of teachers reporting that professional learning community activities included specific coherence components (for the first five components, either a score of 4 or 5 on a 5-point scale), organized by coherence categories (Results reported for all respondents and by grade level)

Coherence Category	Coherence Component	All	Grade Level			Natl. Sample
			6th	7th	8th	
Activities related to other professional development	Consistent with goals	**93%**	100%	100%	80%	**79%**
	Build on earlier activities	**90%**	100%	100%	75%	**35%**
	Followed up with additional activities	**83%**	75%	100%	75%	**53%**
Activities aligned with state and district standards, frameworks,	Designed to support state and district standards	**87%**	83%	100%	80%	**79%**
	Designed to support state and district assessments	**87%**	83%	100%	80%	**80%**
Communicated with other teachers about experiences	Discussed with other teachers	**79%**	100%	100%	40%	**73%**
	Discussed with administration	**93%**	100%	100%	80%	**63%**
	Communicated with teachers in other schools	**53%**	50%	75%	40%	**41%**
	n=	10 to 15	2 to 6	4	4 to 5	748 to 783

Table 23: Percent of teachers reporting that professional learning community activities included specific coherence components (for the first five components, either a score of 4 or 5 on a 5-point scale), organized by coherence categories (Results reported for all respondents and by teaching discipline)

Active Learning Category	Active Learning Component	All	Teaching Disciplines				Natl. Sample
			LA	MA	SC	SS	
Activities related to other professional development experiences	Consistent with goals	**93%**	100%	83%	100%	100%	**79%**
	Build on earlier activities	**90%**	100%	80%	100%	100%	**35%**
	Followed up with additional activities	**83%**	75%	80%	100%	100%	**53%**
Activities aligned with state and district standards, frameworks,	Designed to support state and district standards	**87%**	83%	83%	100%	100%	**79%**
	Designed to support state and district assessments	**87%**	83%	83%	100%	100%	**80%**
Communicated with other teachers about experiences	Discussed with other teachers	**79%**	83%	80%	100%	50%	**73%**
	Discussed with administration	**93%**	100%	83%	100%	100%	**63%**
	Communicated with teachers in other schools	**53%**	50%	67%	100%	0%	**41%**
	n=	10 to 15	2 to 6	5 to 6	1	2	748 to 783

Table 24: Percent of teachers reporting that professional learning community activities included specific coherence components (for the first five components, either a score of 4 or 5 on a 5-point scale), organized by coherence categories (Results reported for all respondents and by years of experience)

Active Learning Category	Active Learning Component	All	Years of Experience			Natl. Sample
			0-3	4-10	10+	
Activities related to other professional development	Consistent with goals	**93%**	100%	88%	100%	**79%**
	Build on earlier activities	**90%**	100%	80%	100%	**35%**
	Followed up with additional activities	**83%**	100%	71%	100%	**53%**
Activities aligned with state and district standards, frameworks,	Designed to support state and district standards	**87%**	100%	75%	100%	**79%**
	Designed to support state and district assessments	**87%**	100%	75%	100%	**80%**
Communicated with other teachers about experiences	Discussed with other teachers	**79%**	100%	86%	67%	**73%**
	Discussed with administration	**93%**	100%	88%	100%	**63%**
	Communicated with teachers in other schools	**53%**	100%	50%	50%	**41%**
	n=	10 to 15	1	5 to 8	4 to 6	748 to 783

Enhanced knowledge and skills

On Garet et al.'s (1999) Teacher Activity Survey, enhanced knowledge and skills were measured across six areas:

- Curriculum (e.g., units, texts, standards)
- Instructional methods
- Approaches to assessment

- Use of technology in instruction (e.g., computers, graphing calculators)
- Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)
- Deepening knowledge of subject area (p.3-40)

Teachers reported their responses using a five-point scale, where 1=not at all and 5=great extent, and scores across the six areas were averaged for a composite score. As a faculty, Central Middle teachers reported relatively high levels of change in knowledge and skills, with an average score of 3.7. There were, however, significant differences across grade levels. The 7th grade teachers reported the highest levels of change with an average score of 4.4, while 6th grade teachers had an average score of 3.9. These scores represent high levels of reported change independently, but are also particularly high when compared to the national average of 3.19 obtained in Garet et al.'s (1999, p.E-9) study. The lowest score was that of 8th grade teachers, with an average of 3.0, which was significantly different from the 7th and 6th grade scores, and fell just below the national average reported by Garet et al. (1999). Tables 25 through 27 summarize the composite scores for knowledge and skills including disaggregated results by grade level (Table 25), by teaching discipline (Table 26), and by years of experience (Table 27). There were no significant differences between teachers from various subject areas and teachers with various levels of experience.

When looking at each of the six individual areas of enhanced knowledge and skills, significant patterns emerge. While Central teachers indicated high levels of change in the areas of curriculum, instructional methods, and approaches to assessment—at least

80% of teachers scored the level of change for these three areas as a "4" or "5"—far fewer teachers indicated changes in knowledge and skills related to the use of technology, approaches to diversity, and in-depth knowledge of content area. In addition, 8th grade teachers' scores across the six individual areas were lower than both the other grades in all cases but approaches to diversity, in which 6th grade teachers' scores were slightly below that of 8th grade teachers scores. Tables 28 through 30 summarize the survey results for all 8 coherence components across the three dimensions, including disaggregated results by by grade level (Table 28), by teaching discipline (Table 29), and by years of experience (Table 30).

Table 25: Extent to which participation in professional learning community activities enhanced knowledge and skills (Results reported for all respondents and by grade level)

	All	Grade Level			Natl. Sample
		6th	7th	8th	
Overall average knowledge and skills score	**3.7**	3.9	4.4	3.0	**3.19**
Standard deviation	**(.78)**	(.54)	(.54)	(.60)	**(.89)**
n=	15	6	4	5	750

Table 26: Extent to which participation in professional learning community activities enhanced knowledge and skills (Results reported for all respondents and by teaching discipline)

	All	Teaching Disciplines				Natl. Sample
		LA	MA	SC	SS	
Overall average knowledge and skills score	**3.7**	3.6	3.8	3.2	4.0	**3.19**
Standard deviation	**(.78)**	(.88)	(.85)	.	(.71)	**(.89)**
n=	15	6	6	1	2	750

Table 27: Extent to which participation in professional learning community activities enhanced knowledge and skills (Results reported for all respondents and by years of experience)

	All	Years of Experience			Natl. Sample
		0-3	4-10	10+	
Overall average knowledge and skills score	**3.7**	4.5	3.8	3.5	**3.19**
Standard deviation	**(.78)**	.	(.77)	(.83)	**(.89)**
n=	15	1	8	6	750

Table 28: Percent of teachers reporting enhanced knowledge and skills due to participation in professional learning community activities (either a score of 4 or 5 on a 5-point scale) (Results reported for all respondents and by grade level)

	All	Grade Level			Natl. Sample
		6th	7th	8th	
Curriculum	**80%**	100%	100%	40%	**56%**
Instructional methods	**87%**	100%	100%	60%	**63%**
Approaches to assessment	**80%**	83%	100%	60%	**46%**
Use of technology	**27%**	17%	75%	0%	**25%**
Approaches to diversity	**47%**	33%	75%	40%	**26%**
In-depth knowledge of content area	**33%**	50%	50%	0%	**48%**
n=	15	6	4	5	731 to750

Table 29: Percent of teachers reporting enhanced knowledge and skills due to participation in professional learning community activities (either a score of 4 or 5 on a 5-point scale) (Results reported for all respondents and by teaching discipline)

	All	Teaching Disciplines				Natl. Sample
		LA	MA	SC	SS	
Curriculum	**80%**	83%	83%	100%	100%	**56%**
Instructional methods	**87%**	83%	83%	100%	100%	**63%**
Approaches to assessment	**80%**	67%	83%	100%	100%	**46%**
Use of technology	**27%**	17%	33%	0%	50%	**25%**
Approaches to diversity	**47%**	33%	50%	0%	100%	**26%**
In-depth knowledge of content area	**33%**	33%	33%	0%	50%	**48%**
n=	15	6	6	1	2	731 to750

Table 30: Percent of teachers reporting enhanced knowledge and skills due to participation in professional learning community activities (either a score of 4 or 5 on a 5-point scale) (Results reported for all respondents and by years of experience)

	All	Years of Experience			Natl. Sample
		0-3	4-10	10+	
Curriculum	**80%**	100%	88%	67%	**56%**
Instructional methods	**87%**	100%	88%	83%	**63%**
Approaches to assessment	**80%**	100%	88%	67%	**46%**
Use of technology	**27%**	100%	25%	17%	**25%**
Approaches to diversity	**47%**	0%	50%	50%	**26%**
In-depth knowledge of content area	**33%**	100%	38%	17%	**48%**
n=	15	1	8	6	731 to750

Change in teaching practices

On Garet et al.'s (1999) Teacher Activity Survey, changes in teaching practices were measured across six areas:

- The subject area curriculum content
- The cognitive challenge of subject area classroom activities
- The instructional methods employed
- The types or mix of assessments used to evaluate students
- The ways in which technologies (calculator or computer) are used in instruction
- The approaches taken to student diversity (p.3-43)

Teachers reported their responses using a four-point scale, where 0=no change and 3=significant change, and scores across the six areas were averaged for a composite score. As a faculty, Central Middle teachers reported moderate levels of change in their teaching practices as a result of participation in professional learning community activities, with an average score of 2.0. As was true with changes in knowledge and skills, there were significant differences across grade levels in terms of changes in teaching practices. The 7th grade teachers reported the highest levels of change with an average score of 2.35 (indicating more than "moderate" but less than "significant" changes in teaching practices), and 6th grade teachers had an average score of 2.23. These scores represent high levels of reported change independently, but are also particularly high when compared to the national average of 1.27 obtained in Garet et al.'s (1999, p.E-10) study. The 8th grade teachers had the lowest score, with an average of 1.36 (indicating more than "minor" but less than "moderate" changes in teaching practices). This score

was significantly lower than the scores for 6th and 7th grade teachers, and slightly above the national average reported by Garet et al. (1999). Tables 31 through 33 summarize the composite scores for changes in teaching practices including disaggregated results by grade level (Table 31), by teaching discipline (Table 32), and by years of experience (Table 33). There were no significant differences between teachers from various subject areas and teachers with various levels of experience.

When looking at each of the six individual areas of changes in teaching practices, some significant patterns emerge. A majority of 6th and 7th grade teachers indicated relatively high levels of change—a score of either "2" or "3"—across all six areas, while a majority of 8th grade teachers indicated high levels of change in only the areas of curriculum and instructional methods. In fact, with the exception of changes in curriculum, 8th grade teachers' scores closely mimicked those of Garet et al.'s (1999) national sample, with discrepancies no greater than 15 percentage points. One interesting difference also emerged when looking at subject area data: while 100% of Language Arts teachers indicated high levels of change in the area of curriculum, only 33% of Math teachers did so. Tables 34 through 36 summarize the survey results for all 8 coherence components across the three dimensions, including disaggregated results by grade level (Table 34), by teaching discipline (Table 35), and by years of experience (Table 36).

Table 31: Degree of improvement in classroom teaching practices due to participation in professional learning community activities (Results reported for all respondents and by grade level)

	All	Grade Level			Natl. Sample
		6th	7th	8th	
Composite coherence score	**2.00**	2.23	2.35	1.36	**1.27**
Standard deviation	**(.61)**	(.30)	(.60)	(.43)	**(.80)**
n=	15	6	4	5	767

Table 32: Degree of improvement in classroom teaching practices due to participation in professional learning community activities (Results reported for all respondents and by teaching discipline)

	All	Teaching Disciplines				Natl. Sample
		LA	MA	SC	SS	
Composite coherence score	**2.00**	2.05	1.93	1.70	2.00	**1.27**
Standard deviation	**(.61)**	(.59)	(.68)	.	(1.00)	**(.80)**
n=	15	6	6	1	2	767

Table 33: Degree of improvement in classroom teaching practices due to participation in professional learning community activities (Results reported for all respondents and by years of experience)

	All	Years of Experience			Natl. Sample
		0-3	4-10	10+	
Composite coherence score	**2.00**	2.20	2.01	1.88	**1.27**
Standard deviation	**(.61)**	.	(.65)	(.64)	**(.80)**
n=	15	1	8	6	767

Table 34: Percent of teachers reporting improvement in classroom teaching practices due to participation in professional learning community activities (either a score of 2 or 3 on a 0 to 3 point scale) (Results reported for all respondents and by grade level)

	All	Grade Level			Natl. Sample
		6th	7th	8th	
Curriculum	**73%**	83%	50%	80%	**46%**
Cognitive challenge	**80%**	100%	100%	40%	**55%**
Instructional methods	**87%**	100%	100%	60%	**58%**
Approaches to assessment	**80%**	100%	100%	40%	**45%**
Use of technology	**53%**	67%	75%	20%	**29%**
Approaches to diversity	**60%**	83%	75%	20%	**31%**
n=	15	6	4	5	731 to750

Table 35: Percent of teachers reporting improvement in classroom teaching practices due to participation in professional learning community activities (either a score of 2 or 3 on a 0 to 3 point scale) (Results reported for all respondents and by teaching discipline)

	All	Teaching Disciplines				Natl. Sample
		LA	MA	SC	SS	
Curriculum	**73%**	100%	33%	100%	100%	**46%**
Cognitive challenge	**80%**	83%	83%	100%	50%	**55%**
Instructional methods	**87%**	83%	83%	100%	100%	**58%**
Approaches to assessment	**80%**	83%	83%	100%	50%	**45%**
Use of technology	**53%**	50%	67%	0%	50%	**29%**
Approaches to diversity	**60%**	67%	67%	0%	50%	**31%**
n=	15	6	6	1	2	731 to750

Table 36: Percent of teachers reporting improvement in classroom teaching practices due to participation in professional learning community activities (either a score of 2 or 3 on a 0 to 3 point scale) (Results reported for all respondents and by years of experience)

	All	Years of Experience			Natl. Sample
		0-3	4-10	10+	
Curriculum	**73%**	100%	50%	100%	**46%**
Cognitive challenge	**80%**	100%	88%	67%	**55%**
Instructional methods	**87%**	100%	88%	83%	**58%**
Approaches to assessment	**80%**	100%	88%	67%	**45%**
Use of technology	**53%**	100%	63%	33%	**29%**
Approaches to diversity	**60%**	100%	63%	50%	**31%**
n=	15	1	8	6	731 to750

Summary of Survey Data in Relation to Research Questions

This part of the section summarizes the data from Teacher Activity Survey in relation to the first two research questions, which were:

1. Which features of professional learning community activities, if any, demonstrate a significant relationship with both changes in teachers' content and pedagogical knowledge and skills and with teachers' instructional practices for core academic middle school teachers in a first year school?
2. Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics—including years of teaching experience (divided into the three categories reported by North Carolina schools: 0-3 years, 4-10 years, and 10+ years),

grade level taught, and subject taught— for core academic middle school teachers in a first year school?

Research question #1

In general, each of Garet et al.'s (1999) professional development features demonstrated a relationship to both changes in teachers' knowledge and skills and changes in teachers' instructional practices, with three of those features—content focus, active learning, and coherence—demonstrating positive relationships and collective participation demonstrating a negative relationship. Of Garet et al.'s (1999) four features, coherence demonstrated the strongest relationship to teacher outcomes, which was also true of Garet et al.'s (1999) national teacher sample.

The first research question was: Which features of professional learning community activities, if any, demonstrate a significant relationship with both changes in teachers' content and pedagogical knowledge and skills and with teachers' instructional practices for core academic middle school teachers in a first year school? Each hypothesis, with its corresponding results, is summarized below:

- Hypothesis #1: The following professional development features, as components of professional learning community activities, will have no relationship to improvements in teacher content and pedagogical knowledge and skills: collective participation, focus on content, promoting active learning, and fostering coherence.
    - Collective participation demonstrated a negative relationship to improvements in teacher content and pedagogical knowledge and skills

    - Focus on content, promoting active learning, and fostering coherence each demonstrated a positive relationship to improvements in teacher content and pedagogical knowledge and skills
    - Coherence demonstrated the strongest relationship to improvements in teacher content and pedagogical knowledge and skills
- Hypothesis #2: The following professional development features, as components of professional learning community activities, will have no relationship to changes in teacher instructional practice: collective participation, focus on content, promoting active learning, and fostering coherence.
    - Collective participation demonstrated a negative relationship to changes in teacher instructional practices
    - Focus on content, promoting active learning, and fostering coherence each demonstrated a positive relationship to changes in teacher instructional practices
    - Coherence demonstrated the strongest relationship to changes in teacher instructional practices

Research question #2

In terms of differences across Central Middle teacher sub-groups (i.e., grade levels, subject areas, and years of experience), the results varied by professional development feature, but one common theme emerged: 8th grade teachers reported lower

incidences of high quality professional development features and lower levels of professional improvement than did 6th and 7th grade teachers.

The second research question was: Which features of professional learning community activities, if any, demonstrate a significant relationship with both changes in teachers' content and pedagogical knowledge and skills and with teachers' instructional practices for core academic middle school teachers in a first year school? Each hypothesis, with its corresponding results, is summarized below:

- Hypothesis #1: There will be no difference in the identified level of collective participation (+/- .5 point on 0 to 2 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
    - There were no differences based on years of teaching experience or grade level; a difference did exist between Language Arts and Math teachers, with Math teachers indicating a higher degree of collective participation (difference of .5) than did Language Arts teachers.
- Hypothesis #2: There will be no difference in the identified level of focus on content (+/- .5 point on 0 to 2 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
    - There was no difference based on years of teaching experience; a difference did exist between 7th grade teachers (mean score of 1.75) and 6th grade (1.17) and 8th grade (1.00) teachers; a

difference did exist between Math teachers (mean score of 1.67) and Language Arts teachers (1.00).

- Hypothesis #3: There will be no difference in the identified level of promoting active learning (+/- 5 points on a 0 to 20 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
    - There were no differences based on years of teaching experience, grade level taught, or subject taught.
- Hypothesis #4: There will be no difference in the identified level of fostering coherence (+/- 2.25 points on a 0 to 9 point scale), as a feature of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
    - There were no differences based on years of teaching experience or subject taught; a difference did exist between 7th grade teachers (mean score of 8.4) and 8th grade teachers (5.5).
- Hypothesis #5: There will be no difference in the identified level of changes in content and pedagogical knowledge and skills (+/- 1 point on a 1 to 5 point scale), as a result of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
    - There were no differences based on years of teaching experience or subject taught; a difference did exist between 7th grade teachers (mean score of 4.4) and 8th grade teachers (3.0).

- Hypothesis #6: There will be no difference in the identified level of changes in instructional practice (+/- .75 on a 0 to 3 point scale), as a result of professional learning community activities, based on respondents' years of teaching experience, grade level taught, or subject taught.
    - There were no differences based on years of teaching experience or subject taught; a difference did exist between 7th grade teachers (mean score of 2.35), 6th grade teachers (2.23), and 8th grade teachers (1.36).

Results of Document Review and Teacher Interviews

This section summarizes the results from interviews with ten purposefully selected teachers and a review of multiple school documents, minutes from department and school meetings, the school Web site, the School Improvement Plan, and internal surveys. Table 37 summarizes the breakdown of teacher interviewees in terms of their grade levels, primary subject areas, and years of teaching experience. Of the ten interviewees, eight were interviewed by the primary researcher and two were interviewed by a secondary researcher. As part of the data analysis process, these interviews were compared to determine whether or not interviewees reacted differently depending on the interviewer. One concern in the study design was that, because the primary researcher had previously worked at the test site, participants might color their responses depending upon who interviewed them. From an analysis of interview data, it was determined that the substance of information obtained in interviews by both the primary researcher and the secondary researcher was similar in terms of content and depth.

Table 37: Number of teacher interviewees broken down by grade level, subject area, and years of teaching experience

6th grade	7th grade	8th grade
4 interviewees	4 interviewees	2 interviewees

Math	Language Arts	Social Studies	Science
4 interviewees	4 interviewees	1 interviewee	1 interviewee

0-3 years teaching experience	4-10 years teaching experience	10+ years teaching experience
2 interviewees	5 interviewees	3 interviewees

The interviews and document review resulted in data that suggested trends at the school and sub-group levels, and the data also revealed individual anomalies. After multiple stages of analysis, the data were grouped and are presented here in the following four categories:

- Descriptions of teachers' backgrounds and previous experiences
- The nature of PLC activities at Central Middle
- The relationship between PLC activities and teacher improvement for the interviewed teachers
- PLC activities in the context of the organization

Teachers' backgrounds and previous experiences

The interviewed teachers represented a range of backgrounds. Almost all of the teachers had taught previously within the same county before coming to Central Middle, but many of them had taught at different grade levels or different subjects than what they taught at Central. Three of the teachers—one 6th grade teacher and two 7th grade

teachers—had previously taught with Central's principal and were recruited by him to come to Central, and several of the teachers had taught at other schools together before coming to Central. In terms of instructional practices in their previous schools, the teachers indicated varying practices that ranged from lecture-based, whole-group instruction to more student-centered, hands-on activities. There was a trend in former instructional style towards more hands-on, project-based activities at the 6th grade and more teacher-directed instruction at the 8th grade, but these trends were not black and white; as one 6th grade teacher who had taught out of subject in the previous year mentioned, "My class was more lecture based and teacher centered, and I was teaching a subject I wasn't terribly familiar with… I let the textbook be my curriculum guide because I didn't know the curriculum terribly well."

This teacher's comment represents an anomaly, however, in terms of familiarity with content area. While some teachers indicated a lack of familiarity with the specific curriculum standards at their grade level (this was due either to teaching a new grade level at Central, recent rewrites in the curriculum standards at the state level, or lack of familiarity with North Carolina standards because of previous teaching experience in another state), all of the teachers indicated a high degree of familiarity with the primary subject area that they taught at Central. The only exception occurred for 6th grade teachers, who each taught two subjects—6th grade teachers either taught Language Arts and Social Studies or Math and Science—and in some cases were less familiar with their secondary teaching assignment (either Social Studies or Science).

Teachers' experiences with professional development in their previous schools were mixed. Each teacher was able to identify at least one formal professional

development experience from the previous year that had been positive. These positive professional development experiences shared a number of Garet et al.'s (1999) professional development features: they tended to include extensive contact hours over an extended period of time (duration); they included working with other teachers in a collaborative setting (collective participation); and they related to applicable classroom strategies (active learning). Examples of these professional development experiences ranged from learning how to implement student-led conferences to training on classroom paideia seminars (which focus on student conversations) to identifying effective classroom management strategies. Nevertheless, while all of the teachers could identify at least one positive experience, they were also able to identify numerous negative experiences. The primary complaint about negative professional development experiences at previous schools was that they were not well aligned with teachers' needs. One 6th grade teacher observed that, "Professional development was chosen for us with little input as to what teachers wanted or felt they needed… it was oftentimes below my ability level." An 8th grade teacher, in commenting on a workshop on using newspapers in the math classroom, noted that, "The professional development was not applicable, and I was only there because the state said you had to take a reading credit," while another 6th grade teacher noted, "If I can apply it to my classroom I love it; otherwise it's a waste of my time."

While only one teacher indicated having worked previously in a formal professional learning community environment, most teachers had worked in collaborative teams that incorporated at least some of the elements of a professional learning community, although these collaborations were typically created on an ad hoc basis. In

most of these cases, the teacher had sought out collaborative opportunities and formed a partnership with another teacher of his or her own volition, collaborating through this partnership on issues of curriculum and instruction. In some instances the teacher had planned activities with another teacher, and in one instance this joint planning resulted in some team teaching. At the opposite ends of the collaboration spectrum, one teacher had previously worked in a professional learning community school in which PLC tenets had been a daily part of the workday, while another teacher indicated that relationships with other teachers in his building had been "cordial but not collegial in a professional way—we laughed together and ate a whole lot of sheet cake". At an even greater extreme, a third teacher had experienced a work environment that bordered on competitive:

> There were a lot of teachers who were not willing to plan together, to be on the same page, to help each other out with activities—more like a competition or survival. One teacher had been teaching for 26 years, she didn't like that young teachers were coming in with new ideas, wanted it to seem like she had the best ideas. She did different activities from other people so that she would get praised for it—very competitive…
> She would also hide all of the science kits and say that because we hadn't taken the [Science professional development] course we couldn't use them.

The nature of plc activities

Across all three grade levels, teachers at Central Middle reported meeting regularly to discuss administrative issues, such as consistent discipline practices, grading

procedures, parent information, etc. At the 6th and 7th grades, where professional learning teams had between three and five people per team, these meetings extended to collaboration focusing on curricular and instructional issues, but this practice had not happened to the same extent at the 8th grade, where teams were limited to two people (lower 8th grade enrollment at the school resulted in a smaller 8th grade teaching staff). In contrasting examples of the types of professional learning team conversations at the 6th and 8th grades, one 6th grade teacher noted that, "I have to be willing to try these activities that I wouldn't normally, that's what we do as a group—I'm one of the leaders of the group saying let's do best practices, so I have to be willing to look at what I do—when someone brings a new idea I don't like, I can't ignore it," while an 8th grade teacher said, "Some people want to go into teaching because they want to express their own creativity—that shouldn't be forgotten… if you're asked to do something you're not comfortable doing, I don't agree with that—how effective will you be if you don't agree with it?" This grade level distinction carried through across multiple data categories.

Most PLC teams met on a weekly basis, usually for up to an hour at a time. For the most part, these meetings comprised grade-level members, and same-discipline teachers at each grade level met most frequently together. Staff members had met as a whole faculty at the beginning of the year, at which time the entire faculty participated in social activities, created the school's mission statement, and outlined school core beliefs—as one teacher noted, "That was great learning about each other and how to work together!" At the 6th and 7th grades, PLC subject team meetings focused on identifying the specific curriculum and standards to teach, along with creating common assessments and sharing instructional practices. One 7th grade teacher summed up the

substance and range of these activities: "We have met to do an interdisciplinary unit—we each chose objectives to teach using a novel and as a whole grade level; we meet to discuss grade level business, field trips, strategies for non-successful students, and rearrange schedules to have math remediation/extension in the afternoon."

According to interview data, PLC activities seemed to exhibit most of Garet et al.'s (1999) features of high-quality professional development. Activities were of significant duration, they included participation of teachers at the same grade level and in the same subject area, they included active learning opportunities (especially in terms of planning instruction), and they aligned directly with district and state level curricular expectations. There were, however, differences in the substance of activities between grade levels. While at the 8th grade teachers might "swap ideas, talk about where we are in the curriculum, share some instructional materials," at the 6th and 7th grades this extended to deeper levels of collaboration:

> We all had common assessments, common lessons, we all taught the same lessons. We all take our previous knowledge and our previous work that we had done on a particular unit, bring that to the table, talk about best practices that we had used, then we all used each others' activities and ideas to try it out. And also we reflected afterwards how we felt about activities and units, how well students had done, we did pre and post assessments to chart student growth—that guided our instruction.

Notably absent from most descriptions of PLC activities, however, was a focus on content knowledge. While many teachers indicated PLC team conversations focused around the curriculum standards , the sequence of standards to teach over the course of

the year, and assessments related to curriculum standards, PLC team meetings did not focus on building participants' content knowledge.

While deeper collaboration does appear to have occurred at the 6th and 7th grade levels, one teacher noted an interesting perspective on that collaboration: "It's really about teaching—what and how are we going to teach—but it's not about student learning…. I think people have the intention of focusing on student learning, but really they focus on how they teach—I have yet to hear people talk about how many students have learned a concept, but I hear people talking about what great teachers we have—I think all our teachers are very strong, but you don't hear as much about the kids." In other words, most PLC conversations focused on what and how teachers would teach, but very little time was devoted to identify how well students were learning and which strategies seemed to be most successful in promoting student learning. Interviews suggested that some conversations focused around student learning, and that these conversations were increasing in frequency as the year progressed, but through a review of the notes of various PLC team meetings, it became apparent that this teacher's comment was insightful. The large majority of PLC meeting time was devoted either to administrative issues, such as field trips or grading practices, or to curriculum and instruction issues. Very little time was devoted to discussions of student performance data, student learning styles, or at-risk students. In several PLC teams, teachers divided planning responsibilities so that one teacher would take responsibility for planning a unit and then deliver all of the teaching materials to the other teachers to use. PLC meetings then often focused on discussing the state of curriculum materials and a round-up of where each teacher was in the curriculum sequence. Discussions of instructional

strategies did occur—in fact, teachers at the 6th grade indicated multiple opportunities to observe each other teaching and subsequent discussions of those experiences—but those discussions only infrequently connected to concrete student learning data or observations.

Relationship between PLC activities and teacher improvement

Almost all of the 6th and 7th grade teachers indicated that PLC activities had an impact on their professional improvement. As one experienced and accomplished teacher put it:

> [My] instruction has changed because I use more small group things now than ever before. The other people keep bringing small group activities to the table. I've tried things I wouldn't—that's awesome. Thinking about kids, there are 30 or 40 of my kids for whom my approach would work great—kids who like stories love me. But I have 60 students, so some kids wouldn't have their needs met. Without the PLC, I would have been less effective with those kids. By having plans coming from other people who are different teachers, I'm probably reaching more of my students.

In discussing professional improvement related to PLC activities, teachers focused almost exclusively on instructional and assessment strategies—"more inquiry learning going on this year as opposed to last year", "much more indirect, more of the role as a facilitator", "I have changed by doing more pre and post assessments, which I had never done before "—and improved instructional organization: "instruction is more organized, I have more time to focus on actually teaching, on activities, before it was just me planning everything for all subjects." There was little mention of improvement in

terms of content knowledge, with two exceptions. For 6th grade teachers, who all teach two subjects, some teachers indicated expanded content knowledge in their secondary subject: "I feel like I have taken science to a new level, I bring more lab activities to kids because of knowledge I have gained from PLC members—my knowledge has improved so my presentation of information is more confident and accurate." Other teachers indicated a deeper awareness of content standards as a result of PLC activities; for example, "[Instruction] is more focused on the standards—that's not to say that I didn't include standards in lessons last year, but it is highly structured around standards this year, last year I used the standards where I could fit them in." Nevertheless, teachers were consistent in responding that PLC activities had not led to increased knowledge of their primary content area: "Very few of our meetings have given me additional content knowledge or exposed me to different content knowledge."

For 8th grade teachers, PLC activities seemed to hold a more tenuous relationship to professional improvement. While both 8th grade teachers interviewed spoke positively of PLC activities, they attributed any professional growth to factors outside of the PLC structure. In one case, the teacher attributed professional growth to working with a new age group and independent improvement efforts, noting that, "Not much has changed as a result of PLC activities— I do a lot of reading in math journals, search on the Internet for best practices in math—it all comes back to problem solving, authentic problems, getting kids to show different ways to get to answers—that seems to be the consensus of the best way to teach."

When teachers at Central did indicate professional improvement as a result of PLC activities, the indicated catalyst was most often the opportunity to collaborate with others. As one 6th grade Math teacher said:

> My development in previous years was based on my own reflection and perceptions—I only had myself. This year I can reflect through the eyes of four to nine other people. When you're only looking at it from your own perspective, you can't see that it might be you. When you have so many eyes to see things, that alone has helped with my reflection and growth—10 times more growth this year than in previous years because I'm seeing things through at least ten other eyes. I have the opportunity to not only work with them and reflect with them, but to see things from their perspective as well as my own.

This idea of professional collaboration and support was one of the strongest themes to emerge from the interviews. Another 6th grade teacher said, "Before [at previous school] I was thrown into a pool and it was sink or swim, here there is such a support system, I have grown tremendously." Even at the 8th grade, the idea of collegial support was important: "Knowing that there's somebody down the hall if you have a question, if you're wondering how to approach something instructionally, somebody you can talk to about it, won't give you the feeling that you have to figure it out yourself." And the other 8th grade teacher mentioned the absence of a greater number of PLC members as an obstacle to professional growth, noting that "When there are only two in your PLC, there need to be more, with only two in a PLC and we disagree, and you know I know I'm right, you either convince or you give up, and if you really should be teaching

one thing and there's just two of you and you disagree that's hard, so the PLC needs to be bigger so you can have a majority."

The flip side of larger groups, however, was the added difficulty of reaching consensus and the gradual process of group norming. As one teacher pointed out, "Because we all have agreed to do the same lesson and format, at times when I would want to go off in a different direction or do something in a different way, it has been frustrating—that's why we reflect on the lessons afterwards, those reflections really help—in a way it restricted me this year but it has also made me grow and be more open to different ideas." Norming was therefore identified as both a positive process, in that it led to experimentation with new teaching techniques, and a negative process, in that individuals sometimes felt constrained to deviate from agreed-upon norms. In addition, the regular process of collaboration resulted in more frequent personality conflicts. As one teacher put it:

> It's been hard for me to see people get so upset over things that long term are not going to have a huge impact. It has been really difficult to bite my tongue sometimes and say it doesn't matter because I think, you have to talk about things and work things out, when people take things personally it becomes a problem… When you're dealing with people in the PLC the way we have, when people are sharing ideas, dealing with conflict has been interesting, to say the least.

This theme of group conflict was reiterated by multiple teachers at the 6th and 7th grades. While the opportunity to learn from others was a positive outgrowth of

collaboration, the flip side was that collaboration was often a difficult process to negotiate. As one 7th grade teacher put it:

> With most groupings of people you're going to have people who tend to dominate and think their way is the right way… having to gently get that person to evolve and try other ideas has been a process… we still have to be productive and we still have to get along…having to balance the voices has been a challenge.

PLC activities in the context of the organization

Across grade levels and subject areas, teachers were clear in placing the successes of the PLC model within the larger organizational context. That is, while teachers spoke very positively about PLC activities, they indicated that it was not just the PLC model per se that had been successful, but rather the PLC model as one important piece in a web of organizational factors. Teachers alluded to the combination of personalities at Central, the principal, the fact that it was a new school, and the structure of the daily schedule as factors that underlay Central's perceived success.

The first tenet of a PLC is a shared commitment to student learning, and the fact that Central was a first-year school allowed the faculty to set that commitment from day one. As one teacher said:

> A big success that came about was it being a brand new school so vision was set forth in the beginning. When we were being interviewed about collaboration, we all had the same goal, the same vision, we all knew that we would be working together, so there were no issues there. I think that is

> the main reason that we are so successful—you have to have everyone on the same page, you have to have everyone ready to work because it takes a lot. When you have five people you have different ideas and styles, but having the underlying goal that we're here to serve the students, to do what's best for students, that's what's made it so successful.

One teacher noted the difficulty that Central might face in the future, once the newness of the school faded: "As new people come into [Central] I don't know how easy it will be to keep a PLC. People are creatures of habit, as a new person comes in with new ideas, it will be hard even in a group like this to change ideas."

This concept of newness bled into discussions of the teaching personalities at Central. Most teachers saw the combination of personalities at Central as a positive factor that contributed to perceived successes; as one teacher described it, "Unique combination of personalities has led largely to successes. As a result of openness those strengths are shared across multiple people. There are things I'm not good at that other people are good at. I couldn't be support team chair, but someone else can. I couldn't be the person who thought about emotional support but other people can do that." At the same time, however, personalities were seen by some teachers as an organizational challenge:

> I felt like we have been very successful this year despite the fact that we all have very different personalities. I don't think our personalities have hindered the PLC, sometimes it causes tension when somebody doesn't pull their weight. I'm sure that causes some tension, but as far as personalities go, because everyone gets a fair share no matter their personality, I think that alleviates the problems of personalities. It's

understood that everyone has an equal say whether or not they speak it, that's up to them.

Leadership emerged as one of the most important factors underlying perceived success. Some teachers spoke specifically of the role that the principal played in the school: "I attribute it all to [the principal] because of the people he hired, setting those standards and those goals for us at the very beginning, making sure we understood what was to be expected of us." From another teacher, "He hired the faculty, he delegated that authority out, but the amount of responsibility and faith he placed in us, he set that up as the model and people rose to the challenge." And yet another: "I think that all of the success is attributable to [the principal]—he is a motivator, whether through fear, praise, intimidation, he uses lots of strategies to get people to work in the PLCs. I attribute it all to him—he is the engine behind the machine."

Other teachers spoke about the process that the principal used in making decisions, focusing on the collaborative and distributed nature of decision making. As one teacher said, "[The principal] is not afraid of empowered teachers, not afraid of the kinds of conversations teachers have. He has never come back to us and said, 'Do what I want.' We very much believe that if we make a decision that's right for kids, that we can do it." Another teacher spoke to the principal's communication style and the way that his style reinforced the concept of distributed decision making: "His way of communicating, maybe not even saying something or saying something that is thought provoking—he's not going to tell you what to think, and that is essential in the PLC." On the flip side, however, one teacher identified some challenges inherent in distributed leadership; namely, that there are situations in which decisions need to be made quickly and do not

require discussion, and that an ethic of distributed leadership can at times lead to frustration:

> As a school PLC, one thing that I've noticed, maybe more at the beginning of the year, sometimes there were decisions that needed to be an executive decision because sometimes too many hands in the kettle is bad. When you talk about the whole school as a PLC there were some decisions that just needed to be made rather than mulled over by the whole group, maybe he [the principal] could have stepped in… I think that he knows the staff well enough that he could make some decisions like that without bothering us because he knows all of us so well, and some principals aren't like that.

Finally, interviewees identified the school's block schedule and structured common planning time as integral pieces of Central's perceived success. In general, it seemed that form followed function: the block schedule allowed for more student-centered teaching strategies, which were encouraged through PLC activities, and common planning time provided the opportunity for intensive collaboration, which was identified by teachers as the most important element in the perceived successes of PLC activities. One teacher noted that, "I don't think we would be able to get as much done without 90 minutes of planning. I hear from other schools how difficult it is to talk to other people in same grade level because they don't have common planning." Another teacher put it simply: "100% [of the success] is due to common planning time—it would fall apart without common planning time."

Chapter 5

The purpose of this study was to investigate the relationship between professional learning community activities and teacher improvement in a school adopting DuFour's (2004b) model of a PLC. In doing so, this study employed a case study methodology that focused on a first-year middle school and combined both quantitative and qualitative data. In addition, the study relied on Garet et al.'s (1999) professional development framework to describe and explore the nature of professional learning community activities and their relationship to teacher outcomes. Specifically, this study addressed three research questions:

1. Which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and pedagogical knowledge and skills and with changes in teachers' instructional practices for core academic middle school teachers in a first year school?
2. Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics— including years of teaching experience (divided into the three categories reported by North Carolina schools: 0-3 years, 4-10 years, and 10+ years), grade level taught, and subject taught— for core academic middle school teachers in a first year school?
3. In what ways do organizational and personnel factors—specifically, intra-organizational social dynamics, the personality and leadership style of the

principal, structured planning time, and use of a block schedule—influence the teacher improvement efficacy of professional learning community activities for core academic middle school teachers in a first year school?

This chapter summarizes key findings from the study, beginning with a reflection on the effectiveness of the study design and Garet et al.'s (1999) framework as useful models for addressing the research questions. The chapter then continues with an in-depth discussion and explanation of results. Next, implications of the study's findings are considered. The chapter concludes by outlining limitations of the study and recommendations for future research.

Effectiveness of Study Design and Garet et al.'s (1999) Framework

Two key findings of this study concern the utility of the research design and the utility of Garet et al.'s (1999) framework as tools in successfully exploring the relationship between professional learning community activities and teacher improvement. Given that a primary aim of the study was to provide information for school leaders about the relationship between professional learning community activities and teacher improvement with a high level of richness and depth, using a case study approach—with the detail and description typically accompanying that research design (Merriam, 1998)—seemed the most logical choice. In addition to choosing a specific research design, an important step in the development of this study was the selection of an appropriate framework for exploring and describing the relationship between professional learning community activities and teacher improvement. Garet et al.'s (1999) framework of professional development features offered many advantages in this

respect, but there were nevertheless no assurances that this framework would prove both useful and insightful. This section will address the utility of these two tools of the study, dealing first with the study design and secondly with Garet et al.'s (1999) professional development framework.

Efficacy of Case Study Design

The case study design proved to be particularly effective in studying the relationship between professional learning community activities and teacher improvement at Central Middle, especially given that the case study incorporated multiple types of quantitative and qualitative data. The opportunity to focus in-depth on a particular phenomenon allowed for rich analysis and description, and the ability to explore trends across the school through survey data and then drill down on those trends through interview data supported the validity and reliability of the findings. At the same time, however, the unique nature of the case study made generalization of the findings problematic.

One of the strengths of the study design proved to be the mixed method approach. Quantitative data revealed clear trends in PLC activities across the entire population and within subgroups, but it also raised questions and suggested possible inconsistencies. The qualitative data served to corroborate trends suggested by the survey data, to provide depth and context to those trends, to address and help make sense of inconsistencies, and to illuminate patterns that were missed by the survey. As one example, the negative relationship in survey data between collective participation and teacher outcomes was belied by interview data that suggested a clear positive relationship between collective

work and teacher improvement. Finally, the document data corroborated larger patterns, while also providing an objective counter-point to interview data. Overall, all three types of data confirmed the general patterns that emerged, which included a strong relationship between PLC activities and teacher improvement, variations in the nature of PLC activities across grade levels, and a disparity between the 8th grade and 6th and 7th grades in terms of both PLC activities and outcomes.

While the case study design provided a deep understanding of the relationship between PLC activities and teacher improvement at Central Middle, one disadvantage to this approach is that it limits the generalizeability of the findings. That is, because of the unique nature of the individual test site, the findings are limited to the context of the case under study. Nevertheless, given the study's exploratory nature, the depth of information provided by the case study approach was well worth its limiting scope.

Efficacy of Garet et al.'s (1999) Professional Development Framework

Garet et al.'s (1999) professional development framework provided important insights into the nature of professional learning community activities and their relationship to teacher improvement at Central Middle. While Garet et al.'s (1999) framework did not prove to be comprehensive in its descriptive power, it was illustrative in important ways. First, the framework proved successful in identifying broad trends about the nature of professional learning community activities across the core academic faculty and within sub-groups. Second, Garet et al.'s (1999) framework exposed differences in sub-group PLC activities that helped to explain the disparities in teacher outcomes. Third, by using Garet et al.'s (1999) framework and national survey data, it is

possible to place Central Middle's PLC activities into a larger context and compare the efficacy of those activities to more traditional professional development practices. At the same time, while Garet et al.' (1999) framework was effective in many ways, the framework nevertheless included several shortcomings.

In both the Teacher Activity Survey and interviews, Garet et al.'s (1999) professional development features were useful in exploring the nature of professional learning community activities. Survey data suggested that PLC activities involved high levels of collective participation, a minimal focus on content knowledge, multiple opportunities for active learning, and high degrees of coherence. Interview data corroborated these trends, while also providing nuance and depth. Sub-group disparities—such as the differences in coherence across the grade levels—also held true in both the survey and interview data. Overall, Garet et al.'s (1999) features provided natural and effective categories for describing and exploring the nature of the PLC activities.

Garet et al.'s (1999) framework also proved helpful in uncovering both commonalities and differences across teacher sub-groups. One important trend was the lack of differences across subject-area lines and across years of teaching experience: with a few minor exceptions, teachers of different subjects and teachers with differing years of experience reported similar experiences and outcomes for PLC activities. In terms of differences, the most striking sub-group split occurred along grade level lines, in which 6th and 7th grade teachers indicated consistently higher incidences of most of Garet et al.'s (1999) professional development features and outcomes than did 8th grade teachers, an observation that was true in both the Teacher Activity Survey and the interviews. The

framework also helped to provide nuance to sub-group disparities: possible differences in interpretation of "collective participation", uneven levels of focus on the use of technology in instruction, and subject-specific splits in terms of content focus suggested complexities underlying the larger school and sub-group trends.

Finally, because Garet et al.'s (1999) framework was used in the collection of national survey data, it is possible to compare the features and outcomes of Central Middle's PLC activities to the features and outcomes of more traditional professional development practices. It is important to note that, because Central Middle was a first year school with many organizational advantages—a popular and experienced principal, a new faculty, a student body with low percentages of economically disadvantaged students—one would expect Central Middle to be exceptional in many respects when compared to a national sample of schools. Nevertheless, comparisons between the features and outcomes of professional learning community activities at Central and the features and outcomes of professional development from Garet et al.'s (1999) national sample uncovered important differences and similarities. In several areas, Central's PLC activities displayed significantly high levels of Garet et al.'s (1999) features, most notably in the areas of collective participation and active learning. This finding corroborates DuFour's (2004b) definition of a professional learning community as an organization with a significant emphasis on active collaboration among teachers. The high levels of change in terms of knowledge, skills, and instructional practices, especially in comparison to national data, also corroborate DuFour's (2004a) contention that teachers, through participation in PLC activities, "are engaged in the kind of professional development that builds teacher capacity and sustains school improvement" (p.63).

Nevertheless, the similarities between Central Middle's data and Garet et al.'s (1999) national data also shed light on the relationship between PLC activities and teacher improvement. For example, 8th grade teachers indicated changes in knowledge, skills, and teaching practices that were similar to those of Garet et al.'s (1999) national sample (whereas 6th and 7th grade teachers indicated much greater levels of change in these areas) even though the 8th grade teachers had identified levels of collective participation and active learning that were well above those of the national sample. Another similarity between Central's data and Garet et al.'s (1999) data is the relationship between levels of coherence and changes in knowledge, skills, and teaching practices: in both cases, these relationships were strong in a positive direction. This finding suggests that, even when PLC activities bore the expected traits of collaboration and teacher activity (which was true for all three grade levels), they still required a high level of coherence to have an impact on teacher outcomes, which was also true of the more traditional professional development activities represented in Garet et al.'s (1999) study.

Although Garet et al.'s (1999) framework proved to be quite successful in exploring and describing the nature of professional learning community activities, there were two important shortcomings of the framework. The first shortcoming related to the ways in which the scores for each professional development feature were calculated on the survey. Active learning, for example, was essentially an additive feature: teachers were asked whether or not a certain characteristic was true of PLC activities (such as whether or not student work was reviewed by colleagues), but they were not asked to identify the extent to which the characteristic was true. In contrast, the professional

development feature coherence *was* calculated as a measure of depth. As an example, respondents did not simply indicate whether or not PLC activities were consistent with individual professional development goals (one of the coherence sub-components) in a binary yes/no fashion, they instead indicated on a 5-point scale the extent to which that particular sub-component was evident. While any quantitative representation of complex behaviors is bound to include certain shortcomings and compromises in the name of supplying descriptive numbers, the disparity between the calculations for coherence (using a scale of depth) and several of the other features (which were additive in nature) represents a challenge to the reliance on Garet et al.'s (1999) professional development framework.

The second shortcoming of Garet et al.'s (1999) framework related not to what it identified or misidentified but to what it missed. A closer reading of the interview data, and comparisons between the survey, interview, and document data, suggested a key component to professional learning community activities that was not included in Garet et al.'s (1999) framework. This additional component, which focused on the development of team community, is discussed in more detail in the next section.

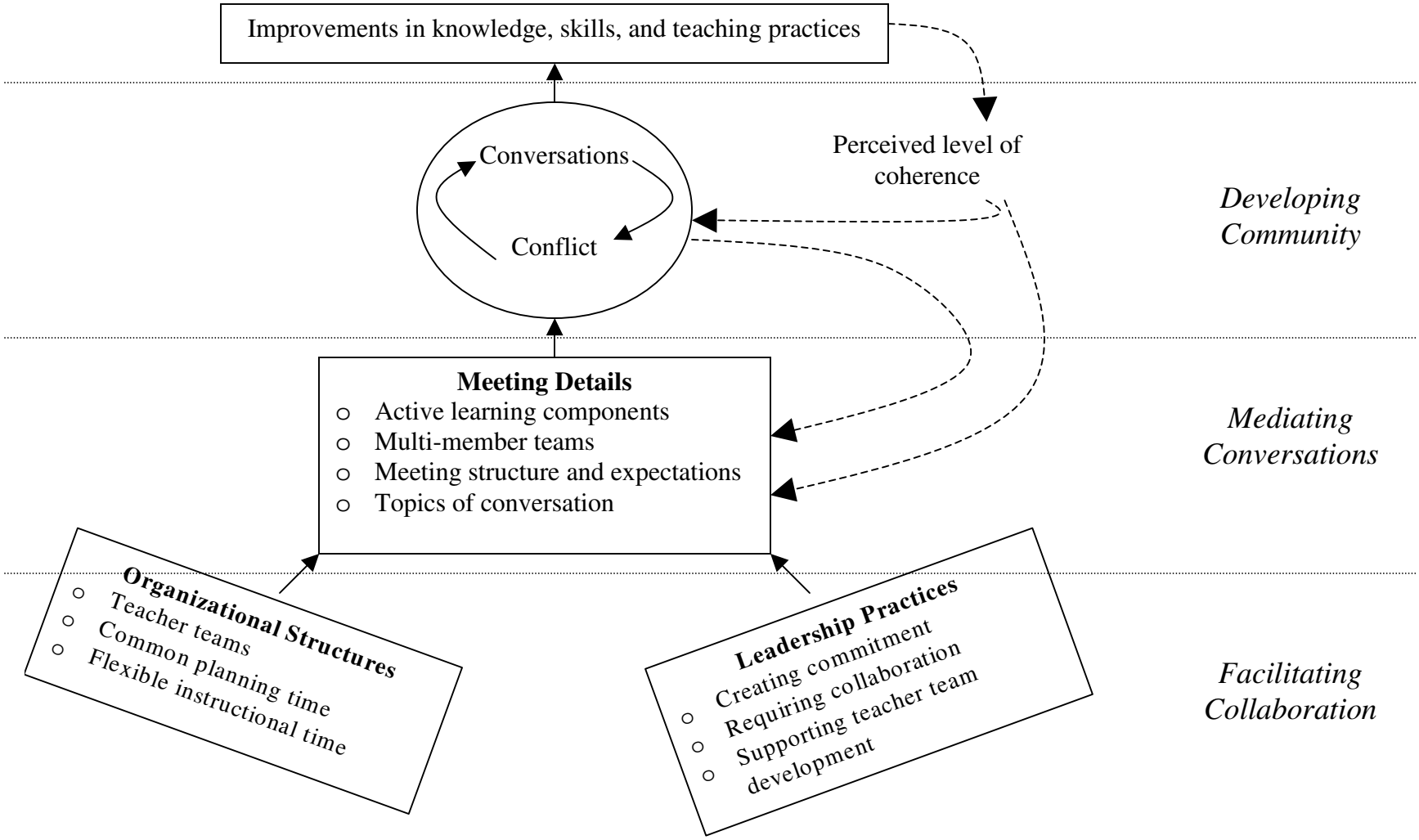
Discussion and Explanation of Results

At Central Middle, a strong positive relationship existed between professional learning community activities and teacher improvement, but this relationship was complex and contingent upon multiple factors at multiple levels. A number of different explanations of that relationship are possible, especially given the range of data collected for this study and the complex nature of schools. Nevertheless, the data suggest a specific

model of hierarchically layered factors. It appears that certain foundational factors—such as common planning time, teacher collaboration required by the principal, and organizational support for teacher team development—created an environment in which PLC activities could contribute to teacher improvement, but these foundational factors were not enough. In addition, the details of professional learning community team meetings—such as the integration of active learning components and the number of PLC members—mattered, but these factors were primarily important in the way that they supported the development of substantive conversations within PLC meetings around issues of teaching and learning. Ultimately, through an iterative process in which PLC conversations both raised and addressed conflict around curricular and instructional practices, it was the extent to which PLC teams were able to develop a level of team community that fostered improvements in knowledge, skills, and teaching practices.

The results of the study are summarized in a model presented graphically in Figure 12. Within this model, three layers of factors describe the relationship between professional learning community activities and teacher improvement. At the first layer, a variety of organizational structures and leadership practices facilitate collaboration. At the next layer, meeting details serve to mediate the substance of teacher conversations. At the third layer, a cyclical process of conversation and conflict support the development of community, which in turn supports changes in knowledge, skills, and teaching practices. The remainder of this section provides detail concerning each of the layers of this explanatory model.

Figure 12: The relationship between professional learning community activities and teacher improvement at Central Middle School



Facilitating Collaboration

The success of the professional learning community structure as an agent of teacher improvement seemed to be interwoven with leadership strategies and organizational structures in a way that was both ubiquitously evident and difficult to disentangle. Interviewees spoke across the board of the importance of common planning time and the powerful impact that the principal had on the character and nature of the school. As one 6th grade teacher put it, "I attribute it all to [the principal] because of the people he hired, setting those standards and those goals for us at the very beginning, making sure we understood what was to be expected of us." Nevertheless, data from the Teacher Activity Survey suggest that leadership and organizational factors were not the chief variable in the relationship between PLC activities and teacher improvement; while all teachers spoke to the importance of leadership and organizational strategies in the interviews, the disparity between 8th grade survey results and 6th and 7th grade survey results suggests that much more was at play. That is, each grade level in the building benefited from the same schedule, the same leadership, and the same structured collaborative opportunities, but not all grade levels indicated the same level of improvement. Instead, organizational structures and leadership practices served to create a foundation for collaboration within the school, working primarily in a facilitative, rather than causal fashion.

The important organizational structures at Central Middle included the development of teacher teams, which were organized by grade level and content area and would fall under Garet et al.'s (1999) definition of collective participation; the creation of a schedule that provided significant common planning time for grade-level teams; and the

use of a block schedule, which allowed for flexible instructional time that then supported later changes in instructional practices. The important leadership practices included an emphasis on the importance of teacher commitment to student learning and collaboration, which at Central was really a collection of strategies such as hiring practices, content of faculty meetings, the use of internal staff surveys, and others; requiring teacher collaboration, which included both the expectation that teachers would develop common assessments and the regular review of and participation in teacher collaborative meetings by administrators; and supporting teacher team development, which included both formal and informal strategies, such as bringing in an outside consultant at several points to meet with teacher teams and using public and private forums to emphasize the principal's commitment to collaboration.

Therefore, while organizational structures and leadership practices were critical pieces in the relationship between PLC activities and teacher improvement, they were only part of the puzzle. The organizational structures ensured that teachers were grouped into common teams and had the necessary time available to collaborate. The leadership practices helped to set a direction for the school and reinforce a commitment to PLC principles. Nevertheless, while these structures and practices helped to facilitate collaboration, they were only one factor in the complex relationship between professional learning community activities and teacher improvement.

Mediating Conversations

Once the structural and leadership practices were in place to facilitate collaborative practices, the next factor in the relationship between PLC activities and

teacher improvement was the nature of professional learning community team meetings and the way in which the details of those meetings served to mediate, either positively or negatively, the substance of PLC conversations. The key components of those meetings appear to have been the types of activities in which teachers engaged, which corresponds to Garet et al.'s (1999) definition of active learning components; the composition of PLC teams, especially concerning the number of participants; the way in which meetings were structured, particularly meeting rules, roles, and participant responsibilities; and the topic of conversations, which relates to Garet et al.'s (1999) definition of focus on content.

Active learning emerged as one of the most important features of PLC team meetings, especially through interviews. While the Teacher Activity Survey only addressed active learning components in a binary yes/no fashion (i.e., was the component part of PLC activities or wasn't it), teacher interview data show that active learning opportunities were of particular importance for teachers, and that the depth of these activities mattered. PLC activities incorporated significant amounts of group dialogue, and this dialogue was typically driven by active learning components: developing lesson plans, reviewing student work, scoring assessments, and others. While teachers at all grade levels indicated that they participated in active learning components, 6th and 7th grade teachers mentioned a depth to active learning that was not evident at the 8th grade. As an example, while an 8th grade teacher described active learning components in relatively superficial terms—"[we would] swap ideas, talk about where we are in curriculum, sharing some instructional materials"—a 6th grade teacher described active learning components as having considerably more depth:

> We would have weekly meetings where we would plan out our lessons for the week, we would also speak and reflect with peers. We all had common assessments, common lessons, we all taught the same lessons. We all take our previous knowledge and our previous work that we had done on a particular unit, bring that to the table, talk about best practices that we had used, then we all used each others' activities and ideas to try it out. And also we reflected afterwards how we felt about activities and units, how well students had done, we did pre and post assessments to chart student growth—that guided our instruction.

In addition to differences in active learning, the composition of PLC teams, the structure of team meetings, and the topics of conversation represented key differences between 8th grade PLC teams and 6th and 7th grade teams. At the 8th grade, PLC team meetings had no more than two members, whereas teams at the 6th and 7th grades included between three and five members. Meetings at the 6th and 7th grades also gradually became more structured as the year progressed, with a relatively clear understanding of rules and roles, while meetings at the 8th grade level do not show the same progression. Finally, the topics of conversation at the 6th and 7th grades were more likely to relate directly to issues of teaching and learning, and to deal with these issues in substantive depth, than was true at the 8th grade.

The specific details of PLC team meetings, therefore, had an important influence on the nature of conversations at those meetings. It appears that there was a complex relationship among these meeting details and that the details evolved over time, especially for 6th and 7th grade teams. For example, it appears that several teams created

meeting rules only after conflicts and frustrations emerged, and that these rules were modified at times as the teams developed. In addition, the topics of meetings appear to have changed over time as the teams evolved, moving to increasingly include discussions of student learning and student achievement data as the year progressed. Nevertheless, these meeting details continued to mediate the substance of PLC team conversations, even as those conversations evolved.

Developing Community

At the heart of the professional learning community model is the idea of teams of teachers sitting down together and engaging in substantive conversations about issues related to teaching and learning. Through these conversations, teachers share instructional strategies, make decisions about curriculum and assessment practices, and analyze student achievement data. As a result of these conversations, teachers are then expected to learn from each other and to make improvements in what they teach and how they teach it—as one Central Middle teacher put it, "[I've had] ten times more growth this year than in previous years because I'm seeing things through at least ten other eyes". Implicit in this model is a sense of community among teachers and an effective approach to working within a team. What the Central Middle data reveal is that the process of creating an effective team and building a successful community of teachers that are able to work collaboratively is a difficult and problematic process, but that it is this process that ultimately determined the impact that PLC activities would have on teacher improvement.

Emerging from the Central Middle interview data was a clear disparity between the nature of the teams at the 8th grade versus the nature of the teams at the 6th and 7th grades. Many of the 6th and 7th grade teachers spoke about conflict within their teams and how professional learning community activities often involved negotiation and strong differences of opinion, whereas 8th grade teachers spoke about maintaining individuality and careful consensus. Here are two quotes from 8th grade teachers concerning the nature of their teams and their teams' work:

> [Quote 1] Sometimes it feels like we should do everything the same but some people want to go into teaching because they want to express their own creativity—that shouldn't be forgotten. If you're asked to do something you're not comfortable doing, I don't agree with that—how effective will you be if you don't agree with it?
>
> [Quote 2] With only two in a PLC and we disagree, and you know I know I'm right, you either convince or you give up, and if you really should be teaching one thing and there's just two of you and you disagree, that's hard.

In contrast, the two quotes below describe the work of a 6th grade team and a 7th grade team respectively:

> [Quote 1] Learning to accept the fact that you're not the only one with ideas and that other ideas might be better than yours, it's okay for your idea not to be the best this time, to do the will of the PLC.
>
> [Quote 2] With most groupings of people you're going to have people who tend to dominate and think their way is the right way… having to gently

> get that person to evolve and try other ideas has been a process… we still have to be productive and we still have to get along…having to balance the voices has been a challenge.

This disparity in team dynamics and conflict management has been studied before in school settings. In a comparison case study of two middle schools, Achinstein (2002) examined the micropolitical factors that can affect the development of teacher community. One of the key features that emerged from her study was the way in which teachers managed conflict within teams. According to Achinstein (2002):

> The kinds of organizational learning purported to result from building community among teachers are deeply linked to how they manage the difference amid their collaboration. The processes of conflict are critical to understanding what distinguishes a professional community that maintains stability and the status quo from a community engaged in ongoing inquiry and change. In the cases [from the research study], the micropolitical processes played an essential role in organizational learning that impacted structures, reform efforts, norms, and the whole school community. In one case these processes fostered a kind of learning for inquiry and ongoing renewal through challenging deeply taken-for-granted norms, whereas the other case showed how the community used these process to maintain harmony and the status quo. (p.446)

One important factor in the development and management of conversation and conflict at Central was the size of the teacher teams. At the 6th and 7th grades, each PLC team had at least three members, whereas the 8th grade teams had only two members (or,

in some cases, only one member). And while those two-person teams may have ostensibly engaged in some of the same practices as the 6th and 7th grade teams (such as planning lessons together or discussing student work), the nature of the conversations and the team dynamic were different. The focus at the 8th grade was more on maintaining consensus and smooth working relationships than it was on addressing curricular and instructional issues in substantive, and potentially contentious ways. Based on this fact, it seems that a basic prerequisite for successful PLC teams is a certain number of members. And, in reflecting on the nature of their teams, one 8th grade teacher commented on this fact: "When there are only two in your PLC, there need to be more… the PLC needs to be bigger so you can have a majority."

Grossman et al. (2001) also explored the idea of teacher community and the spectrum along which the concept of "community" can exist. Grossman et al. (2001) worked with a group of high school teachers and attempted to create a professional community over a multi-year time span. What the researchers found was that the teachers went through multiple stages in building their community, moving from what the authors termed "pseudocommunity" to a more substantive and effective team. Once again, the subject of conflict was at the center of team formation. According to the authors:

> As community starts to form, individuals have a natural tendency to *play community*—to act as if they are already a community that shares values and common beliefs… This is called 'pseudocommunity'… The maintenance of pseudocommunity pivots on the suppression of conflict. Groups regulate face-to-face interactions with the tacit understanding that it is 'against the rules' to challenge others or press to hard for clarification.

> This understanding paves the way for the *illusion of consensus*. Because there is no genuine follow-up, conversation partners are able to speak at high levels of generality that allow each to impute his or her own meaning to the group's abstractions. For example, if notions of ' critical thinking' or 'interdisciplinary curriculum' are never defined, every discussion member can agree to this common cause without giving it so much as a second thought. (p.955-956, italics in original)

The development of a true professional learning community at Central Middle, along with the realization of the teacher improvement benefits that accompanied that development, was therefore predicated upon a cyclical process of substantive conversation and conflict that appears to have emerged within the 6th and 7th grade teams, but not within the 8th grade teams. And, as a sense of team community began to develop as a result of that process, two outcomes emerged. First, the development of community created a feedback loop back to meeting details (indicated in Figure 12 by a dotted line); for example, as conflict arose, the teams developed new meeting rules to deal with conflict constructively, such as structuring rules for verbal participation in meetings, and these changes in turn supported deepening levels of community.

Second, and more importantly, as teams began to develop a sense of community, this created opportunities for teachers to learn from each other. In almost all cases, interview data revealed that the greatest reason given for growth and improvement within professional learning community teams was other team members. That is, as individual teachers grew to trust and respect each other, and as conversations increasingly addressed substantive issues of teaching and learning, teachers were able to "see through each

other's eyes" such that each member of the team was able to benefit from the collective wisdom of all members. This process appears to have been frustrating and difficult, and not without its setbacks as the year progressed, but it appears to have had a substantive impact on teacher improvement. And, as team members gained in knowledge and skills, and gradually changed their teaching practices, they became more likely to perceive PLC activities as aligning with their own individual goals and needs, which Garet et al. (1999) would define as coherence. These improvements and perceived levels of coherence then created feedback loops to both the details of meetings and to the substance of conversations (indicated on page 149 in Figure 12 by dotted lines). As teachers perceived themselves as improving, they increasingly focused their conversations on substantive issues of teaching and learning and they redesigned their meeting structures to facilitate those conversations.

Implications of the Study

The title of this study suggests that the professional learning community model can be seen as a reconceptualization of teacher professional development. While the story of Central Middle School's first year is one of complexity and nuance, it is also a testament to the possibilities of PLC principles as a vehicle for teacher and school improvement. In many ways, Central Middle represents a best case scenario for the development of a professional learning community—an experienced principal with a clear vision, a new faculty, a student body from predominately advantaged backgrounds—and although no one school's circumstances are directly generalizeable,

the lessons learned at Central Middle are nevertheless important for other school leaders interested in the use of the professional learning community structure. Especially for middle school leaders and for school leaders in first-year schools, Central Middle's story has important implications. This section will explain those implications, focusing specifically on three areas: the possibilities of the PLC model as a site-based tool for teacher improvement, the importance of school leadership in facilitating PLC success, and the critical role of conversation and conflict in determining the efficacy of PLC activities.

Using the PLC Model As a Site-Based Tool For Teacher Improvement

At Central Middle, the primary strength of the professional learning community model was the way in which it opened up opportunities for teachers to learn from other teachers within the building. This represents a departure from more traditional professional development, in which the expertise commonly comes from the outside (Sparks, 1994). In addition, the professional learning community activities at Central represented the school's primary professional development approach; that is, formal professional development time at Central was dedicated almost solely to PLC activities, with little time invested in more traditional professional development opportunities. And, for most of the core academic teachers at Central, learning from each other was more professionally rewarding and effective than their previous experiences in more traditional professional development had been. This finding has important implications for school leaders looking for ways to improve teaching practice: before looking to the outside, start by looking within.

This approach—looking to spread expertise and innovation that already exists within the building—is sometimes called positive deviancy. In an interview with Dennis Sparks (2004), Jerry Sternin defined positive deviants as "people whose behavior and practices produce solutions to problems that others in the group who have access to exactly the same resources have not been able to solve". In other words, within any organization there will be individuals who exhibit behaviors that result in better-than-average results (or, more aptly said, in any school there will be teachers who use teaching practices that result in better-then-average student learning). Sternin's description of positive deviancy is based on his own work conducting nutrition research in Vietnam. In the early 1990s, Sternin and Robert Choo, both with Save the Children, were attempting to address high levels of malnutrition among children in Vietnam. Rather than bringing in a pre-fabricated program or solution, Sternin and Choo looked for examples of families whose children were not malnourished. They then attempted to identify how these exceptional families were successful, even though these families lived in the same conditions and suffered from the same levels of poverty as other families with malnourished children. Sternin and Choo found that the successful families were supplementing their diets with a variety of foods—such as shrimps, crabs, and sweet potato greens—that were easily and freely found in the local rice paddies. While these were not foods typically fed to children, Sternin and Choo latched onto these successful practices, and they were able to create opportunities for the successful families to spread these practices throughout their villages. (Sternin and Choo, 2000)

In Sparks' (2004) interview with Sternin, the two talk about ways in which the idea of positive deviancy might be applied to schools. One challenge they discuss is

having the underlying structure in place within a school to allow for the successful transfer of effective teaching practices from one teacher to another. At Central Middle School, the professional learning community structure served to facilitate the types of open, substantive conversations about teaching and learning that Sparks and Sternin identify as contributing to the spread of positive deviancy. In other words, for middle school principals looking for a way to improve teaching practices throughout a school, the professional learning community structure lays the groundwork for spreading the expertise and effective practices found in existing, isolated classrooms to other classrooms throughout the school. Rather than having to look to the outside for models of effective teaching, principals can build on the knowledge and practices that already exist within their own buildings.

Implementing Leadership Efforts at Multiple Levels

Getting teachers to a point at which innovation and practice can spread, however, requires work from building leaders at multiple levels. Another clear finding from Central Middle was that, even under the best of circumstances, developing a successful professional learning community is difficult work and requires organizational and leadership strategies that are both foundational and ongoing. For middle school leaders or leaders in first-year schools, Central Middle teaches that effective leadership is indispensable in the creation of a professional learning community.

Central Middle teachers spoke universally to the importance of leadership efforts in the successful development of a professional learning community. As was shown in the model in Figure 12, the principal's efforts translated into both organizational

structures (e.g., teacher teams, common planning time) and ongoing leadership strategies (e.g., creating teacher commitment, requiring teacher collaboration). According to this study's findings, these efforts were critical both in terms of planting the foundational seeds that allowed a professional learning community structure to take root, and in terms of nurturing and feeding the PLC as it gradually grew and developed. For school leaders interested in developing a professional learning community, there are two important lessons here: first, that foundational structures must be in place to facilitate the development of a PLC; and second, that ongoing work is critical to the growth of successful practices. And, within these two areas, there is a constant tension between leader-required directives and distributed decision-making.

At the root level, school leaders must recognize that form follows function. In other words, in order for collaboration and conversation to take place, teachers must have time to regularly meet and work collaboratively, and teachers must be organized into various teams of multi-member (i.e., more than two) composition. In addition, while teams should be given latitude in terms of decision-making power (e.g., making substantive curricular and instructional issues), they must also be given clear direction and expectations concerning the substance of their collaboration. At Central Middle, teachers were required to meet on a weekly basis in same-grade, same-subject teams, they were given 90-minute common planning blocks each day, and they were required to administer common assessments on at least a quarterly basis. While this study did not speak to the relative merits of different team configurations (e.g., grade-level versus subject area), the necessary frequency of meetings, the length of meeting times, or the specific requirements for teams, it was clear that having a structure that supported

collaboration was important, and that balancing directives with team autonomy was a recurrent theme.

In addition to planting the foundational seeds, the Central Middle principal also tended to the development of PLC teams. From this study, it is unclear exactly what strategies the principal used in this area, but borrowing from Achinstein's (2002) work, it seems apparent that school leaders must attend to the micropolitics of teacher teams. And here again there existed a tension between imposed direction and flexible autonomy—at Central, some teachers indicated that they appreciated extreme flexibility in team-based decision-making, whereas other teachers spoke to a greater need for administrative direction. This study does little to address the proper role of administrators in this type of collaborative culture—this is an area in which additional research would be valuable.

And, if the above paragraphs appear to present daunting requirements for school leaders interested in developing a professional learning community, it begs the question as to whether or not a PLC structure might be possible in any type of school environment or with any type of school leader. The tension between administrative direction and team autonomy was described in fragile terms by Central Middle teachers, and it is possible (and maybe even likely) that many school leaders would find it difficult to maintain this balance in an effective and productive way. For school leaders interested in the PLC structure, and for school districts interested in implementing professional learning communities at local schools, there are clear implications for leadership development. The PLC model represents a departure from more traditional, hierarchical management techniques, and more research is needed in the types of training and skills necessary on

the part of building principals to successfully implement the professional learning community model.

Encouraging and Balancing Conversation and Conflict

Finally, the story of Central Middle suggests that, even under the best of circumstances, the PLC model will not necessarily lead to exceptional teacher improvements. At Central, the PLC structure was really about facilitating substantive, collaborative, ongoing conversations among teachers about issues of teaching and learning, and while the PLC structure may have increased the likelihood that those types of conversations would take place, by no means did PLC activities ensure that they would. Before those conversations could take place, teachers needed to first develop a sense of community, and the process of building that community was both complex and circuitous. This finding brings to mind an earlier quote by Pascale et al. (2000): "Living systems cannot be *directed* along a linear path. Unforeseen consequences are inevitable. The challenge is to *disturb* them in a manner that approximates the desired outcome." (p.6, emphasis in original) In other words, the development of community was an organic and delicate process that depended upon a balance of clear requirements and open flexibility from school leadership, negotiation of personalities within teacher teams, a sense of coherence between PLC activities and individual goals, and the development of new skills in the area of teamwork and collaboration.

All of this is to say that, while professional learning community activities appeared to be successful in many respects at Central Middle, that success was never assured and the process was difficult. Conflicts clearly arose—and these were conflicts

alien to most of Central's teachers, who had typically not been required to work in such close collaboration with colleagues—and teachers needed to develop new skills and attitudes to deal with those conflicts. At schools interested in the PLC model, it is likely that both teachers and administrators would need to develop skills in building and supporting effective teams, and in dealing with conflict productively. And, because Central Middle was a first-year school, the faculty and school leadership did not have the additional challenge of addressing an existing culture that may have been hostile to collaboration and open conversations. For existing schools interested in developing a professional learning community structure, the findings of this study should be taken with an especially large grain of salt. The types of training necessary to prepare teachers and administrators for substantive teamwork and collaboration, along with the challenges of attempting to convert an existing school into a professional learning community, are important areas in which more research would be beneficial.

Recommendations for Future Research

Two of the study's limitations were its use of teacher perception data in measuring teacher improvements and its lack of student achievement data. Conducting a similar study that incorporated additional measures of teacher improvement (e.g., classroom observations) and student achievement data (e.g., standardized testing data) would strengthen any claims concerning the efficacy of the professional learning community model. In addition, by including data on student achievement, it would be possible to investigate whether or not the PLC structure extends beyond improvements in

teaching practices to improvements in student learning, which would provide a more concrete rationale for either implementing or not implementing the PLC model.

This study focused on the development of a professional learning community at a first-year school—researchers should consider exploring the relationship between PLC activities and teacher improvement at schools that choose to integrate professional learning community principles into an existing, non-PLC culture. Because most principals work in existing schools, rather than having the opportunity to open a new school (and, in Central Middle's case, a school built from scratch around PLC principles), it would be important to note the ways in which development of a PLC in an existing culture could enhance, retard, or simply alter the PLC model's relationship to teacher improvement, and to understand the factors underlying that relationship. Furthermore, this study focused on a middle school serving students from predominately-advantaged backgrounds. Additional research would be needed to see how the findings of this study extend to elementary or high schools, and to schools serving less advantaged students: if the success of the PLC model as an agent of teacher improvement is limited by the level of school in which it is implemented, or by the socio-economic background of the school's students, this would suggest a serious shortcoming.

Additionally, Central Middle's schedule was built to accommodate high levels of collaboration and instructional flexibility, with 90-minute blocks that allowed significant time for PLC teams to meet and for teachers to experiment with various instructional techniques. While the block schedule was cited by study interviewees as an important factor in the success of the PLC structure, this study did not directly address the impact of a block schedule on the efficacy of a PLC structure. Additional research could more

explicitly examine how the development and maintenance of a professional learning community is impacted by various instructional schedules.

Finally, this study's findings included a model describing the relationship between professional learning community activities and teacher improvement at Central Middle School. Another recommendation for future research would be to explore and evaluate this model. Is the model unique to Central, or does it have elements in common with other schools organized around professional learning community principles? One possible opportunity for research would be to operationalize the model and apply it to other schools, using the model as a framework for evaluating the relationship between PLC activities and teacher improvement in other settings. In addition, the model for Central Middle suggested the importance of foundational leadership practices in supporting teacher collaboration, but the specific practices employed at Central were only described in superficial terms. A more in-depth exploration of the leadership strategies necessary for encouraging and supporting teacher collaboration at either new or existing schools would be of particular benefit to school leaders interested in developing a professional learning community model, or to district leaders interested in developing leaders who could institute PLC principles.

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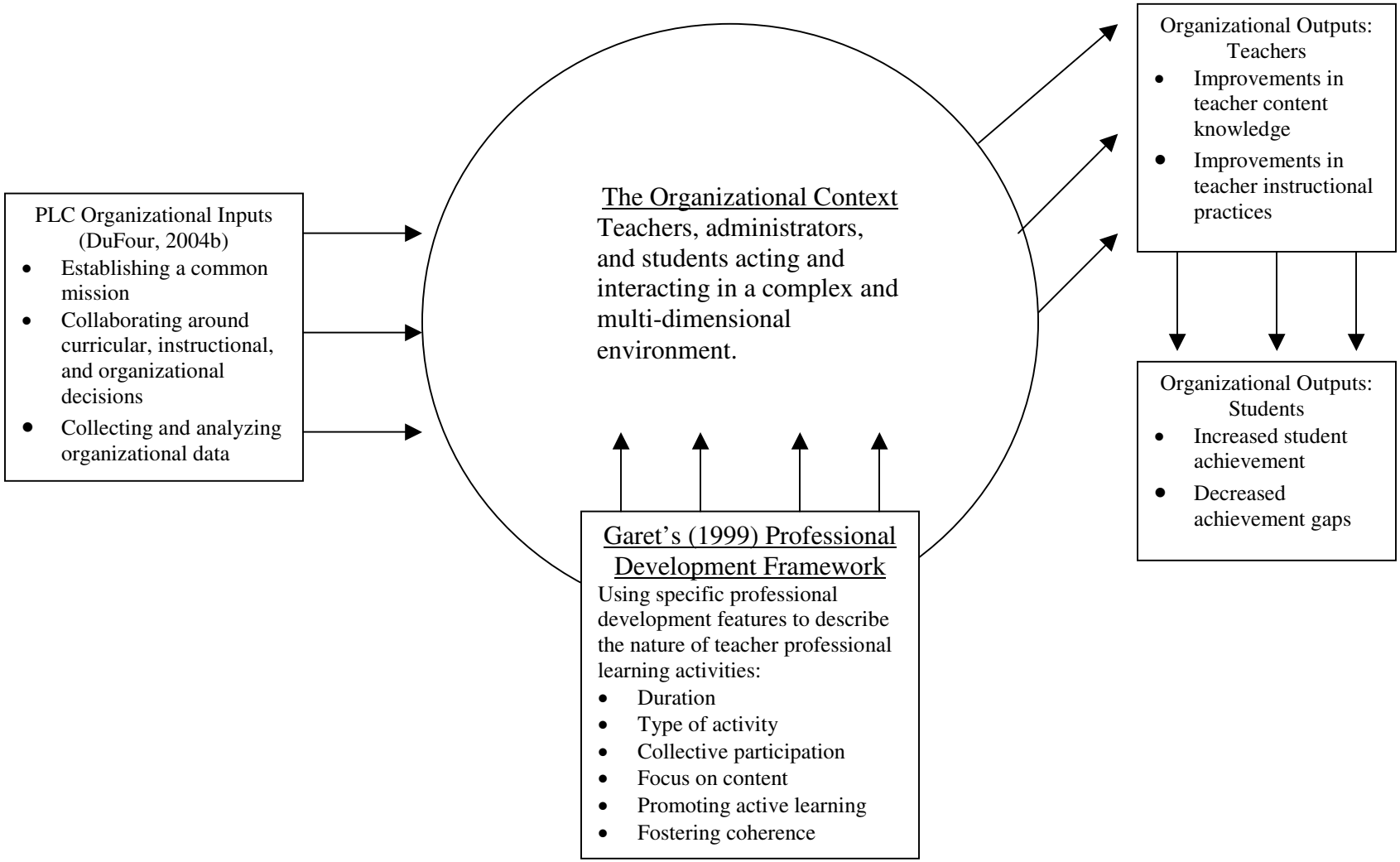
Appendix A: Theoretical model of the relationship between professional learning community organizational strategies and teacher improvement



Appendix B: Professional Learning Community Site Selection Protocol

Rick DuFour initially outlined his vision of a professional learning community in the book *Professional Learning Communities at Work: Best Practices for Enhancing Student Achievement* (DuFour & Eaker, 1998). In that book, the authors identified six essential characteristics of a PLC:

1. Shared mission, vision, and values
2. Collective inquiry
3. Collaborative teams
4. Action orientation and experimentation
5. Continuous improvement
6. A results orientation

More recently, DuFour worried that "the term [professional learning community] has been used so ubiquitously that it is in danger of losing all meaning" (DuFour, 2004b, p.6). To more clearly define the heart of the PLC concept, DuFour boiled down the original six characteristics to three "big ideas" that he believes "represent the core principles of professional learning communities" (DuFour, 2004b, p.6): ensuring student learning, developing a culture of professional collaboration, and focusing on results.

The proposed study will focus on a middle school that has faithfully implemented DuFour's (2004b) three "big ideas" and therefore meets the definition of a functioning professional learning community. In identifying an appropriate site for the proposed study, teacher interview and school document data will be analyzed to determine the fidelity of implementation of DuFour's (2004b) principles. The following tables summarize the guiding principles and practices related to DuFour's (2004b) three

principles; identify anticipated teacher and organizational behaviors and artifacts that would suggest faithful implementation of DuFour's (2004b) three principles; and outline the proposed data collection activities and processes necessary to evaluate the fidelity of implementation of DuFour's (2004b) principles.

PLC "Big Idea" #1: Ensuring that students learn

Guiding Principles and Practices (DuFour, 2004b)	Examples of Anticipated Behaviors or Artifacts	Data Collection Activities and Processes
▪ Ongoing individual and organizational reflection on best practices for student achievement ▪ Collaborative identification of expected learning standards ▪ Collaborative creation of assessments tied directly to learning standards ▪ When students	▪ Regular (i.e., weekly or monthly) discussions of curricular objectives and effective instructional practices at faculty sub-group and whole-group meetings ▪ Curriculum maps or written curriculum sequences ▪ Formal written student intervention	▪ Interview teachers concerning the substance of faculty whole-group and sub-group meetings ▪ Interview teachers concerning individual and organizational responses to under-performing students ▪ Review department or sub-group curriculum and assessment

demonstrate a lack of proficiency relative to identified learning standards, individual and organizational response is timely, based on intervention rather than remediation, and directive	plans ▪ Regular faculty sub-group discussions of student academic progress ▪ Documentation of under-performing students and subsequent academic interventions ▪ Common assessments	documents ▪ Review formal school academic intervention plans

PLC "Big Idea" #2: A culture of collaboration

Guiding Principles and Practices (DuFour, 2004b)	Examples of Anticipated Behaviors or Artifacts	Data Collection Activities and Processes
▪ Regular team-based collaboration focused on analysis and improvement of classroom practices and student learning	▪ Lists of essential academic outcomes ▪ Teacher teams organized by grade level and/or subject areas	▪ Interview teachers concerning the substance of faculty whole-group and sub-group meetings ▪ Interview teachers

▪ Universal staff membership on teams focused on student learning ▪ Structured time during the school day for team meetings ▪ Clear norms and protocols concerning roles, responsibilities, and relationships among team members ▪ Regular collaborative conversation focused not just on issues of teaching but also on issues of student learning	▪ Regular (i.e., weekly or monthly) team-based meetings focused on the development of curriculum and assessments ▪ Regular (i.e., weekly or monthly) team-based meetings focused on effective instructional practices and student mastery of curriculum standards ▪ Common assessments ▪ Formal lists of team norms, protocols, and responsibilities	concerning the norms, protocols, and responsibilities evident in faculty whole-group and sub-group meetings ▪ Review department or sub-group curriculum and assessment documents ▪ Review department or sub-group meeting notes and descriptions of meeting practices

PLC "Big Idea" #3: A focus on results

Guiding Principles and Practices (DuFour, 2004b)	Examples of Anticipated Behaviors or Artifacts	Data Collection Activities and Processes
▪ Development of common formative assessments across teacher teams ▪ Regular and ongoing analysis of student performance data ▪ Clear goals for student learning and regular comparison of student performance data against learning goals ▪ Use of student assessment data to drive collaborative conversations focused on student learning and best	▪ Lists of essential academic outcomes ▪ Common assessments ▪ Regular (i.e., weekly or monthly) team-based meetings focused on analysis of student performance data ▪ Regular (i.e., weekly or monthly) team-based meetings focused on effective instructional practices and student mastery of curriculum standards ▪ Regular faculty sub-	▪ Interview teachers concerning the substance of faculty whole-group and sub-group meetings ▪ Interview teachers concerning the level of inclusion in faculty whole-group and sub-group meetings ▪ Review department or sub-group curriculum and assessment documents, including any analyses of student performance ▪ Review department

practices ▪ Universal access to team ideas, materials, strategies, and talents	group discussions of student academic progress ▪ Focus on inclusion of all group members in both faculty conversations and whole-group or sub-group meetings	or sub-group meeting notes and descriptions of meeting practices

Appendix C: Professional Learning Communities Survey

The following survey is intended to gather data about the nature and effectiveness of professional learning community activities in which you participated over the course of the 2004/2005 academic year. **For all questions, please consider professional learning community activities related to the primary subject area that you taught over the course of the 2004/2005 academic year.** Please return your completed questionnaire in the stamped, self-addressed envelope that has been provided.

Also, as a reminder, your participation in this study is voluntary. Should you wish not to complete the survey, it is your right to refuse to do so.

Section 1: Participant Data

1. Please indicate the primary grade level at which you taught during the 2004/2005 academic year (please select only one):

6th Grade ☐

7th Grade ☐

8th Grade ☐

2. Please indicate the primary subject area that you taught during the 2004/2005 academic year (please select only one):

Language Arts ☐

Mathematics ☐

Science ☐

Social Studies ☐

3. Please indicate the total number of years of teaching/education experience that you had at the end of the 2004/2005 academic year:

0-3 years ☐

4-10 years ☐

10+ years ☐

Section 2: Professional Learning Community Activities

1. Which of the following best describes the nature of the professional learning community activities in which you participated during the 2004/2005 academic year? **Choose only one response**. If more than one response fits the activity, pick the response that best describes the aspect of the activity in which you spent the most time.

Participation in an in-district workshop or institute	a
Attendance at a college course	b
Attendance at an out-of-district workshop or institute	c
Participation in a teacher collaborative or network	d
Attendance at an out-of-district conference	e
Working in an internship or immersion activity	f
Working with a mentor, coach, lead teacher, or observer	g
Use of a teacher resource center	h
Participation in a teacher committee or task force	i
Participation in a teacher study group	j
Other (please specify	k

2. How did professional learning community activities during the 2004/2005 academic year help you use new skills in your classroom? (Circle all that apply.)

Practiced under simulated conditions, with feedback	a
Received coaching or mentoring in the classroom	b
Met formally with other activity participants to discuss classroom implementation	c

My teaching was observed by the activity leader(s)/administrators and feedback was provided	d
My teaching was observed by other participants and feedback was provided	e
Communicated with the leader(s) of the activity/administration concerning classroom implementation	f
My students' work was reviewed by participants or the activity leader/administration	g
Met informally with other participants to discuss classroom implementation	h
Developed curricula or lesson plans, which other participants or the activity leader/administration reviewed	i
Other (specify)	j

3. Over what period of time were professional learning activities spread, including any main activities and any formal preliminary or follow-up sessions? (Circle one response.)

Less than one day	a
One day	b
Two-four days	c
A week	d
A month	e
More than a month	f

4. In what month or months did professional learning community activities (including any preliminary or formal follow-up sessions) take place? Check the appropriate month(s) on the timeline below.

Before June 2004	June 2004	July 2004	Aug. 2004	Sept. 2004	Oct. 2004	Nov. 2004	Dec. 2004	Jan. 2005	Feb. 2005	March 2005	April 2005	May 2005	June 2005

5. Between June 2004 and June 2005, how many hours were you engaged in professional learning community activities overall?

_____hours

6. Are the activities still continuing?

Yes..... 1

No..... 2 (skip to question 8)

7. How many hours do you expect to be engaged in this activity between now and the end of the school year?

_____hours

8. How much emphasis did professional learning community activities during the 2004/2005 academic year give to each of the following areas?

	No	Minor	Major

	Emphasis	Emphasis	Emphasis
a. Curriculum (e.g., units, texts, standards)	0	1	2
b. Instructional methods	0	1	2
c. Approaches to assessment	0	1	2
d. Use of technology in instruction (e.g., computers, graphing calculators)	0	1	2
e. Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)	0	1	2
f. Deepening your knowledge of your subject area	0	1	2
g. Leadership development	0	1	2
h. Other: (please specify	0	1	2

9. Which of the following characterize the participants in professional learning community activities during the 2004/2005 academic year? (Circle all that apply.)

Teachers as individuals	a
Teachers as representatives of their departments, grade level, or school	b
All teachers in department or grade-level groupings	c
All teachers in the school	d
Other configurations (specify)	e

10. Which of the following did you engage in during professional learning community activities during the 2004/2005 academic year? (Circle all that apply.)

Listened to a lecture	a
Observed a demonstration of a lesson or unit	b
Participated in a whole-group discussion	c
Participated in a small-group discussion	d
Gave a lecture or presentation	e
Conducted a demonstration of a lesson, unit, or skill	f
Led a whole-group discussion	g
Led a small-group discussion	h
Engaged in extended problem solving	i
Wrote a paper, report or plan	j
Practiced using student materials	k
Developed or reviewed materials	l
Reviewed student work	m
Scored assessments	n
Collaborated as a colleague with professionals in my subject area (e.g., mathematicians, scientists, historians, etc.)	o
Used technology (computers, calculators, or the internet)	p
Completed paper-and-pencil problems or exercises	q
Assessed participants' knowledge or skills	r
Other: (please specify)	s

11. Did you discuss what you learned during the 2004/2005 academic year with other teachers in your school or department *who did not attend* the activity?

Yes..... 1

No..... 2

12. Did you discuss or shared what you learned during the 2004/2005 academic year with *administrators* (e.g., principal or department chair)?

Yes..... 1

No..... 2

13. Outside of formal meetings held as part of professional learning community activities during the 2004/2005 academic year, did you communicate with participants in the activity who teach in other schools?

Yes..... 1

No..... 2

14. To what extent were professional learning community activities during the 2004/2005 academic year:

	Not at all				Great extent	Not applicable
a. Consistent with your own goals for your professional development	1	2	3	4	5	na
b. Consistent with your school's or department's plan to change practice	1	2	3	4	5	na
c. Connected explicitly to what you had learned in earlier professional learning community activities	1	2	3	4	5	na
d. Followed up with activities that built upon what you learned in earlier professional development activity	1	2	3	4	5	na
e. Designed to support state or district standards/curriculum frameworks	1	2	3	4	5	na
f. Designed to support state or district assessment	1	2	3	4	5	na

15. How were professional learning activities during the 2004/2005 academic year evaluated (if evaluated)? (Circle all that apply.)

Participants completed a survey	a
Participants were interviewed to provide feedback	b
The session was observed by an evaluator	c
My classroom was observed	d
Student outcomes in my classroom were evaluated	e
Some other form of evaluation took place (specify)	f
No discernible evaluation took place	g

16. To what extent do you feel that your knowledge and skills were enhanced in each of the following areas as a result of your participation in professional learning community activities during the 2004/2005 academic year? (Circle one response on each line.)

	Not at all				Great extent
a. Curriculum (e.g., units, texts, standards)	1	2	3	4	5
b. Instructional methods	1	2	3	4	5
c. Approaches to assessment	1	2	3	4	5
d. Use of technology in instruction (e.g., computers, graphing calculators)	1	2	3	4	5
e. Strategies for teaching diverse student populations (e.g., students with disabilities, from underrepresented populations, economically disadvantaged, range of abilities)	1	2	3	4	5
f. Deepening knowledge of subject area	1	2	3	4	5
g. Leadership development	1	2	3	4	5
h. Adapting teaching to meet state assessment requirements	1	2	3	4	5

i. Adapting teaching to meet state standards or curriculum framework requirements	1	2	3	4	5
j. Learning about state assessments in professional development	1	2	3	4	5
k. Learning about state standards or curriculum frameworks in professional development	1	2	3	4	5
l. Other: (please specify)	1	2	3	4	5

17. To what did you make each of the following changes in your teaching practices as a result of your participation in professional learning community activities during the 2004/2005 academic year (Circle one number for each line):

	No Change	Minor Change	Moderate Change	Significant Change
a. The subject area curriculum content	0	1	2	3
b. The cognitive challenge of subject area classroom activities	0	1	2	3
c. The instructional methods I employ	0	1	2	3
d. The types or mix of assessments I use to evaluate students	0	1	2	3
e. The ways I use technology in instruction (calculator or computer)	0	1	2	3
f. The approaches I take to student diversity	0	1	2	3

Appendix D: Teacher Interview Questions

Thank you for agreeing to take part in this interview. This interview is completely voluntary, and you are free to answer each question in whatever detail you feel is appropriate, to refuse to answer certain questions, or to end the interview at any time. As a reminder, all interview data will remain private, only being reviewed by me, and no interview data will be connected back to you in written or oral reports.

Experiences at previous school, focusing on instructional style and professional development

I want to begin by asking you to think back on the school at which you taught last year and the ways in which you would have characterized yourself as a teacher last year.

- How would you characterize your instructional style in the classroom in which you taught last year?
- How would you characterize your familiarity with your content area in the classroom in which you taught last year?
- Please describe the types of formal, school-sponsored professional development in which you participated last year?
- To what extent did you participate in professional learning community-type activities at your previous school?

Attributes of PLC activities, focusing on Garet's features

I would like to switch gears and ask you to reflect on the professional learning community activities in which you have participated this year.

- How would you describe the professional learning community activities in which you have participated this year, beginning by describing the specific activities in which you participated?
- Who typically participated in these PLC activities?
- In what ways did PLC activities either relate or not relate to developing your knowledge of your content area?
- In what ways did PLC activities involve active learning, such as observing other teachers and being observed, planning classroom implementation, reviewing student work, and presenting/leading/writing?
- In what ways did PLC activities either connect or not connect with issues outside of your classroom, including relating to your larger professional goals, aligning with state and district standards, or communicating with other teachers outside of your PLC group?
- Give three to five adjectives that would describe the professional learning community activities in which you have participated? (Explore each adjective in depth)
- From your perspective, what were the two or three most important aspects of PLC activities?
- What have been two or three ways in which PLC activities have been unsuccessful in meeting your needs as a professional?

Professional improvement this year, focusing on aspects of PLC activities that were successful

I would now like to ask you to reflect on the ways in which you have changed as a professional over the course of this year, and the extent to which you would attribute any changes to PLC activities.

- Thinking back on where you were as a teacher prior to coming to this school, in what ways do you think your familiarity with your content area has changed from June of last year to now?
- Thinking back on where you were as a teacher prior to coming to this school, in what ways do you think your instruction has changed from June of last year to now?
- To what extent would you attribute any of those changes to professional learning community activities? If there have been any changes attributable to professional learning community activities, what about those activities has promoted any changes?
- To what alternative factors, outside of PLC activities, would you attribute any changes in your content familiarity or instructional practices?
- If there are no changes attributable to professional learning community activities, why do you think professional learning community activities have not contributed to any changes?
- Thinking about your own personal development or improvement over the course of this year as compared to your development or improvement last year and in

prior years, in what ways is your development this year different from last year and prior years?

- In what ways is your development this year similar to last year or prior years?
- To what factors do you attribute differences or similarities in your development this year as compared to your development in previous years?

Professional improvement this year compared to last year, focusing on alternative explanations

For this final set of questions, I would like to ask you to reflect on the factors underlying any successes or failures in the PLC model at your school.

- To what extent would you attribute any successes or failures of PLC activities to the unique combination of personalities at your school? To what extent do you think that this same PLC model would have been successful with faculty members in your previous school?
- To what extent would you attribute any successes of PLC activities to the principal? To what extent do you think that this same PLC model would have been successful with the principal in your previous school?
- To what extent would you attribute any successes of PLC activities to the school schedule and structure common planning time? To what extent do you think that this same PLC model would have been successful with a different school schedule?

- Have you participated in professional learning community-type activities in prior schools? How did those activities compare to your school's PLC activities?