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IS WORKING TOGETHER WORTH IT?

EXAMINING THE RELATIONSHIP BETWEEN THE QUALITY OF TEACHER COLLABORATION, INSTRUCTION, AND STUDENT ACHIEVEMENT

A Dissertation Presented

by

MARK F. ZITO

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF EDUCATION

May 2011

Education

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By

MARK F. ZITO

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ABSTRACT

IS WORKING TOGETHER WORTH IT?

EXAMINING THE RELATIONSHIP BETWEEN THE QUALITY OF TEACHER COLLABORATION, INSTRUCTION, AND STUDENT ACHIEVEMENT

MAY 2011

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The purpose of this study was to examine the impact of a three-year Professional Learning Community (PLC) staff development initiative that took place in a suburban school district in Connecticut. An operational definition for PLCs was developed. This definition may prove beneficial for future research on PLCs. A comprehensive review of the current literature base was conducted, including the detailed examination of one earlier literature review (Vescio et al., 2008) and six empirical studies which examined the relationship between PLC-like initiatives and student performance. The present study builds upon the relevant literature base, specifically by attempting to determine the relationship between teacher collaboration and two dependent variables: changes in teachers' instructional practice and student achievement outcomes. In addition, the study considered the relationship between the support provided by administrators to PLCs and student achievement outcomes. Achievement outcomes were measured by performance on Connecticut's annual standardized assessments. Correlational and multiple regression analyses were conducted to examine the relationships between the variables. Survey data

were drawn from a sample of 325 teachers, while student achievement data were drawn from a sample of approximately 2,270 students.

A modest, statistically significant relationship was noted between administrative support for PLCs and student performance in both reading and writing. No statistically significant relationships were observed between collaboration and student achievement outcomes. A significant relationship was noted between collaboration and changes in instructional practice as measured by responses on the survey instrument. In addition, the interaction of teacher collaboration and administrative support served as a predictor for student performance in both reading and writing, suggesting that optimal learning occurs when teachers in PLCs collaborate at high levels while simultaneously receiving strong administrative support. The study concludes with a discussion of the implications of the findings for policy, professional practice, and future research on the topic of PLCs.

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CHAPTER 1

INTRODUCTION AND STATEMENT OF PROBLEM

Introduction

America's public schools are serving their students under increasing pressure to improve academic performance. The inexorable drive to reach continuously higher levels of student achievement was spurred by the No Child Left Behind (NCLB) legislation of 2002. The current economic recession has only exacerbated the stress on educators at all levels, as they are expected to push students' achievement scores higher than ever before (while also closing achievement gaps between different sub-groups of students), despite diminishing resources that have resulted in staffing cuts, larger class sizes, and fewer support services for many of the nation's students.

The increased emphasis on student achievement, as measured by large-scale, state-mandated summative assessments, has resulted in school leaders and education policymakers embracing the notion that teachers can no longer afford to work in isolation if they seek to improve the performance of their students. This trend is apparent in the current literature on professional development, where one can find an abundance of articles and books extolling the virtues of *teacher learning teams, collaborative learning teams, communities of continuous inquiry, professional learning communities,* and other configurations of collaborative work arrangements among teachers. In reality, educational researchers and advocates for educational reform have been writing about various forms of teacher collaboration as a means to improve educational outcomes since the early 1990's (Hord, 2004; Pounder, 1998). As Saunders, Goldenberg, and Gallimore (2009) indicated, there is "an intuitively appealing logic that underlies PLC [professional

learning communities] and learning team programs" (p. 1009). Yet, despite the significant body of literature regarding the importance of teacher collaboration in the effort to improve schools and the "intuitive logic" of such an approach, there is a dearth of empirical research that ties collaborative processes to improved teacher practice and improved student learning (Gallimore, Ermeling, Saunders, & Goldenberg, 2009; Goddard, Goddard, & Tschannen-Moran, 2007; InPraxis Group, Inc., 2006; Pounder, 1998; Saunders et al., 2009; Vescio, Ross, & Adams, 2008). The following quote from InPraxis Group, Inc. (2006) captures the current body of literature and contemporary wisdom regarding the value of teacher collaboration and PLC-like approaches:

> Although there is little empirical research that links collaborative processes directly with student learning and achievement, there is a relatively consistent recommendation emerging from the literature on professional development – those who share the same concerns and challenges will learn more effectively if they work together in a professional development experience and teacher quality can be positively affected. (p. 33)

The relative paucity of empirical research supporting the effectiveness of professional learning communities (PLCs) begs the following question: In schools that have implemented PLCs, to what extent have teacher practice and student achievement improved? This is the key question driving this study. Although a number of studies have documented evidence regarding the various benefits of PLCs, for example, enhanced teacher learning (Little, 2003; Grossman, Wineberg, & Woolworth, 2001), improved school culture (Supovitz, 2002), and changes in classroom practice (Brownell, Adams, Sindelar, Waldron, & Vanhover, 2006), the most valuable aspect of PLCs lies in their potential to impact student achievement in a positive manner. As Brownell et al. (2006) argued, "Ultimately, professional collaborative efforts are important only if they help teachers change in ways that promote student learning" (p. 184).

Purpose of the Study

The purpose of this study is to examine the impact of a three-year professional learning community (PLC) staff development initiative designed to influence teachers' classroom practice and student achievement outcomes in a suburban school district in Connecticut. The study is conceptually grounded in *social capital theory* (Leana & Pil, 2006; Nahapiet & Ghoshal, 1998) and the construct of *communities of practice* (Koliba & Gajda, 2009; Wenger & Snyder, 2000), both of which will be presented in Chapter 2. In short, social capital theory posits that the network of interpersonal relationships which exist within any organization is a valuable resource that has the potential to improve organizational performance (Nahapiet & Ghoshal, 1998). Social capital theory is essentially interrelated with research-based descriptions of communities of practice; these organization-based communities are also viewed as powerful units of analysis with the potential to improve overall organizational performance (Koliba & Gajda, 2009). This study will explore the relationship between the quality of collaboration within teacher-based teams and student achievement outcomes as measured by mandated, annual state assessments. In addition, the study will address the impact of administrative leadership on the success of PLCs by examining the relationship between teachers' perceptions of administrative support for discrete teacher teams (PLCs) and student achievement outcomes, again measured by mandated, annual state assessments. Finally, the study will explore the relationship between the quality of teacher collaboration and self-reported changes in instructional practice. To that end, the following research questions will be addressed:

- To what extent is there a relationship between the quality of teacher collaboration on discrete teacher teams (primary PLCs) and student achievement outcomes?

- To what extent is there a relationship between teachers' perceptions of administrative support for discrete teacher teams (primary PLCs) and student achievement outcomes?
- Do significant interaction effects between these two factors (quality of teacher collaboration and administrative support) exist?
- To what extent does the quality of teacher collaboration in PLCs influence changes in teachers' instructional practice?

The study employs quantitative analysis of archival survey data to address these research questions. It is my intention to contribute to the existing body of research on the relationship between PLCs and student achievement. In addition, it is important to explore the impact, if any, that the PLC initiative had on teachers' instructional practices in the district under consideration. As Brownell et al. (2006) noted, the true value of collaborative efforts lies in the potential to foster changes in instructional practice that improve student learning outcomes. Grounded in a conceptual framework which links social capital theory and the communities of practice construct, the research questions will test the following theoretical construct, or theory of action: If professional learning communities are properly designed and supported by administrators, and if teachers regularly engage in high-quality collaboration focused on analyzing student work, increasing content knowledge, and sharing effective instructional strategies, then teacher practice will improve, resulting in increased student learning. This theory of action finds a great deal of support in the existing literature (DuFour, DuFour, & Eaker, 2008; Hord, 2004; Little, 2003; Schmoker, 2004) and explicates the primary variables under examination in this research study.

CHAPTER 2

REVIEW OF THE LITERATURE

This review of the literature on professional learning communities will open with an overview of school reform efforts since the late 1950s in order to establish the rationale for the PLC approach for improving schools. In general terms, the multiple efforts at reform that have occurred over this roughly 50-year period have not succeeded with respect to making meaningful and lasting improvements as measured by student achievement outcomes. As will be demonstrated, large numbers of students still fail to graduate from the nation's high schools, a similarly large percentage of those students that do manage to graduate are ill prepared to succeed in college, and the nation's educational system continues to grapple with a large and persistent achievement gap between minority students and their White counterparts. The history of multiple and repeated failures to reform our schools calls for a new direction, and the PLC approach holds great promise for improving student learning outcomes due to (a) its ability to harness the power of collaborative problem solving among the professionals charged with ensuring that student learning occurs, and (b) the fact that the PLC approach is focused on improving what actually occurs in classrooms or the instructional core, that is, the interaction of teachers and students in the presence of subject-matter content (City, Elmore, Fiarman & Teitel, 2009).

Over 50 Years of School Reform

The Cold War Era and the Period of Radical School Reforms

Since the late 1950s, public education in the United States has been marked by numerous attempts at reform. Public concern regarding the perceived failure of our

nation's schools to produce citizens capable of competing against the citizens of foreign nations has frequently served as the catalyst for such reform efforts, beginning with the Soviet Union's successful launch of the *Sputnik* satellite in 1957. The *Sputnik* launch was a key event in the Cold War, and the propaganda effect of this wake-up call enabled politicians to brand our public schools as a scapegoat for America's secondary position in the space race; moreover, it resulted in the passage of the 1958 National Defense Education Act (NDEA), which provided federal funds that enabled school districts to increase the emphasis on mathematics, science, world languages, and other traditional liberal arts (DuFour & Eaker, 1998; Kaestle, 2007; Spring, 2005).

Following the *Sputnik* launch and the NDEA-driven emphasis on "the basics" (Spring, 2005, p. 2), the late 1960's and the early 1970's were characterized by what Ravitch (2010) described as "radical school reforms….a proliferation of experiments and movements in the nation's schools" (p. 23). Ravitch offered a number of examples, ranging from efforts to advance racial equality in the classroom and expand cultural diversity in the curriculum to plans to eliminate "burdensome requirements" (p. 23), such as graduation standards, tests, textbooks, grading, and college entrance examinations. Ravitch pointed to a *New York Times* headline story which appeared in 1975 indicating that the nation's Scholastic Aptitude Test (SAT) scores had declined steadily for over a decade. This headline triggered the formation of an SAT commission in 1977, which found that changes in schools' practices, including a reduction in the number of required academic courses, was at least partly responsible for the drop in scores. Ravitch posited that *A Nation at Risk* (Gardner et al., 1983) was a direct response to the "freewheeling

reforms of those years" (p. 23). The impact of *A Nation at Risk* and the flurry of major reform efforts that this highly publicized federal report generated will be addressed later.

The Effective Schools Movement

Another major reform initiative, which overlapped with the period of radical reforms described by Ravitch, was the Effective Schools Movement of the 1970s and 1980s. Some of the core principles of the Effective Schools Movement have persisted to this day and are linked to the PLC approach that constitutes the major focus of this paper. For example, the movement emphasized the importance of collaborative planning among staff members, called for the establishment and cultivation of collegial relationships, and recommended setting clear goals and high expectations for student learning (Purkey & Smith, 1983). The link between the Effective Schools Movement and the PLC approach will be explored in greater detail later.

While the Effective Schools Movement of the mid-1970s to early 1980s enjoyed great popularity in educational circles and spread rapidly to many large cities (Cuban, 1998), Purkey and Smith (1983) were critical of the majority of research used to support this movement. They found that such studies tended to focus on outliers; that they used small and narrow samples; that they failed to control for the effects of demographic factors such as social class; that they aggregated achievement data at the school-level, which tended to mask different effects for various subgroups; and that they used subjective criteria for determining school success. However, despite these significant shortcomings, Purkey and Smith argued that there was a "substantive case emerging from the literature" (p. 439), in support of the Effective Schools Movement. Along those lines, they posited the following:

> There is a good deal of common sense to the notion that a school is more likely to have relatively high reading or math scores if the staff agree to emphasize those subjects, are serious and purposeful about the task of teaching, expect students to learn, and create a safe and comfortable environment in which students accurately perceive the school's expectations for academic success and come to share them. (pp. 439-440)

Rossmiller and Holcomb (1983) argued that the Effective Schools Movement was a response to the findings of Coleman et al. (1966), who authored *Equality of Educational Opportunity*, a well-publicized report on the status of the nation's schools "which created the impression that schools make little, if any, difference in the learning of children and that the student's family, peers and the general social milieu exert much greater effect on learning than does the school" (p. 2). According to Rossmiller and Holcomb, the Effective Schools Movement "stems from the work of a number of researchers who were unwilling to accept the notion that schools make no difference" (p. 2). They described the movement as follows:

> The Effective Schools process envisions a learning community in which all relevant stakeholders – teachers, administrators, staff members, parents, community members, and students – are actively involved in creating a culture which strives for continuous improvement in all areas of the school community. The Effective Schools process has the following attributes:
> 1. It is a process that fosters systemic reform by helping schools and school districts establish and maintain a culture in which continuous improvement is the norm.
> 2. It adds knowledge drawn from organizational theory, organizational development, and the change process to the research base on school and teacher effectiveness.
> 3. It focuses on student outcomes with the expectation that all students can and will learn subject matter and master the skills and knowledge needed for success in life.
> 4. It is guided by a participatory management approach at the district, school, and classroom level that strives for continuous improvement so that problems are dealt with as they arise; change is viewed as a natural condition of life in schools. (p. 3)

Ryan (1993) agreed with Rossmiller and Holcomb (1983) that the Effective Schools Movement was a response to the Coleman report. According to Ryan, Effective Schools researchers used the school as the unit of analysis and used standardized test scores as the measure of effectiveness in order to demonstrate that higher performing schools shared certain key characteristics. Ryan argued that the movement had a relatively brief history and "it floundered when practitioners and others attempted to introduce desired practices into schools" (p. 79). Cuban (1998) presented a more positive review of the Effective Schools Movement than Ryan did, basing his evaluation on the notion that the specific criteria used to judge a reform have a significant impact on whether the reform is deemed a success or a failure. Cuban offered five standards used to determine the relative success of a reform. The first three standards are generally used by policymakers, the media, administrators, and researchers. These standards are (a) the effectiveness standard, based upon test scores or other numerical indicators; (b) the popularity standard, based upon public perception, media reports and opinion polls, etc.; and (c) the fidelity standard, i.e., the degree to which practitioners adhere to the blueprint offered by the reform's designers. The remaining two standards are used by practitioners. They are (d) the adaptability standard (the opposite of the fidelity standard), based upon the degree to which practitioners can modify the reform to fit their needs at the school level; and (e) the longevity or durability standard, based upon how long a given reform has endured. Judged by these sometimes conflicting standards, the Effective Schools Movement has been given a mixed-results review by Cuban. Assessed by the effectiveness (test scores) and fidelity standards, the movement failed. The Black-White achievement gap has persisted over time, and the Effective Schools Movement took a

variety of forms within schools and strayed away from a strict blueprint in many cases. With respect to the popularity standard, Cuban labeled the movement a success, largely because "Effective Schools ideology and essential features were drafted into a national crusade for excellence" (p. 469). The Effective Schools Movement also demonstrated a high degree of adaptability (which would deem it a failure on the fidelity standard) and significant longevity, as demonstrated by the fact that the many of its essential beliefs "continued to permeate reforms in the mid-to-late 1990's" (p. 470). According to Cuban, when the movement is assessed by these two practitioner-based standards, it should be deemed a success.

In summarizing the Effective Schools Movement, it appears that many of its central beliefs have persisted to the present day. As was noted earlier, some of the findings offered by Purkey and Smith (1983) can be viewed as a precursor to the PLC approach. Nearly three decades ago, these authors described a *school culture* approach for improving academic achievement that is "best characterized as one that promotes collaborative planning, collegial work, and a school atmosphere conducive to experimentation and evaluation" (p. 442). Moreover, they defined four characteristics of a productive school culture:

1. Collaborative planning and collegial relationships.
2. Sense of community.
3. Clear goals and high expectations commonly shared.
4. Order and discipline. (pp. 444-445)

Although the explicit references to the importance of collaboration and collegiality; community; and clear, commonly shared goals and expectations are related to the PLC approach, the Effective Schools Movement was not successful in improving student achievement over the long haul. As Cuban (1998) noted in his overall evaluation of the

movement, there was “no clear long-term trend of student improvement in academic performance” (p. 470). Part of this failure might be explained by the Effective Schools Movement’s reliance on “top-down decisions wedded to scientifically derived expertise” (Cuban, p. 461), as one of its core components. The tendency for reformers to rely on top-down mandates, and the inherent problems with this approach, will be examined later in greater detail. Although ultimately the Effective Schools Movement did not improve student achievement outcomes, its overall contributions should not be discounted or termed a complete failure: many of the movement’s most important concepts have persisted to this day and are alive and well as key elements of the PLC approach.

The Effective Schools Movement lasted into the early 1980’s – a period that was marked by the publication of *A Nation at Risk* in 1983. This momentous report on the status of American public schools had a significant impact on educational reform. In fact, some scholars (Hunt, 2008; McDermott, 2009) have argued that its impact has extended to the present day in the current iteration of standards-based reform under NCLB (2002). According to Hunt (2008), the report served as the catalyst for three distinct reform movements: the Excellence Movement, the Restructuring Movement, and the Standards Movement. DuFour and Eaker (1998) also identified the Excellence Movement and the Restructuring Movement, incorporating certain key elements of the Standards Movement into their description of the Restructuring Movement. Other authors (Spring, 2005; Tyack & Cuban, 1995) have identified the three major reform efforts outlined by Hunt; McDermott has written extensively about the Standards Movement. The following sections of this paper will examine these three separate reform movements in detail, beginning with the Excellence Movement.

The Excellence Movement

In the 1980s, Japan's rise as an economic superpower led to another crisis of confidence in the public schools as the United States' worldwide economic hegemony was challenged. In 1983, Gardner et al., who formed the National Commission on Excellence in Education, published *A Nation at Risk: The Imperative for Educational Reform,* a comprehensive report on the status of the U. S. education system. This report served as the hallmark battle cry of the era and sparked a cavalcade of school improvement initiatives that were collectively labeled the Excellence Movement (DuFour & Eaker, 1998). *A Nation at Risk* opened with the following ominous passage that forecast the downfall of the county unless extensive changes occurred in the education system:

> Our Nation is at risk. Our once unchallenged preeminence in commerce, industry, science, and technological innovation is being overtaken by competitors throughout the world. This report is concerned with one of the many causes and dimensions of the problem, but it is the one that undergirds American prosperity, security, and civility. We report to the American people that while we can take justifiable pride in what our schools and colleges have historically accomplished and contributed to the United States and the well-being of its people, the educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a Nation and as a people. What was unimaginable a generation ago has begun to occur – others are matching and surpassing our educational attainments. If an unfriendly foreign power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. (p. 5)

A Nation at Risk (1983) contained a series of recommendations which were grouped into five broad categories: Content; Standards and Expectations; Time; Teaching; and Leadership and Fiscal Support. The report suggested that America's relatively weak, low-skilled labor force imperiled our economic security, and it exhorted policymakers and educators to stem the "rising tide of mediocrity" (Gardner et al., 1983,

p. 5), by ensuring that students take more rigorous courses, that they work harder, that they get back to basics, and that they be prepared to compete against America's chief economic rivals – Japan, South Korea, and Germany (DuFour & Eaker, 1998; Spring, 2005; Tyack & Cuban, 1995; Wagner et al., 2006). Another recommendation included in *A Nation at Risk* – one which has had a lasting impact on public schooling in the United States – was the call for more state-mandated achievement testing at major transition points along the K-12 continuum. Specifically, the report recommended the following:

> Standardized tests of achievement (not to be confused with aptitude tests) should be administered at major transition points from one level of schooling to another and particularly from high school to college or work. The purposes of these tests would be to: (a) certify the student's credentials; (b) identify the need for remedial intervention; and (c) identify the opportunity for advanced or accelerated work. The tests should be administered as part of a nationwide (but not Federal) system of State and local standardized tests. This system should include diagnostic procedures that assist teachers and students to evaluate student progress. (p. 28)

Regarding the movement, Hunt (2008) attested the following:

> The intent of the excellence movement was to increase standards for students, as well as for classroom teachers, by tinkering with the conditions of teaching. This was the era of increased graduation requirements, longer school days or years, and enhanced teacher certification requirements…. In other words, the target was the education system in general, rather than what was happening inside individual classrooms. (pp. 581-582)

In addition, as DuFour and Eaker (1998) noted, while the Excellence Movement did indeed call for more intense efforts with respect to existing practices, it did not offer any new direction for reform and was ultimately labeled a failure by the U.S. Department of Education.

Restructuring and Standards—Concurrent Movements

As noted earlier, Hunt (2008) defined the Restructuring Movement and the Standards Movement as two separate waves of reform. While these two reform efforts

were different with respect to their strategies and areas of focus, they overlapped in terms of tracing the chronology of school reforms since the *Sputnik* era. In general terms, the Restructuring Movement called for reform at the level of the individual school through site-based management, while the Standards Movement cemented the importance of establishing core standards and national- and state-level goals for students (DuFour & Eaker, 1998; Hunt, 2008; Tyack & Cuban, 1995). In addition, Cuban (1998) tied the Standards Movement to the earlier Effective Schools Movement with the following argument:

> The linkage of the public schools to the economy in the early 1980's, in effect, nationalized the Effective Schools movement while dropping the brand name. Federal and state policymakers, believing in education as the engine for the economy and using the Effective Schools research, sought a broader and speedier impact on the nation's schools than the slower school-by-school approach. They called for national goals, curriculum, and tests. (p. 464)

In addition, both the Restructuring Movement and the Standards Movement were influenced heavily by political ideology and discussions among political elites which occurred at two national governors' summits on education. Those two summits are addressed in the next section.

National summits influence restructuring efforts and standards-based reform. In 1989, President George H.W. Bush convened a national governors' summit that resulted in the creation of *Goals 2000*, a series of six broad goals for educational outcomes in the United States (Cuban, 1998; DuFour & Eaker, 1998; Spring, 2005). *Goals 2000* was signed into law on March 31, 1994. Later, Congress would amend the original list to include two more goals. According to the North Central Regional Educational Laboratory (n.d.), *Goals 2000* was based on the underlying premise that students will achieve at higher levels when more is expected of them; hence, it

established a framework that allowed for (a) the identification of world-class academic standards, (b) the measurement of student progress, and (c) the provision of supports so that students may meet the standards. Moreover, it laid out the following eight goals (the original six plus the two additional ones), to be achieved by the year 2000:

1. All children in America will start school ready to learn.
2. The high school graduation rate will increase to at least 90%.
3. All students will leave grades 4, 8, and 12 having demonstrated competency over challenging subject matter including English, mathematics, science, foreign languages, civics and government, economics, the arts, history, and geography, and every school in America will ensure that all students learn to use their minds well, so they may be prepared for responsible citizenship, further learning, and productive employment in our nation's modern economy.
4. United States students will be first in the world in mathematics and science achievement.
5. Every adult American will be literate and will possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship.
6. Every school in the United States will be free of drugs, violence, and the unauthorized presence of firearms and alcohol and will offer a disciplined environment conducive to learning.
7. The nation's teaching force will have access to programs for the continued improvement of their professional skills and the opportunity to acquire the knowledge and skills needed to instruct and prepare all American students for the next century.
8. Every school will promote partnerships that will increase parental involvement and participation in promoting the social, emotional, and academic growth of children. (North Central Regional Educational Laboratory, n.d.)

In 1996, a second national education summit was convened at the International Business Machines (IBM) Conference Center in Palisades, New York. According to Spring (2005), the selection of this site reflected increasing levels of corporate interest and influence in public education. The conference was co-hosted by IBM chief executive Louis Gerstner and Governor Tommy Thompson of Wisconsin, the chair of the National Governors' Association (Spring, 2005, p. 11). Spring also noted that the 1996 summit emphasized the relationship between education policy and global economic growth.

DuFour and Eaker (1998) posited that 1996 summit marked the shift of control over the Standards Movement from the federal government to the states, in part due to increasing criticism that the federal government was attempting to take over the public schools and force a liberal agenda on students. Following this critical shift, the responsibility for creating national standards fell to curriculum experts and professional organizations (DuFour & Eaker, p. 6). Hence, both the 1989 and 1996 summits played key roles in placing the notion of *standards* for education at the forefront of reform efforts. However, as McDermott (2009) noted, the responsibility for standards and accountability policies currently rests at the state level.

A closer analysis of school reform efforts during this period reveals a bifurcated approach, with national goals and standards driving reform from the top while management of the learning process was shifted to the level of the individual school (DuFour & Eaker, 1998; Tyack & Cuban, 1995). As Tyack and Cuban observed, "At Charlottesville, Virginia, in 1989, President George Bush and the fifty governors – Democrats and Republicans alike – called for national standards and decentralized decision making" (p. 45). The description offered by Tyack and Cuban explains why the two-pronged approach has sometimes been divided into two separate movements (Standards and Restructuring) by authors such as Hunt (2008). The Standards Movement has persisted to this day in the form of the current NCLB (2002) legislation. However, the Restructuring Movement did not meet its goal of improving student outcomes, as site-based management focused on factors tangential to student learning (e.g., scheduling, parental involvement, school calendars, etc.) instead of targeting areas that would result in specific classroom-based improvements (DuFour & Eaker, 1998; Hunt, 2008).

The demise of the restructuring movement. According to DuFour and Eaker (1998), the Restructuring Movement initially generated high levels of optimism. Policymakers were confident that educators would embrace their newfound autonomy and work to find creative solutions for solving common problem of practice; in short, the theory underpinning site-based management suggested that schools would be more effective and students would learn at higher levels if control were ceded to those who worked directly with students. As Hunt (2008) noted, "this was the golden age of site-based management and the flattening of organizations….This effort to flatten organizations made intuitive sense when districts considered instituting site-based management" (p. 582). However, the Restructuring Movement, much like other reform efforts that had preceded it, failed to improve student learning outcomes as educators spent more time tinkering with structural issues such as scheduling or other non-academic areas such as student discipline, staff morale or school culture, and parental involvement (DuFour & Eaker, 1998).

The standards movement increases accountability for educators. As noted previously, Hunt (2008) described the Standards Movement, otherwise known as Standards-Based Reform (SBR), as another wave of reform which traced its roots to *A Nation at Risk* (1983). Regarding this movement, he made the following observation:

> It has shifted the public focus, sometimes with laser-like intensity, to the building level. It has redirected attention from the activities of teachers to the achievement of students. Rather than emphasizing the results of mandates such as course requirements and teacher certification standards, the movement has focused on how well individual students and groups of students are able to perform academically. (p. 583)

McDermott (2009) offered the following definition of SBR:

> The core idea of SBR is to replace the tangle of often-conflicting educational policies with a single idea: all students should master a common core of academic material, and if they do not, then the state should hold teachers, administrators, and sometimes students themselves accountable. Instead of regulating "inputs" such as class size, or time spent on certain subjects, the state should concentrate on setting standards and maintaining accountability through a system of rewards and punishments. (p. 92)

Bearing similarities to the description provided by McDermott, Jennings (1998) defined SBR as follows:

> It means that agreement will be achieved first on what students are to know and be able to do – the standards. Then the progress through school and graduation from high school will be determined according to the mastery of this content. Teachers will know ahead of time what they are to teach, and students will know what will be expected of them. (p. 6)

McDermott (2009) contended that SBR occurred in three waves. Moreover, each of these waves focused on the accountability of schools and school districts as measured by student test scores. The first wave appeared in the last quarter of the twentieth century when a number of state legislatures adopted minimum-competency testing programs, when some states threatened to enact harsh sanctions against school districts with poor test scores, and when ten states (six of them in the South) adopted *high stakes* graduation tests. The second wave began in 1986 when the National Governors' Association voiced its support for SBR, and the association's agenda placed a heavy emphasis on student performance as measured by test scores. The third wave started in 1994 with the reauthorization of the Elementary and Secondary Education Act which mandated that each state adopt some type of SBR in order to qualify for Title I federal funding. This third wave also served as the precursor for the passage in 2001 of NCLB, which required

each state to establish standards and administer tests based on those standards (McDermott, 2009, pp. 92-100).

Hunt (2008) described the present state of the Standards Movement, or SBR, as follows:

> In the current iteration of the standards movement, administrators at the building level are working with teachers and other staff members in their buildings to address the academic performance of individual students. They are collaborating to develop instructional strategies for use in their school improvement plans. One of the reasons we have NCLB with us today is that we paid too little attention to the various subgroups of students in the past. Historically, when administrators reviewed state assessments or nationally standardized assessment data, they were generally pleased if students were scoring at or above state or national averages, and they often dug no further. In many instances, the averages masked the comparatively poor performance of students in specific subgroups….The high-stakes nature of NCLB, however, has created many logistical and ethical dilemmas for school administrators….Some districts now "write off" those students they perceive as having little hope of making AYP [adequate yearly progress] and focus their efforts exclusively on the students with a real possibility of making AYP. (p. 584)

Hunt's description of the current era of standards-based reform raises two interesting points. First, Hunt noted that NCLB has forced educators to examine the performance of sub-groups, and that in some cases the performance of children in these sub-groups may have been masked by a tendency to focus on aggregate scores. Certainly, this is a positive outcome of NCLB. Hunt's second point may have been an unintended consequence of NCLB. He cautioned that as administrators become obsessed with reaching AYP targets, they risk ignoring children at the very bottom of the achievement ladder; for many allocating a share of limited resources in order to improve the achievement of these weaker students is perceived as wasting money on an investment that will yield little in return. Elmore (2005) identified another flaw in the current iteration of the Standards Movement, a flaw clearly created by the high-stakes accountability system of NCLB. In

framing this problem, Elmore used the term *reciprocity for accountability*. Elmore described the concept of reciprocity for accountability as follows: "For every increment of performance I require of you, I have a responsibility to provide you with the additional capacity to produce that performance" (p. 89). According to Elmore, the majority of state-level accountability systems do not address the notion of reciprocity; hence, they fail to meet the fundamental requirement of improving capacity in order to reach higher levels of student performance. Moreover, even in states that do offer some level of technical assistance to schools, the resources that are made available to schools cannot match the scope of the capacity problem. As Elmore posited,

> Lack of capacity is the Achilles' heel of accountability. Without substantial investment in capacity-building, all that performance-based accountability systems will demonstrate is that some schools are better prepared than others to respond to accountability and performance-based incentives, namely, the ones that had the highest capacity to begin with. (p. 118)

Hence, the major flaw of the current iteration of the Standards Movement under NCLB lies in the fact that while the bar has been set high, merely threatening to sanction schools without providing them with the capacity and resources that they need to improve will not result in higher levels of student achievement. Without appropriate resources and the capacity necessary for making substantial instructional improvements, the status quo, i.e., large numbers of failing students and an intransigent achievement gap (Elmore, 2005; Wagner et al., 2006), is likely to persist.

Summary of School Reform Efforts

The preceding sections of this paper provided an overview of attempts to reform the American system of public schools, beginning in the late 1950's. As Rossmiller and Holcomb (1983) attested:

> Despite the continuing press for reform, American schools have been remarkably resistant to systemic change. Although innovations appear and disappear with regularity, few persist long enough to have any lasting effect on the educational system. In truth, many of them are basically reincarnations of previous innovations dressed in new garb and given "new and improved" labels. (p. 1)

Three major reform efforts (Excellence, Restructuring, and Standards) were directed from the level of national policymakers: All three were initiated in response to public perceptions that the schools were failing. Even the Effective Schools Movement, which was based on school-level research and offered many promising ideas about how to improve educational outcomes, failed in its quest to improve student achievement. As Cuban (1998) noted, this failure may have been due to the movement's reliance on top-down mandates. The inherent flaw present in the hierarchical, top-down approach to school reform will be examined in greater detail later. As opposed to top-down mandates, many researchers and contemporary scholars (DuFour & Eaker, 1998; Elmore, 2005; Wagner et al., 2006) are now calling for a different approach to school reform. This approach relies on capturing the potential power of teacher collaboration and creating a laser-like focus on making substantive improvements to the instructional core, i.e., impacting positively what actually occurs inside classrooms on a daily basis. The next section of this paper describes why focusing on the instructional core is so critical.

The Importance of Focusing on the Instructional Core

A number of contemporary scholars (DuFour & Eaker, 1998; Elmore, 2005; Wagner et al., 2006) have posited that the most promising prescription for improving student performance is to focus on the instructional core. Elmore referred to the instructional core as the *technical core* of education which resides in individual

classrooms as opposed to the organizations that contain them, and he defined the core as follows:

> Detailed decisions about what should be taught at any given time, how it should be taught, what students should be expected to learn at any given time, how they should be grouped within classrooms for purposes of instruction, what they should be required to do to demonstrate their knowledge, and, perhaps most importantly, how their learning should be evaluated. (p. 46)

Moreover, City et al. (2009) identified the instructional core as the interactions between students and teachers "in the presence of content" (p. 38). They posited that the instructional core contains three leverage points: teachers' knowledge and skill, subject-matter content, and student engagement. City et al. provided a succinct description of their theory of school improvement with the following:

> There are only three ways to improve student learning at scale. The first is to increase the level of skill and knowledge that the teacher brings to the instructional process. The second is to increase the level and complexity of the content that students are asked to learn. And the third is to change the role of the student in the instructional process. That's it. If you are not doing one of these three things, you are not improving instruction and learning. Everything else is instrumental. That is, everything that's *not* in the instructional core can only affect student learning and performance by somehow influencing what goes on *inside* the core. (p. 24)

From this perspective, the demise of the Restructuring and Excellence Movements, much like many other reform efforts that failed to meet the demands of the public that schools demonstrate better results, can be linked directly to the failure of educators to focus on the core issues of teaching and student learning. DuFour and Eaker (1998) summarized the reason for the failure of the Restructuring Movement: "Unfortunately, restructuring seems to have left students virtually untouched by the reforms that swirl around, but not within, their classrooms" (p. 9). Cuban (1990), writing

about school reform two decades ago, made a similar observation regarding the repeated failure of such efforts:

> It should come as no surprise that many reforms seldom go beyond getting adopted as a policy. Most get implemented in word rather than deed, especially in classrooms. What often ends up in districts and schools are signs of reform in new rules, different tests, revised organizational charts, and new equipment. Seldom are the deepest structures of schooling that are embedded in the school's use of time and space, teaching practices, and classroom routines fundamentally altered even at those historical moments when reforms seek those alterations as the goal. (p. 9)

Similarly, Tyack and Cuban (1995) argued that the "grammar of schooling" (p. 85), characterized by large institutional bureaucracies and rigid, top-down hierarchical structures, has minimized the intended effects of most reforms because the instructional core is too far removed from the point of implementation. They posited that the institutional resiliency of schools and school systems has had a greater impact on attempts to implement reform policies than the policies themselves have had on educational practice. Writing about the grammar of schooling and the shielding effect that it has had on the failure of so many attempts at educational reform, Tyack and Cuban offered the following:

> To bring about improvement at the heart of education – classroom instruction, shaped by that grammar – has proven to be the most difficult kind of reform, and it will result in the future more from internal changes created by the knowledge and expertise of teachers than from the decisions of external policymakers. (pp. 134-135)

Tyack's reference to the knowledge and expertise of teachers as the vehicle that will drive meaningful improvements in schools is clearly linked to the notion of social capital (Nahapiet & Ghoshal, 1998), that will be reviewed when the conceptual framework for this study is presented later in the chapter. Furthermore, as Gajda and Koliba (2007) attested, "Contemporary school reform efforts call for a radical shift from the

predominant view of schools as bureaucratic and hierarchically ordered organizations to that of schools as communities of practice" (p. 28).

In summary, as a number of authors (Cuban, 1990; DuFour & Eaker, 1998; Elmore, 2005; Tyack & Cuban, 1995; Wagner et al., 2006) have contended, the failure of multiple reform efforts to improve student achievement can be attributed to the notion that such efforts have failed to access the collective knowledge and skills of teachers and they are typically focused on areas of the educational landscape which lie outside of the instructional core. Moreover, even when such reforms have attempted to address instructional issues, they have characteristically called for *more of the same* rather than asking educators to think about practicing *differently*. As Tyack and Cuban (1995) argued, the sheer size and rigidity of the stratified educational bureaucracy have often deflected attempts at school reform, preventing such attempts to improve schools from ever reaching the instructional core, or classroom level. When the core is not touched, the status quo persists, which necessarily means that the traditional and pervasive modes of interaction between teachers, students, and instructional content matter are not altered. Without changes at the heart of education, it is not surprising that the large-scale attempts at reform which have marked the last 50-or-so years have yielded little more than frustration and disappointment. In contrast to the failed reform efforts that preceded it, the PLC approach is uniquely situated to harness the power of the multiple teacher teams which exist in virtually every school by fostering focused and on-going professional collaboration in order to impact what occurs within the instructional core, that is, the improvement of teaching and learning. The next section of this paper will examine the PLC approach to school improvement.

PLCs as a Reform Initiative

The clarion call for school reform efforts aimed at the creation of professional learning communities continues to receive increasing support from a wide range of national organizations and contemporary scholars. This movement is based on the potential of high quality teacher collaboration to improve student learning outcomes. As Schmoker (2005) stated, "In both education and industry, there has been a prolonged, collective cry for such collaborative communities for more than a generation now. Such communities hold out immense, unprecedented hope for schools and the improvement of teaching" (p. 137-138). The NEA Foundation (2010), a nonprofit public charity operating under the auspices of the National Education Association (NEA), published a report that highlighted the importance of teacher collaboration as follows:

> As many commentators have noted, education is an isolating profession. Teachers tend to stay within their classrooms and seldom visit or work with other teachers in their buildings, much less in other schools. Principals seldom work with their peers to examine data or consider new approaches. Such isolation impedes learning. Collaboration helps educators examine their own practices and think about new ways of working. Teams can develop new techniques, try them out and look at the data. Individual teachers and principals do not have to reinvent the wheel on their own. (p. 9)

The National Board for Professional Teaching Standards (NBPTS) (n.d.) outlined five core propositions which serve as the foundation for the dispositions, knowledge, and competencies required to achieve national board certification. The fifth of these propositions addressed explicitly the importance of teachers participating in learning communities in order to improve student learning (NBPTS, n.d.). Likewise, the National Staff Development Council (NSDC) (n.d.) promulgated standards for staff development which called for professionals to organize into learning communities in order to improve the learning of all students. According to the NSDC, the most effective forms of staff

development involve teams which meet on a regular basis to learn together, plan jointly, and engage in collaborative problem solving (NSDC, n.d.). The Annenberg Institute for School Reform (AISR) (n.d.) advocated that professional learning communities can impact schools in four key areas: (a) fostering productive staff relationships; (b) encouraging professionals to engage in collective, consistent, and context-specific learning; (c) supporting teachers who work with the neediest students and thereby addressing inequities, both with respect to teaching and student learning opportunities; and (d) improving school culture, teacher practice, and student learning outcomes. Similarly, the National Association of Secondary School Principals (2004) published *Breaking Ranks II: Strategies for Leading High School Reform*, which urged educators to engage in meaningful change to improve student learning outcomes by recommending that schools promote collaborative teacher leadership and the development of professional learning communities. In summary, as Gajda and Koliba (2008) attested, "Consensus exists among school restructuring advocates that teacher collaboration is one of the most essential, if not the most important, requisite for substantial school improvement and critical student learning outcomes" (p. 134).

What is a Professional Learning Community?

As the term suggests, a *professional learning community*, within the context of a school, can be described as a team of *professionals* who focus on *learning* within an inclusive, supportive, and defined *community*. DuFour (2005) distinguished a critical characteristic of PLCs when he stated that the model is based upon the assumption that students *learn*, as opposed to being *taught*. Moreover, DuFour stressed that three key questions drive the work of PLCs:

1. What do we want each student to learn?
2. How will we know when each student has learned it?
3. How will we respond when a student experiences difficulty in learning? (pp. 32-33).

Fundamental to the PLC approach is the idea that each of the three questions posed by DuFour can best be addressed by teachers working together in a collaborative setting.

This section of the literature review provides an overview of the essential characteristics of professional learning communities from the perspective of four contemporary authorities. As one might anticipate, many of the themes overlap, most notably (a) the creation of a collaborative culture designed to examine common problems of professional practice and share strategies for improving teaching and learning, and (b) a commitment to developing a shared vision or set of values which define explicitly that the PLC is committed to ensuring high levels of student learning. In addition, DuFour et al. (2008) and InPraxis Group, Inc. (2006) addressed the notion of dissatisfaction with the status quo, i.e., existing levels of student achievement, while Hord (2004) and Newmann and Associates (1996) stressed the importance of deprivatizing or opening up practice to the point that teaching becomes public and colleagues become comfortable observing one another for the purpose of providing meaningful feedback.

DuFour, DuFour, and Eaker (2008) identified six core characteristics of PLCs:

- The development of a shared mission, a shared vision, shared values, and shared goals – all of which are focused on student learning. Moreover, educators must embrace high levels of learning for all students as both the reason that the organization exists and the fundamental responsibility of each professional who works within it.
- A collaborative culture with a focus on learning whereby collaborative teams work interdependently to achieve common goals linked to the purpose of learning for all and for which members are held mutually accountable.
- Collective inquiry into best practice and current reality which help educators to develop shared knowledge which, in turn, allows them to make more informed decisions and increase the chances that they will arrive at consensus.

- An action-orientation approach centered on the notion of "learning by doing" whereby educators understand that the most powerful learning always occurs in the context of taking action.
- A commitment to continuous improvement characterized by a persistent disquiet with the status quo and a constant search for a better way to achieve goals and accomplish the purpose of the organization.
- A results orientation where the members of the PLC understand that the assessment of their efforts must be based on results as opposed to intentions. (pp. 15-17)

Hord (2004) identified the following five themes characteristic of PLCs:

- *Supportive and shared leadership* requires collegial and facilitative participation of the principal who shares leadership – and thus, power and authority – by inviting staff input and action in decision-making.
- *Shared values and vision* include an unwavering commitment to student learning that is consistently articulated and referenced in the staff's work.
- *Collective learning and application of learning* requires [*sic*] that school staff at all levels are engaged in processes that collectively seek knowledge among staff and application of the learning to solutions that address students' needs.
- *Supportive conditions* include physical conditions and human capacities that encourage and sustain a collegial atmosphere and collective learning.
- *Shared practice* involves a review of a teacher's behavior by colleagues and includes feedback and assistance activity to support individual and community improvement. (p. 7)

InPraxis Group, Inc. (2006) identified four key understandings regarding PLCs

that have emerged from the literature since 1996:

- PLCs are based on a stance toward learning that emphasizes inquiry and reflection. They function through a continuous engagement with the learning processes in the school that involves challenging the status quo – the teaching and learning, relationships, structures, functions and assumptions that are part of the organizational climate.
- PLCs are successful because they build capacity for leadership, learning, and growth. They both need and provide support within the physical and human environments of the learning organization.
- PLCs emphasize the learning process of teaching and recognize and respect the professional knowledge embedded in their practice. They respect the principles of adult learning and provide relevant and meaningful professional development activities.
- PLCs are themselves an impetus for change that is focused on the improvement of teacher quality and student learning, growth and achievement. (pp. 7-8)

Newmann and Associates (1996) identified five essential characteristics of PLCs:

- Shared values and norms regarding issues such as beliefs about children and their ability to learn; the appropriate roles for parents, teachers, and administrators; and use of time and space.
- A clear and consistent focus on student learning. Professional conversations and actions center on ensuring that students have improved opportunities to learn and that student achievement is continuously enhanced.
- Reflective dialogue that encourages extensive and ongoing conversations among teachers regarding curriculum, instruction, and student development. In strong professional communities, reflective dialogue enables practitioners to engage in self-evaluation and assess the effectiveness of the school as a whole.
- Deprivatizing teacher practice and making it public so that peers become an important source of insight and feedback.
- Engaging in collaboration as a natural extension of deprivatizing practice. When teachers collaborate, they can increase their technical competence by sharing expertise with one another, and they are able to develop materials and activities for improving curriculum and instruction. (pp. 181-183)

The Critical Element of Teacher Collaboration

Teacher collaboration serves as a core characteristic of PLCs; moreover, the importance of teacher collaboration has been emphasized by a number of scholars (DuFour et al., 2008; Gajda & Koliba, 2008; Hord, 2004; InPraxis, 2006; Morrissey, 2000; Newmann & Associates, 1996; Schmoker, 2004). Additionally, Pounder (1998) posited that the most critical reform effort in public education involved restructuring schools in order to promote teacher collaboration and that "increased collaboration among teachers and professional educators can tighten the connection between educators' work and student outcomes, especially increasing educators' comprehensive knowledge and responsibility for students' learning and school experiences" (p. 174). DuFour et al. (2008) offered the following insight regarding the importance of collaboration within the framework of professional learning communities:

> If shared purpose, vision, collective commitments, and goals constitute the foundation of a PLC, then the collaborative team is the fundamental building block of the organization. A PLC is composed of collaborative teams whose members work *interdependently* to achieve *common goals* – goals linked to the purpose of learning for all – for which members are held *mutually accountable*. It

> is difficult to overstate the importance of collaborative teams in the PLC process. It is equally important, however, to emphasize that collaboration does not lead to improved results unless people are focused on the right issues. Collaboration is a means to an end, not the end itself….In a PLC, *collaboration* is a systemic process in which teachers work together, interdependently, to analyze and *impact* professional practice in order to improve results for their students, their team, and their school. (pp. 15-16)

As was touched upon previously, Hord (2004) identified five themes or dimensions which are characteristic of PLCs, noting that all five dimensions are intertwined. Moreover, two of the themes, *collective learning and application of learning* and *shared practice,* are directly tied to collaborative processes within the framework of the professional learning community. As Hord indicated regarding collective learning and application of learning, "collaborative work is grounded in *reflective dialogue* or *inquiry*, where staff conduct conversations about students and teaching and learning, identifying related issues and problems" (p. 9). Furthermore, in addressing shared practice, Hord argued the following:

> In PLCs, review of a teacher's practice and behavior by colleagues should be the norm. The practice is not an evaluative process, but part of the "peers helping peers" process that includes teachers visiting each other's classrooms on a regular basis to observe, take notes, and discuss their observations with the teacher they have visited. In the process, teachers act as change facilitators for each other, supporting the adoption of new practices through peer coaching and feedback. (p. 11)

Likewise, Newmann and Associates (1996) posited that reflective dialogue was a critical element of PLCs, and that collaboration enables teachers to share their expertise, thereby improving the overall level of collective technical competence. Gajda and Koliba (2007) suggested that in order "to reach essential prekindergarten through Grade 12 outcomes, such as a healthy school climate and increased student performance, educators are being

challenged to capitalize on the power of interpersonal collaboration" (p. 28). Similarly, Morrissey (2000) posited the following:

> In professional learning communities, a spirit of professional respect and trust motivates teachers to work together on school improvement initiatives. Teachers view themselves and their colleagues as members of a team of professionals who can, by working in concert and in support of one another, address the challenges that face the school. Teachers collaborate on issues directly related to student learning. (p. 38)

Clearly, many scholars who have studied the PLC approach to school improvement recognize that collaboration is an essential – if not *the most* essential – element of PLCs. As DuFour et al. (2008) argued, within a professional learning community, "the collaborative team is the fundamental building block of the organization" (p. 15).

After reviewing the general descriptions of PLCs (DuFour, 2005; DuFour et al., 2008; Hord, 2004; InPraxis Group, Inc., 2006; Newmann & Associates, 1996) and the more specific descriptions of PLC-based *collaboration* presented in the preceding paragraph, certain key phrases were identified. These phrases appear to be essential in terms of operationalizing, or framing, the critical construct of collaboration and are listed below:

- *Teachers working together* (DuFour et al., 2008; Morrissey, 2000).
- *Reflective dialogue that improves practice* (Hord, 2004; Newmann & Associates, 1996).
- *Common goals* or *shared vision* (DuFour et al., 2008; Hord, 2004; Newmann & Associates, 1996).
- A focus on *student learning* or *increased student performance* (DuFour et al., 2008; Gajda & Koliba, 2007; Hord, 2004; Morrissey, 2000; Pounder, 1998).

In consideration of the work of the various scholars noted above, collaboration can be understood as *teachers working together, and engaging in reflective dialogue, with the common goal of improving practice and increasing student learning*. Developing

an understanding of what collaboration *actually means* is an important prerequisite for conducting research on PLCs. As Woodland and Hutton (2011) noted,

> Although collaboration has the capacity to leverage fragmented systems and produce increased organizational efficiency and effectiveness, its definition is elusive, inconsistent, and often theoretical. The term "collaboration" has come to signify just about any type of relationship between organizations and people. Relatively few can say with certainty what collaboration looks and feels like, if their collective actions constitute true collaboration, how to determine if the structural, procedural, and inter-professional relationships among partners are healthy, or how to make them better. Researchers are confronted with the same uncertainties, often unsure how to systematically examine such an under-empiricized construct. Therefore, one of the most important actions that researchers of organizational collaboration must take is to operationalize the construct of collaboration. Operationalization, whereby we descend the "ladder of abstraction" by describing reality through theory, is a central component of all empirical evaluation research. (p. 2)

Hence, in accordance with Woodland and Hutton's concept that developing a true grasp of collaboration is an essential action prior to conducting research in the area of PLCs; a viable definition for the construct has been offered. This definition, derived from the literature, helps reform-minded administrators and teachers acquire a better understanding of collaboration within the framework of PLCs. Collaboration will be addressed again in Chapter 3, where an operational definition for primary PLCs is presented. Moreover, the current study, grounded in the social capital/community of practice conceptual framework, is based upon a theory of action which asserts that if teachers engage in high quality collaboration on leverage points such as analyzing student work, increasing content knowledge, and sharing effective instructional strategies, then teacher practice will improve, resulting in increased student learning. As DuFour et al. (2008) asserted:

> Schools cannot achieve the fundamental purpose of learning for all if educators work in isolation. Therefore, school administrators and teachers must build a

> collaborative culture in which they work together interdependently and assume collective responsibility for the learning of all students. (p. 18)

The preceding sections of this paper provided an overview of the current push to implement PLCs as a viable approach to school reform; reviewed the essential characteristics or dimensions of PLCs; and addressed the critical importance of teacher collaboration. Teacher collaboration, as an empirical construct, was examined in great detail, and four essential phrases were extracted from the literature. These essential phrases help to establish a common frame of reference for understanding collaboration as it pertains to the core work of professional learning communities. By understanding the true nature of collaboration and its core elements, researchers and practitioners alike are in a better position to assess the effectiveness of PLC initiatives once they have been implemented.

The next section of this paper presents a conceptual framework that will be used to guide this research study. As was noted in Chapter 1, this framework links social capital theory with the communities of practice construct. The conceptual framework helps to situate two interrelated elements that are critical to the success of PLCs:

1. The PLC approach is premised on the potential power of teacher collaboration, accessed through individual communities of practice as the unit of analysis, to solve problems of practice that occur within the instructional core.
2. As opposed to many of the failed reform movements addressed previously, the PLC approach is not a top-down reform effort. Instead, properly functioning PLCs rely on regular and on-going collaboration between and among school-based professionals to impact what is happening at the level of the individual school and within individual classrooms.

Conceptual Framework

Social Capital Theory

Social capital has been generally understood as the actual and potential resources existing in the personal relationships and linkages among members of a group or organization (Bourdieu, 1986; Leana & Pil, 2006; Nahapiet & Ghoshal, 1998). Nahapiet and Ghoshal, drawing upon the work of Jacobs (1965), indicated that the term first appeared in community studies, where it was used to describe networks of strong, overlapping personal relationships that developed over time within city neighborhoods. These relationships formed the basis for cooperation, trust, and collective action, serving a critical role in ensuring the survival and proper functioning of such neighborhoods. In addition, Nahapiet and Ghoshal suggested that the construct of social capital has received increasing attention from researchers in a number of fields due to its potential to influence organizational performance. According to Nahapiet and Ghoshal, the "central proposition of social capital theory is that networks of relationships constitute a valuable resource for the conduct of social affairs" (p. 243).

Leana and Pil (2006) posited that social capital can enhance organizational performance; moreover, they described two distinct aspects of social capital: internal and external. Internal social capital was described as the existing linkages among members within an organization, while external social capital referred to ties between the members of the organization and external stakeholders. Nahapiet and Ghoshal (1998) provided descriptions for three separate dimensions of internal social capital: structural, relational, and cognitive. The structural dimension describes the properties of the organization and the overall network of existing relationships, the relational dimension describes the

particular personal relationships in which individuals are engaged and the manner in which these relationships influence their behaviors, and the cognitive dimension describes shared representations and systems of meaning among individuals in the organization. Leana and Pil (2006) examined these three distinct dimensions and provided additional information that is particularly relevant when one considers the application of social capital theory to an examination of the impact of professional learning communities on teacher practice and student achievement. Leana and Pil indicated that the structural dimension, or the overall network of relationships, is able to facilitate information sharing and the exchange of knowledge among individuals; that the relational dimension is able to foster enhanced levels of trust among individuals, which in turn encourages an environment of collaboration; and that the cognitive dimension, which develops over time as individuals interact with one another as part of the group, enables the group to develop a shared vision and common goals.

For the purposes of this study, internal social capital carries more relevance than external social capital, particularly when one considers the potential of schools to create and support internal networks that engage in information sharing, that collaborate on shared problems of practice, and that develop a shared vision and common goals – all with an eye toward improving student learning. However, the importance of external social capital should not be disregarded completely, for both administrators and teachers have the ability to form linkages with outside agents (e.g., educators in other school districts, university professors, state agencies, business organizations, parents and other community members, etc.), and these outside agents have the potential to share useful knowledge and information or bring resources into the school setting.

In summary, *social capital* informs the theory of action that was developed for the present study. The theory of action calls for administrators to design and support PLCs with the intent of fostering *high-quality collaboration* among teachers. It is through these interpersonal interactions that the social capital of the teacher teams is accessed in order to improve both teaching practice and student learning. Moreover, social capital theory (Leana & Pil, 2006; Nahapiet & Ghoshal, 1998) bears striking similarities to the communities of practice construct (Koliba & Gajda, 2009; Wenger & Snyder, 2000) which will be presented next and serves as the second element in the conceptual framework which guides this study.

Communities of Practice

Wenger and Snyder (2000) described a *community of practice* as composed of groups of individuals "informally bound together by shared expertise and passion for a joint enterprise – engineers engaged in deep water drilling, for example, consultants who specialize in strategic marketing, or frontline managers in charge of check processing at a large commercial bank" (p. 139). The authors argued that communities of practice served to improve organizational performance in a diverse array of companies, e.g., an international bank, an automobile maker, and an American government agency; however, such communities lacked prevalence due to the following three factors:

1. The term recently entered the business vernacular.
2. By the year 2000, only a small number of "forward thinking" firms had taken the steps necessary to implement them.
3. It is not easy to develop and sustain communities of practice or to integrate such communities into the existing infrastructure of an organization. (p. 140)

In their description of communities of practice, Wenger and Snyder (2000) identified six ways in which they add value to an organization:

1. They help drive strategy because they generate knowledge and “know-how.”
2. They start new lines of business – acting like “petri dishes” for entrepreneurial insights that generate more clients, mold the company’s strategy, and enhance the company’s reputation.
3. They solve problems quickly because members know whom to approach for help when an obstacle is encountered.
4. They serve as an “ideal forum” for sharing and spreading “best practices” across a firm.
5. They develop the professional skills of their members because they create an environment in which “peer coaching” and “mentoring” occur.
6. They help companies recruit and retain talent – allowing firms to win “the war for talent.” Professionals are attracted to firms when they have an opportunity to collaborate within such communities and develop new skills and find new clients. (pp. 140-141)

Wenger and Snyder (2000) cited two examples of successful communities of practice within the business world. The first example they provided was work which occurred at the Hill’s Pet Nutrition facility in Richmond, Indiana. Technicians on the pet food assembly line successfully implemented a pneumatic tube system that replaced the conveyer belt system. The line technicians were able to convince upper management that the new system would work more effectively, citing evidence from colleagues working in similar plants. The net result of this community’s innovative approach was that the factory significantly reduced downtime and the amount of wasted pet food.

As a second example, the authors presented Hewlett-Packard (HP). In this company, product-delivery consultants from throughout North America formed a community of practice that engaged in monthly teleconferencing. A key finding was that members of the community came to the realization that they shared many common problems and that they could learn from one another. The HP community of practice was successful in standardizing the sales and installation processes for software and in developing a uniform pricing menu for HP sales associates. In their discussion of both examples, Wenger and Snyder stated the following:

> The participants in these communities of practice were learning together by focusing on problems that were directly related to their work. In the short term, this made their work easier or more effective; in the long term, it helped to build both their communities and their shared practices – thus developing capabilities critical to the continuing success of the organizations. (p. 143)

The lessons learned in the business world, as evidenced by both the Hill's and Hewlett-Packard examples, are relevant when one considers the potential of communities of practice to impact teachers' instructional approaches and student achievement outcomes within the field of education. Teachers working in communities of practice benefit both in terms of short-term problem solving (e.g., refining daily instructional strategies to target students' highly specific learning deficits) and with respect to long-term capacity building (e.g., becoming more effective at analyzing formative and summative assessment data, developing stronger content knowledge, becoming better at differentiating instructional approaches in order to meet the unique needs of each student).

Wenger and Snyder (2000) developed a "snapshot comparison" (p. 142), to summarize the various characteristics of communities of practice, formal work groups, project teams, and informal networks. This information is presented in Table 2.1.

Table 2-1: Wenger and Snyder (2000)—A snapshot comparison.

Group Type	What's the purpose?	Who belongs?	What holds it together?	How long does it last?
Community of Practice	To develop members' capabilities; to build and exchange knowledge	Members who select themselves	Passion, commitment, and identification with the group's expertise	As long is there is interest in maintaining the group
Formal work group	To deliver a product or service	Everyone who reports to the group's manager	Job requirements and common goals	Until the next reorganization
Project team	To accomplish a specified task	Employees assigned by senior management	Mutual needs	As long as people have a reason to connect
Informal network	To collect and pass on business information	Friends and business acquaintances	Mutual needs	As long as people have a reason to connect

(Wenger & Snyder, 2000)

Koliba and Gajda (2009), drawing upon the work of Wenger (1998), presented communities of practice as an analytical construct and stated that such communities exist when the following three criteria have been satisfied:

1. A group has formed that can be said to be comprised of members. These members share a common set of characteristics that may be compromised [*sic*] of similar interests, expertise, roles, goals, etc.;
2. A physical or virtual space exists for these members to interact directly with one another. Spaces can be created through the formal or informal designation of physical meeting times and places or virtually, as space for ongoing dialogue. This space affords opportunities to dialogue with one another and that this dialogue is not mediated by a third party. This space forms the basis through which a "shared repertoire" for the group can emerge;
3. The group can be said to possess a common domain, practice or set of practices. (p. 102)

Koliba and Gajda indicated that the term communities of practice (CoP) "has been applied extensively across multiple social science disciplines and professional fields and has become a widely used theoretical construct since it was first introduced by Jean Lave and Etienne Wenger in 1991" (p. 97). They asserted that CoP theory is currently being used in a wide range of disciplines, including such fields as education, business management, healthcare, and public administration and that "CoP theory is used to articulate workplace learning when professionals' learning and reflection are considered within the context of group dynamics" (p. 104).

Over a decade ago, as they summarized their article on communities of practice, Wenger and Snyder (2000) posited the following:

> Communities of practice are emerging in companies that thrive on knowledge….Communities of practice are the new frontier. They may seem unfamiliar now, but in five to ten years they may be as common to discussions about organization as business units and teams today – if managers learn how to make them a central part of their companies' success (p. 145).

In hindsight, these words were prescient when one considers the proliferation of such communities within the worlds of both business and education. More recently, Koliba and Gajda (2009) suggested that a community of practice is "a potentially powerful unit of analysis in part because it situates the role of organizational learning, knowledge transfer, and participation among people as the central enterprise of collective action" (p. 118). The notion that communities of practice have the potential to improve organizational performance is nearly identical to the central proposition of social capital theory as presented by Nahapiet and Ghoshal (1998), that is, such communities or networks "constitute a valuable resource for the conduct of social affairs" (p. 243).

In summary, the integration of social capital theory with the communities of practice construct provides a useful framework for the examination of professional learning communities on teacher practice and student achievement. Seen through this theoretical lens, the *network of relationships* inherent within every school – and the ability to harness the power of its structural, relational, and cognitive dimensions – is a valuable resource that has the potential to influence changes in teacher behavior that should result in higher levels of student achievement. Ultimately, in terms of framing this research study, both social capital theory and the communities of practice construct can be linked to contribute an important premise: When groups within organizations collaborate on shared problems of practice, they have the potential to significantly and positively impact organizational performance. This premise is closely linked to the theory of action for the present study (i.e., PLCs, if properly designed and supported, will improve teaching practice, resulting in increased student learning).

The next section of this paper will examine several reasons why our educational system is in need of reform. In short, disheartening inequities between various sub-groups of students have persisted to the present day: Large numbers of students fail to graduate from high school, many students that do manage to graduate from high school are ill equipped to succeed in college, and a significant achievement gap exists between most racial minority groups and their White counterparts.

Why We Need Meaningful Reform in Our K-12 System

In order to demonstrate that the nation's public schools are losing many students prior to graduation and that the schools are not serving all groups of students in an equitable manner, it is important to consider a number of outcome measures. In terms of educational outcomes, data related to graduation rates, college-readiness rates, and the persistent Black-White achievement gap as measured by performance on standardized assessments have been provided.

High School Graduation Rates

Greene and Forster (2003) examined high school graduation rates and college-readiness rates in the United States. They reported results for the nation as a whole, for four regions (Northeast, Midwest, South, and West) and for all 50 states and the District of Columbia. Using enrollment data and diploma counts obtained from the U.S. Department of Education's Common Core of Data (CCD), Greene and Forster estimated the graduation rate for the class of 2001. The cohort under examination entered high school in 1997-98. The researchers employed statistical *smoothing* by averaging three numbers (the total 8th-grade enrollment in 1996-97; the total 9th-grade enrollment in 1997-98; and the total 10th-grade enrollment in 1998-99) to estimate the size of the 9th-

grade cohort in 1997-98. This procedure enabled Greene and Forster to adjust for the number of students who are typically held back in ninth grade each year, that is, without the smoothing technique they would have overestimated the ninth-grade cohort for 1997-98. After establishing the estimated ninth-grade cohort size for 1997-98, Greene and Forster examined the total high school enrollment for 1997-98 (the year the cohort entered) and the total high school enrollment for 2000-01 (the year the cohort graduated from high school). They used this information to measure the overall change in the high school population during the four-year period under consideration. After calculating the percentage change in the overall high school population during this four-year period, Greene and Forster multiplied the percentage change by the smoothed estimate of the 1997-98 9th-grade cohort in order to estimate the change in the cohort population and establish the 12th-grade cohort estimate for 2000-01. Examining the overall change in the high school population during this four-year period was important: it enabled the researchers to account for students who had moved out of the country, or a given region or state, and to lower the estimated cohort size to avoid classifying students who had moved as dropouts. Likewise, the technique enabled Greene and Forster to account for students who had moved into the country, or a given region or state, and increase the estimated cohort size. In addition to monitoring the overall change in the cohort size, the researchers were also able to make adjustments for the estimated cohort size in each of the four regions, as well as each of the 50 states and the District of Columbia. After establishing the estimated cohort size for 2000-01, Greene and Forster determined the graduation rate by dividing the number of diplomas awarded in the spring of 2001 by the

estimated cohort size. Table 2-2 displays Greene and Forster's data on graduation rates, disaggregated by racial category:

Table 2-2: Estimated graduation rates for different racial categories.

Racial Category	Estimated U.S. Percentage of Entering Ninth-Graders in 1997-98 who were awarded diplomas in the spring of 2001
American Indian	54%
Asian	79%
Black	51%
Hispanic	52%
White	72%
Overall Total – All Students/All Races	70%

(Greene & Forster, 2003)

An examination of the data in Table 2-2 indicates that barely one-half of all American Indian, Black, and Hispanic students who had entered high school in the fall of 1997 graduated four years later. Certainly, these data are troubling, for they suggest that these groups are being poorly served by the nation's education system. Overall, nearly one-third of all students who had entered high school in the fall of 1997 did not graduate four years later.

College Readiness

In addition to studying graduation rates, Greene and Forster (2003) determined college-readiness rates. These data are troubling as well, for they suggest that a significant number of high school graduates complete their K-12 educational experiences lacking the basic skills which would allow them to succeed in college. As Greene and Forster indicated,

> There is a gap between what high schools require for graduation and what four-year colleges require before they can consider students' applications, causing many students to graduate from high school unable to apply to college. Since

> college is a key to greater opportunity throughout the rest of a student's life, this gap in the educational pipeline has serious consequences for those students whose high schools fail to prepare them, as well as for equality of opportunity among students of different races. (p. 3)

In order to establish the college-readiness rate, Greene and Forster applied three *screens* to determine the percentage of entering ninth-graders in 1997-98 who left high school in the spring of 2001 deemed college-ready. It is important to note that, while conducting their research on college readiness, Greene and Forster used data gathered from a large national study called the National Assessment of Education Progress (NAEP) High School Transcript Study. As Greene and Forster pointed out, although the data compiled in the NAEP study were from 1998, they used those data in determining the 2001 college-readiness rate because they did not feel that "levels of college readiness had changed dramatically by 2001" (p. 7). The first of Greene and Forster's three screens was simply high school graduation, i.e., students who failed to finish high school were automatically classified as not college-ready. Moreover, Greene and Forster's screens were designed to assess the performance of the public schools in terms of preparing students for college during the normal continuum of the K-12 experience, that is, what they referred to as the "public school pipeline" (p. 7). As they pointed out, "our screens do not look for students who have 'leaked' out of the public school pipeline but have subsequently made themselves college-ready" (p. 7). The second screen examined student transcripts and considered the minimal level of coursework required for admission to a four-year college or university of "the lowest level of prestige and selectivity" (p. 7). This screen required students to have taken the following courses in high school: English – four years; mathematics – three years; natural science, social science, and world languages – two years each. The third and final screen was based

upon reading skills as determined by a cutoff score of 265 on the NAEP reading test, which represented a *basic* level of reading ability. After applying their three screens to the cohort which entered high school in 1997-98, Greene and Forster reported data regarding college-readiness rates as shown in Table 2-3.

Table 2-3: Estimated college-readiness rates for students entering grade 9 in 1997-98.

Racial Category	Estimated Percentage of All Students who entered ninth grade in 1997-98 and graduated with a college-ready transcript	Estimated Percentage of All Students who entered ninth grade in 1997-98 and graduated with a college-ready transcript and made the NAEP cutoff score of 265 in reading
American Indian	21%	14%
Asian	46%	38%
Hispanic	22%	16%
Black	25%	20%
White	39%	37%
Overall Total/All Races	36%	32%

(Greene & Forster, 2003)

The data presented in the middle column of Table 2-3 suggest that slightly over one-third (36%) of the nation's high school students who entered ninth-grade in 1997-98 completed their high school experiences as *graduates* with a *college-ready transcript*. In other words, while 70% (see Table 2-2) of the cohort who entered high school in 1997-98 did manage to graduate, approximately one-half of these students did not take the minimum number of courses required for admission to a four-year college. Moreover, an even lower percentage of students (32%) passed all three screens (see the far right column of Table 2-3), which suggests that some of the high school graduates who did pass the transcript screen still failed to demonstrate basic reading skills. Finally, and perhaps most troubling of all, is the fact that minority students, with the notable exception of Asians, fared far worse than White students. The data suggest that only one in five

Black students who entered high school in 1997-98 graduated college-ready, and the percentages were even lower for American Indian and Hispanic students. Wagner et al. (2006), the authors of *Change Leadership, A Practical Guide to Reforming Our Schools,* reviewed the data presented by Greene and Forster and made the following argument:

> In the 1970's, our graduation and college-readiness rates were even lower than they are today, but this was not considered a "crisis." It has become a crisis because of the nature of the skills needed in today's knowledge economy. Our economy has transitioned from one in which most people earned their living with skilled hands to one in which all employees need to be intellectually skilled if they hope to make more than minimum wage. In nearly every industry today, companies are hiring the most highly educated people that they can find or afford. (p. 3)

If today's global economy is indeed becoming one that is increasingly knowledge-based, then the data presented by Greene and Forster (2003) suggest that our nation's schools must do a better job of preparing our students. Furthermore, the data indicate that the public schools are doing a woeful job of educating minority students, too many of whom, lacking the skills to compete in today's economy, will be relegated to a life of marginal employment.

The Democratic Ideal: Another Reason for Improving Education

Outside of the parameters of the economic argument advanced by Green and Forster (2003), there exists another line of thinking which underscores the importance of improving educational outcomes for all students. This argument was proffered by John Dewey (Morris & Shapiro, 1993, pp. 110-120), and it essentially advances the notion that improving education for its own sake is a worthwhile pursuit. Dewey contended that one of the main objectives of education should be to promote the *democratic ideal*. He argued that a democratic society must be concerned with developing an educational system that is "deliberate and systematic" (p. 110). A democratic society, according to Dewey, one

which “is mobile, which is full of channels for the distribution of change occurring everywhere, must see to it that its members are educated to personal initiative and adaptability” (p. 111). In contrast to the democratic ideal, Dewey noted that “a society marked off into classes need be especially attentive to only the education of its ruling elements” (p. 111). From this perspective, the large numbers of minority students who fail to graduate from high school will be ill equipped to compete in terms of social mobility. America is indeed a democracy, and even if one rejects Green and Forster’s notion that our economy is becoming increasingly knowledge-based and thus requires a more skilled and sophisticated workforce, Dewey’s work reminds us that there is significant value in improving educational outcomes for *all* students in accordance with the democratic ideal which serves as a core principle on which this nation was founded.

In addition to concerns regarding the high school graduation rate and the overall percentage of students who leave high school prepared to succeed in college, the nation is also grappling with a persistent achievement gap between minority students and their White counterparts. In order to highlight this problem, the next section of this paper will examine the Black-White achievement gap, using data from the National Assessment of Education Progress (NAEP).

The Persistent Black-White Achievement Gap

Vanneman, Hamilton, Baldwin Anderson, and Rahman (2009), working with the National Center for Education Statistics, examined the Black-White achievement gap in mathematics and reading performance in grades four and eight, and presented data from two different assessment series: the National Assessment of Educational Progress (NAEP) long-term trend assessment and the main NAEP assessment. The intent of

examining this gap is to lend additional support to the notion that the nation's public schools are not serving all groups of students in an equitable manner.

In 2007, the NAEP reading assessment was administered on a nation-wide basis to 183,000 fourth-graders and 155,000 eighth-graders, while the NAEP mathematics assessment was administered to 190,000 fourth-graders and 147,000 eighth-graders. The report included public school results only. At the fourth-grade level, 16% of the assessed students were Black while 56% were White. At the eighth-grade level, 16% of the assessed students were Black and 60% were White. The study does not include data about students in other racial categories, e.g., Hispanic and American Indian. Vanneman et al. (2009) addressed two major questions:

1. How do gaps in 2007 compare to the gaps in the initial and most recent prior years of the NAEP national and state assessment series?
2. How do states compare to the nation in 2007?

It is important to understand that the NAEP data can identify gaps in performance, but they cannot explain why such gaps exist or why they may change over time. In addition, while the NAEP assessments measure student performance and can identify factors that are correlated with performance, the assessments cannot identify or explain the causes of performance gaps between groups of students (Vanneman et al., 2009, pp. 2-4).

The NAEP assessment results were calculated in terms of scaled scores, which range from 0 to 500. The mathematics assessment was first administered on a national basis in 1990, and the reading assessment was first administered in 1992. The most encouraging information in this report indicated that both Black and White students scored higher in 2007 than in any previous year dating back to 1990. However, despite

the progress of both groups, a significant achievement gap persists. In addition, it is important to note that a number of states have achievement gaps that exceed the national average. The data presented in Table 2-4 also serve to illustrate two additional points:

1. The gap has narrowed slightly over time, i.e., the gaps from prior years demonstrate statistically different – and larger – results ($p<.05$) when compared to the gap in 2007 (the most recent scores available).
2. While the gap has narrowed over time, it is still substantial.

While the Black-White achievement gap is certainly not a new phenomenon, it has received increased attention following the passage of No Child Left Behind (NCLB) in 2001. Noguera and Wing (2006) described this change as follows:

> What is new and different today is that such patterns are increasingly regarded as a problem that must be addressed rather than as a manifestation of the natural order of things. Even the fiercest critics of the Bush administration must acknowledge that despite its many flaws, No Child Left Behind has, in an odd way, moved the national conversation about race and education forward, because for the first time in our nation's history, schools are required to produce evidence that they can serve all students. (p. 7)

Table 2-4: NAEP main national results[a]: Comparison of results for Black and White students.

NAEP Main National Results: Mathematics for Black and White Fourth-Graders

Year	1992	2000	2005	2007
Avg. Black Score	192	198	220	222
Avg. White Score	227	231	246	248
Gap	35	33	26	26

NAEP Main National Results: Reading for Black and White Fourth-Graders

Year	1992	2000	2005	2007
Avg. Black Score	191	189	199	203
Avg. White Score	223	223	228	230
Gap	32	34	29	27

NAEP Main National Results: Mathematics for Black and White Eighth-Graders

Year	1992	2000	2005	2007
Avg. Black Score	236	243	254	259
Avg. White Score	276	283	288	290
Gap	40	40	34	31

NAEP Main National Results: Reading for Black and White Eighth-Graders

Year	1992	1998[b]	2005	2007
Avg. Black Score	236	242	242	244
Avg. White Score	265	268	269	270
Gap	29	26	27	26

[a]Because the NAEP data are presented in terms of average scaled scores, it is important to recognize that the data displayed above do not automatically represent differences in proficiency levels.
[b]Reading data were not collected for grade 8 in 2000; therefore, data from 1998 were included.

Summary: Why We Need to Reform Our Educational System

In summary, the work of Greene and Forster (2003) provided evidence that a large percentage of the nation's students, roughly 30%, do not graduate from high school in four years. While the authors did note that some of these students will eventually earn high school diplomas or general equivalency diplomas (GEDs) through other avenues, e.g., adult education programs, the overall graduation rate of approximately 70% is troubling. Moreover, as Greene and Forster demonstrated, only a little over one-third (36%) of all students who enter high school graduate four years later with sufficient coursework and skills required to be deemed college-ready. This does not bode well for a country that is becoming increasingly reliant on highly skilled workers in the current information age. In addition, these shortcomings of the nation's educational system are compounded by a major equity issue: minority students are not achieving the same outcomes as their White counterparts. Both Greene and Forster (2003) and Vanneman et al. (2009) demonstrated that large gaps, in terms of outcome measures such as graduation rates and performance on standardized assessments, persist between minority students and White students. As a result, minority students, with the notable exception of Asians, are poorly served by the nation's public schools, and far too many of these students are forced to accept a lifetime of limited employment opportunities and a dramatically reduced quality of life. In short, the system has failed to produce evidence that it can serve all students in an equitable manner. Finally, even if one completely the rejects the notion that the nation is placed in economic jeopardy by continuing to serve poorly large numbers of minority students, the present circumstances call for remediation in accordance with John Dewey's (Morris & Shapiro, 1993, pp. 110-120) democratic ideal.

An educational system which persists in tolerating a high dropout rate and an intransigent achievement gap is one which does not meet the true spirit of the democratic ideal because it perpetuates and even widens the divide between *haves* and *have-nots.* Dewey's ideal calls for a just educational system, one in which *all* individuals (regardless of race or social class) are offered realistic opportunities to pursue a viable economic future and to engage meaningfully in the democratic process. Hence, improving education for its own sake becomes a meritorious pursuit.

The preceding sections of this chapter provided an overview of the history of the largely failed efforts to reform schools since the late 1950s; described the importance of focusing reform efforts on the instructional core as opposed to tinkering with external structures outside of the core; introduced the PLC approach to school improvement and suggested that such an approach might be the most effective strategy for improving the nation's schools; provided a rationale as to why PLCs might prove to be effective because, unlike prior reform efforts, the PLC approach is designed to harness and employ the often latent power of social capital in order to have a direct impact on the instructional core; offered a conceptual framework for the present study built upon social capital theory and the communities of practice construct; and reviewed compelling evidence which suggests that the public schools, in global terms, are failing to meet the educational needs of all learners and failing certain groups of students at alarmingly disproportionate rates.

The final section of this chapter will examine the existing empirical research as it pertains to the impact of PLCs on teacher practice and student achievement. These two elements are linked to form the overarching theory of action driving the present study.

The theory of action is premised upon the notion that PLCs, by promoting regular and ongoing teacher collaboration, will result in improved teacher practice, thereby increasing student learning.

Empirical Studies Examining the Impact of PLCs and Teacher Collaboration on Teacher Practice and Student Achievement

Saunders et al. (2009) identified three problems with the existing research base:

1. Few studies have examined the impact of PLCs on student achievement.
2. With respect to PLCs that have been cited as effective, the *direction of effects* is not clear. In other words, did the implementation of PLCs actually cause student achievement to increase, or was the achievement increase due to faculty members who worked diligently to improve student achievement, and then morphed into a PLC – exhibiting the "psychosocial qualities" (p. 1009), associated with such communities – *after* their efforts started to show success. In making this second point, Saunders et al. drew heavily upon the work of Fullan (2000).
3. There is wide variation in the literature with respect to the definitions and practices associated with teacher-based learning communities.

Vescio, Ross, and Adams (2008)

Vescio et al. (2008) reviewed existing literature on professional learning communities and the impact of PLCs on teaching practice and student learning. They conducted a comprehensive search of websites including the Annenberg Institute for School Reform, the National School Reform Faculty, the Coalition of Essential Schools, and the Wisconsin Center for Education Research. In addition, Vescio et al. searched the ERIC and EBSCO databases for articles published from 1990 to 2005, using key words directly related to PLCs and teacher collaboration. Their search netted 55 articles, papers, or books that described attempts to relate PLCs to improved teaching practice and/or enhanced levels of student achievement. The authors then winnowed their initial collection to 11 studies that actually included empirical data. They reported the following: "In a general sense, all 11 research articles used in this analysis supported the

idea that participation in a learning community leads to changes in teaching practice" (p. 83). In addition, they noted that all 11 studies presented data suggesting that the professional culture of the schools that were examined had been changed by the existence of PLCs and that such learning communities were characterized by four broad categories comprising *collaboration*, *a focus on student learning*, *teacher authority*, and *continuous teacher learning* (pp. 84-86).

With respect to collaboration, Vescio et al. (2008) found that successful efforts in this area opened teacher practice to sharing, reflection, and risk-taking. Moreover, the authors found that throughout the studies they reviewed, teachers reported increased collaboration with other professionals as a result of their work in a PLC. They characterized this overall trend as a "change in teacher culture, which has traditionally been described as isolationist…" (pp. 84-85).

Vescio et al. (2008) posited that "in an educational climate that is increasingly directed by the demands of accountability, the viability of PLCs will be determined by their success in enhancing student achievement" (p. 86). To that end, they reported that eight of the studies they examined attempted to connect PLC work to improvements in student learning outcomes and that each of these studies reported increases in student achievement as a result of professional learning communities. However, in two of the studies (Supovitz, 2002; Supovitz & Christman, 2003), Vescio et al. noted that inconsistent student achievement results were observed. Moreover, the researchers who conducted these two studies attributed the inconsistent student achievement results to the lack of a clearly defined and unwavering focus on student learning by some of the teachers working within the various learning communities under examination. Another

key finding was that effective PLCs were characterized by a "persistent focus on student learning and achievement by the teachers in the learning communities. All eight studies documented that the collaborative efforts of teachers were focused on meeting the learning needs of their students" (p. 87). In summarizing the findings associated with their literature review, Vescio et al. stated:

> Participation in learning communities impacts teaching practice as teachers become more student centered. In addition, teaching culture is improved because the learning communities increase collaboration, a focus on student learning, teacher authority or empowerment, and continuous learning....when teachers participate in a learning community, students benefit as well, as indicated by improved achievement scores over time. All six studies reporting student learning outcomes indicated that an intense focus on student learning and achievement was the aspect of learning communities that impacted student learning. Together, these findings from the literature provide preliminary evidence of the benefit of learning communities for teachers and their students. (p. 88)

In concluding their work, Vescio et al. (2008) touched upon its limitations by noting the small number of studies that they reviewed and the possibility that the Hawthorne Effect (i.e., the observed changes in teacher practice and improved student achievement resulted from the participants' involvement in an innovative practice as opposed to their specific membership in a PLC) could explain the positive findings. Gall, Gall, and Borg (2007) provided the following description for the Hawthorne Effect:

> Any situation in which the experimental conditions are such that the mere fact that individuals are aware of participating in an experiment, are aware of the hypothesis, or are receiving special attention improves their performance. In education research, experimenters often give participating teachers and students special attention. This factor, not the experimental treatment itself, may cause a change in their behavior. (p. 390)

However, Vescio et al. cited four studies (Bolam, McMahon, Stoll, Thomas, & Wallace, 2005; Louis & Marks, 1998; Supovitz, 2002; Supovitz & Christman, 2003) that reported

a differential impact on teaching practice or student learning as a result of participation in a PLC, and they claimed that these findings would contradict the Hawthorne Effect.

Two of the studies reviewed by Vescio et al. (2008) were selected for further examination, primarily because these two studies reinforce the notion that collaborative teams must maintain a strong and consistent focus on instruction and student learning if such teams are going to make a positive impact on student achievement. In addition, these studies were longitudinal in nature; hence, the impact of collaborative teaming was studied over a significant period of time in each case.

Supovitz (2002)

Supovitz (2002) conducted a four-year evaluation of a district-wide teaming initiative in the Cincinnati, Ohio, Public Schools. The teaming initiative was based upon a theory of action that if schools implemented a team-based approach, teachers would develop enhanced collaborative cultures and improved instructional practices targeted to meet students' specific learning needs. The enhanced collaboration and instructional focus would then result in improved student learning outcomes. Supovitz provided an operational definition for team-based schooling: "a school reorganization strategy for which teams of academic teachers take responsibility for developing appropriate instructional strategies to improve the performance of groups of students whom they teach over multiple years" (p. 1593).

One key finding of the Supovitz (2002) study was that merely assigning teachers to teams and providing them with common meeting time was unlikely to improve instruction or student learning outcomes. While the team-based schooling initiative did have a clear impact on *school culture*, i.e., teachers felt more involved with school-based

decisions and collaborated to a greater extent, the cultural benefits did not translate into an enhanced focus on instructional issues. In fact, Supovitz estimated that only 25% of the team-based meeting time in the Cincinnati schools was devoted to teaching and learning, with the remaining time spent on paperwork, administrative issues, and student discipline issues. To expand on this point, it is important to note that Supovitz found the majority of the professional development available to teacher teams focused on *team processes* rather than *instruction and student learning*. In addressing this finding, Supovitz posited that the specific teacher actions required to improve student learning outcomes do not develop organically just because a district has created a structure for teaming. Moreover, Supovitz called for professional development that is *ongoing*, *content-based*, and *localized*, with a specific emphasis on "the ways that instructional strategies mix with curriculum to produce increasingly higher quality student work" (p. 1616).

Another key point offered by Supovitz (2002) is that the Cincinnati study reinforced the notion that traditional policy making is limited with respect to its impact on the instructional practices of teachers. The study suggested that this large-scale reform effort, while successful with respect to its impact on school culture, had a minimal impact on the content knowledge and pedagogical strategies of the district's teachers. This finding brings to mind the work of Elmore (2005), who argued that the theory of *loose-coupling* (i.e., the idea that the technical core of education lies within individual classrooms and that policymakers, board of education members, and administrators exist only to protect teachers from external interference) explains why "most innovation in schools, and the most durable innovations, occur in the structures that surround teaching

and learning, and only weakly and idiosyncratically in the actual processes of teaching and learning" (pp. 46-47). While Cincinnati, as a whole, did not experience significant increases in student achievement in its team-based schools as a result of the teaming initiative, Supovitz used hierarchical linear modeling to examine the relationship between individual team instructional practices and the achievement of students on each team. He found that, from an overall perspective, there was a "clear pattern of a relationship between the degree of team use of group instructional practices and student achievement….Although these effects are not huge, they do significantly distinguish between the student performance of high-practicing and low-practicing teams" (pp. 1613-1614). Finally, in expanding upon this empirical evidence, Supovitz noted that three key attributes of communities of practice were related to improved student performance:

1. Effective teams plan for instruction in a collaborative manner and use preparation for teaching as a learning opportunity. Moreover, teachers on an effective team analyze student work in relation to standards and examine how different instructional strategies produce different results.
2. Teachers on effective teams sometimes engage in co-teaching, they frequently observe other team members teach, and they foster a sense of safety with respect to this type of professional collaboration.
3. Effective teams "flexibly and purposefully regroup their students" (p. 1617), in order to maximize the strengths of individual team members and capitalize on the advantage of creating small groups for specific instructional purposes.

Strahan (2003)

Strahan's (2003) work was also cited by Vescio et al. (2008) and bears some similarities to the study conducted by Supovitz (2002). Strahan's findings reinforced the notion that collaborative work arrangements must maintain an unwavering focus on improving instruction in order to make a positive impact on student achievement. Strahan conducted a three-year qualitative study which explored the dynamics of school culture,

and the corresponding impact on student achievement, in three North Carolina elementary schools. He reported that from 1997 to 2002, student achievement at the three schools rose from under 50% reaching proficiency to over 75% as measured by state achievement tests.

The methodology for his study involved two phases. In Phase I, Strahan (2003) reexamined data collected by a team of researchers that conducted focus group interviews with 51 administrators, teachers, support staff, and parents at the three schools. In Phase II, Strahan conducted a follow-up round of data collection by interviewing the three school principals and asking them to nominate four teachers each. The nomination criteria comprised two factors: (a) higher than average student pass-rates on the state assessments and (b) demonstrated personal beliefs or professional characteristics, e.g., the ability to motivate students, valued by the school. Following the nomination process, Strahan conducted interviews with the 12 teachers, and also observed each teacher in two authentic situations: (a) teaching a classroom lesson and (b) participating in a meeting with fellow educators. Moreover, Strahan conducted an archival analysis of records, for example, minutes from team meetings and planning worksheets. In order to make sense of those data, Strahan used four guiding questions to code and sort information gleaned from the transcripts and the archival analysis. The four questions are listed below:

> How do participants (1) define success at their schools, (2) promote success in their classrooms, and (3) collaborate with colleagues toward continued growth? and (4) What types of support are necessary to sustain growth? (pp. 131-132)

Following the analysis, Strahan (2003) posited that the factors that most likely promoted enhanced student achievement in all three schools included the following:

- The ability of teachers and administrators to rally around a reform agenda that specifically addressed students' needs.

- The establishment of supportive relationships with students.
- The implementation of grade-level team meetings that provided a regular forum for identifying needs, sharing new ideas and developing strategies for improvement, and creating direct links between professional development initiatives and daily classroom practice. (pp. 141-142)

As was noted earlier, the comprehensive literature review performed by Vescio et al. (2008) covered studies spanning from 1990 to 2005. Therefore, it is important to examine work which occurred after this period. Four additional studies are examined in detail below:

Saunders, Goldenberg, and Gallimore (2009)

Saunders et al. (2009) conducted a quasi-experimental investigation which tested the effects on student achievement in elementary schools that had implemented grade-level teams focused specifically on improving instruction. The authors hypothesized that student achievement might improve if team meeting time were devoted primarily to addressing students' learning needs with less emphasis placed on non-instructional issues. Their hypothesis was based, to some extent, on their observation that, within schools, grade-level team meetings, faculty meetings, department meetings, and other types of group meetings among educators rarely appeared to focus on addressing students' academic needs and developing instructional strategies for addressing those needs. The grade-level teams examined at the treatment schools in the study analyzed student assessments, developed shared academic goals, planned instruction to address the goals, and reviewed student work that resulted from jointly planned instruction.

Saunders et al. (2009) reported on the quantitative differences between treatment and comparison schools on standardized achievement tests and a statewide academic performance index. The study was conducted in one administrative region of a large

urban district in Southern California, and it involved nine treatment schools and six comparison schools. The regional superintendent requested that the researchers name the project Getting Results (GR). All fifteen elementary schools in the study were part of the same school district; hence, both the nine GR treatment schools and the six comparison schools were required to follow consistent guidelines and policies related to assessment, curriculum, instruction, class size, and English language learner (ELL) programs. In addition, the two groups demonstrated statistical similarity with respect to demographic factors such as enrollment, poverty, percentage of Hispanic students (which was very large for both groups), and percentage of ELL students. To establish an initial baseline for comparing achievement in both the treatment and comparison schools, Saunders et al. used Stanford 9 Achievement Test (SAT-9) normal curve equivalent (NCE) scores in four sub-test areas: reading, language, spelling, and math. The researchers then employed independent group *t* tests to determine if significant differences existed between treatment and comparison schools at each grade level. Saunders et al. reported that none of the tests demonstrated statistically significant differences.

The study was implemented in two phases. In Phase I, which lasted for two years, training was limited to building principals in the nine GR schools who were supported as their schools implemented grade-level teams and school-wide Instructional Leadership Teams (ILTs). Grade-level teams were scheduled to meet on a weekly basis with support from an ILT member, while the ILT was scheduled to meet monthly at each school. In addition, principals were provided with protocols for their grade-level teams and ILTs, for example, approaches for analyzing student work to identify learning needs. All training was provided by project staff members (that included the researchers). Phase I

yielded no appreciable gains in student achievement. Saunders et al. (2009) posited that this result was due to minimal and ineffective implementation of the intended changes. Principals in the treatment group cited competing demands on their time and attention as the chief reason for the lack of progress. In summarizing Phase I, Saunders et al. stated "it became clear that a 'train the principal' approach yielded little implementation, ineffective teacher teams, or no gains in student achievement" (p. 1015).

In Phase II, which lasted for three years, project staff members continued running monthly GR principals' meetings; however, the focus of the meetings changed from implementation to specific discussions on the progress of grade-level teams and ILTs. Furthermore, during Phase II, strategies were shared across schools and additional interventions were carried out. Project advisors met monthly at each school with the principal, they attended the monthly ILT meetings at each school, and they attended grade-level team meetings on an as-needed basis at the request of the building principal or an ILT member. Annual summer (2.5 days) and winter (1 day) training institutes were offered, where focused professional development was provided. These institutes presented theory of action training (related to improving student achievement) for grade-level teams and introduced a published manual of protocols for work in the following areas: analyzing formative and summative assessment results, instructional planning, and addressing students' learning needs. The institutes were planned in advance using the monthly principals' meetings, and the participants included principals, content-area coaches, and grade-level teachers. According to the Saunders et al. (2009), the additional support measures provided during Phase II constituted a significant increase in external assistance for the nine GR treatment schools.

Saunders et al. (2009) analyzed the results of the state-mandated SAT-9 (a standardized, norm-referenced achievement test) which was administered to all students in grades two through five in both the treatment schools and the comparison schools. The authors reported that this test meets "customary standards for reliability and validity" (p. 1017). A summary *z* score was calculated for each school during each year of the study in order to compare change, over time, between SAT-9 scores in treatment schools and comparison schools. In addition to analyzing results from the SAT-9, Saunders et al. also examined State Academic Performance Index (API) results. The API was developed by the California State Department of Education and yields a single-numeric, composite index of school-level achievement that is used to measure school growth toward designated improvement targets. API scores range from 200 to 1,000, and the authors reported that the state deems a score of 800 indicative of acceptable performance. Saunders et al. indicated that they used API scores in this study for two reasons:

1. Disaggregating APIs by demographic sub-group allowed them to report results for Hispanic students, who were the predominant population in both the GR treatment schools and the comparison schools.
2. The API is generated annually and serves as a measure of school progress in relation to state averages because each school is re-ranked on a yearly basis. In other words, to preserve its ranking, a school must keep up with the rate of growth throughout the state; to move up in the rankings, a school must surpass the state's rate of growth.

Saunders et al. employed a repeated-measures ANOVA to compare changes in API results over time between treatment schools and comparison schools.

In addition to the quantitative analyses, Saunders et al. (2009) reported that an external evaluator conducted a formative evaluation of the Getting Results project during its final year. The evaluator used focus groups, interviews, and observations to assess the fidelity of implementation of the GR approach in four treatment schools and also

examined similar processes in three of the comparison schools. The external evaluator determined that the ILTs and grade-level team meetings in GR schools were more focused on student achievement, collaborative planning, the purposeful use of multiple forms of assessment, and forging agreements on implementing and evaluating goal-directed instruction. In contrast, meetings in comparison schools were characterized by a greater emphasis on site-based governance and a reduced focus on improving teaching and learning. Saunders et al. also conducted a case study of one GR treatment school and found a greater focus on instruction during ILT and grade-level meetings. Saunders et al. reported that the results from both of these qualitative investigations suggest a "significant degree of implementation of intended changes in grade-level focus over time in some of the nine experimental schools" (pp. 1020-1021); however, they also cautioned that the two qualitative investigations do not indicate whether the treatment resulted in any changes with respect to instruction or student achievement.

Saunders et al. (2009) submitted key results from the SAT-9 quantitative analysis as follows:

1. There was general improvement in the district's average student achievement, relative to state results, during the five-year period of the study.
2. The nine treatment schools, which all started well below the district average, surpassed the comparison schools and the district average by the end of the study.
3. No impact on achievement was noted during the first two years (Phase I) of the project; however, an impact did appear during the final three years (Phase II).

With respect to the third finding, as was mentioned earlier, Saunders et al. noted that the limited scope of Phase I resulted in poor implementation of the intended changes at the school sites. During Phase II the project was expanded to include summer and winter

institutes; explicit protocols for the facilitation of ILT and grade-level team meetings; and direct, on-site support for principals, content area coaches, and grade-level teachers. The authors posited that the expanded support during Phase II of the project contributed to the improved SAT-9 results in the treatment schools.

Saunders et al. (2009) reported that the API scores provided another estimate of the Phase II effects. The repeated-measures ANOVA testing was conducted for treatment and comparison schools during Phase II and yielded a "significant time-by-group interaction, $F(3, 39) = 5.015$, $p > .01$, indicating that GR schools' improvement surpassed that of the comparison schools" (p. 1023). In addition, the ability to disaggregate API scores by demographic sub-groups allowed the researchers to examine the impact of the treatment on Hispanic students, who constituted, on average, 69% of the enrollment at the treatment schools and 83% of the enrollment at the comparison schools. Saunders et al. reported that during the three years of Phase II (1999-2002) the average API score for Hispanic students at the treatment schools increased 189.7 points as opposed to average growth of 111.7 points for Hispanic students in the comparison schools. Finally, as was noted earlier, the API is used by California to produce statewide rankings on an annual basis. After all elementary schools are ranked, the state breaks the entire group into deciles, with 10 representing the highest performing 10% of schools and 1 designating the lowest 10%. Saunders et al. reported that at the end of Phase I, the average decile ranking for the treatment schools (2.1) was nearly identical to that of the comparison schools (2.0). By the conclusion of Phase II, the average ranking for the treatment schools had increased to 3.8 versus 2.3 for the comparison schools. These results suggested that the treatment schools had made significant progress with respect to

increasing their relative standing among all other schools within the state. In their discussion of the results of this quasi-experiment, Saunders et al. noted three limitations:

1. The nine elementary schools which constituted the treatment group were participating on a voluntary basis; hence, the authors posited that the staff members in these schools were likely more willing to accept the interventions – particularly those included in Phase II. The authors noted that results could certainly vary for schools that were mandated to participate in the creation of ILTs and grade-level teams. Moreover, they noted that an insufficient data base exists with respect to relative achievement gains in volunteer versus mandatory samples.
2. The study was limited to elementary schools; hence, the results are not generalizable to secondary schools, where work of this nature would most likely occur with subject-specific teams, e.g., Algebra I teachers.
3. During Phase II of the study, all nine experimental schools received direct support from the researchers. Saunders et al. cited a number of other studies (Borman, Slavin, Cheung, Chamberlain, Madden, & Chambers, 2005; Cronbach et al., 1980; Lipsey, 2003) in noting that work supported by the research team as part of the programmatic implementation generally results in larger effect sizes (pp. 1026-27). However, while addressing this limitation, Saunders et al. maintained that "even a halving of effect would still rank the GR intervention in good company" (p. 1027).

In summary, the results of the quasi-experimental trial conducted by Saunders et al. (2009) suggested that significant student achievement gains were made in elementary schools when grade-level teams met on a consistent basis, when they received school-wide instructional leadership, and when they used explicit protocols that focused meeting time on identifying students' learning needs and developing instructional strategies to meet those needs. In addition, the authors found strong evidence which suggested that attempts to introduce grade-level or school-based teams focused on improving instruction and student achievement are not effective when training is limited to in-services for principals, with the corresponding expectation that the principal take sole responsibility for implementing such teams within the school. As Saunders et al. noted, the Phase II augmentations – including summer and mid-year institutes; explicit protocols for key

team processes, e.g., examining student work; and external, site-based support for principals, content area coaches, and grade-level teachers – contributed to significant gains in student achievement.

Goddard, Goddard, and Tschannen-Moran (2007)

Goddard et al. (2007) examined the relationship between teacher collaboration for school improvement and student achievement. In presenting their findings, the authors noted that while the benefits of teacher collaboration have been advocated frequently, the effects of such collaboration have been investigated far less often. This gap in the existing body of research served as the primary driving force for their work; thus, Goddard et al. designed their study specifically to test whether teacher collaboration predicts variations among schools in student achievement. In their review of the literature, Goddard et al. grounded their research question in the theoretical rationale that when teachers collaborate on issues of instruction, both teaching and learning are enhanced.

Goddard et al. (2007) employed hierarchical linear modeling (HLM) as their primary analytic method. The authors reported that their study was naturalistic and involved secondary data analysis; hence, there was no randomization, treatment, or intervention. The sample for this study included 47 elementary schools with 452 teachers and 2,536 fourth-grade students. All of the schools were located in the same large, urban district in the Midwestern United States. Individual elementary schools served as the unit of analysis. Approximately two months prior to mandatory state assessments, survey data were taken from teachers using a six-item, Likert-type scale. These data were used to calculate a factor score for each school which operationalized “teacher collaboration for

school improvement" (Goddard et al., p. 888). Hence, this operationalized construct served as the independent variable. Student achievement was measured at the fourth-grade level by performance on state-mandated assessments in reading and mathematics. Scaled scores on these assessments served as the dependent variables in the study. In addition, the researchers employed statistical control measures for the following variables: gender, race/ethnicity, free/reduced-price lunch, and prior student achievement. Goddard et al. explained that they used HLM because the data were *nested* and the primary research question involved the effects of school-level practices on students. Their model enabled them to test teacher collaboration for school improvement as a predictor for variations among schools in student achievement.

After conducting their analysis, Goddard et al. (2007) reported that teacher collaboration for school improvement served as a statistically significant, positive predictor of variation among schools with respect to student achievement in both mathematics and reading. They found that a one-standard-deviation increase in teacher collaboration was associated with increases of .08 *SD* in mathematics achievement and .07 *SD* in reading achievement at the school level. Although they cautioned that the relationship they noted was moderate, Goddard et al. stated that the finding is important "given that most prior research on teacher collaboration has considered results for the teachers involved, rather than student level outcomes" (p. 891). In addition, the authors noted that the study was naturalistic, that is, they did not examine the impact of a specific initiative or program designed to enhance teacher collaboration for instructional improvement among teachers. In expanding upon this point, Goddard et al. suggested that

"systematic efforts to enable collaboration among teachers may be rewarded with improved student achievement" (p. 892).

It is important to note that the results from this study have limited generalizability because the sample was restricted to elementary schools in one district, the measures of the dependent variables were generated at the fourth-grade level only, and each of the schools in the study served a predominantly minority population with roughly 67% of the students qualifying for free or reduced-price lunch. Goddard et al. (2007) suggested that future studies may benefit from research designs that glean data from populations that are more representative in terms of grade levels, student demographics, and social context. Nevertheless, as the authors noted, the findings do suggest that focused teacher collaboration may improve schools' efforts to increase student achievement. In addition, the authors suggested that the relationship between teacher collaboration and student achievement is most likely indirect. In other words, Goddard et al. asserted that the most valuable product of teachers' collaborative efforts probably lies in the area of improved instructional practice, and that the improvements in instruction then result in increased student achievement. In summarizing this point, the authors stated, "it is not unreasonable to speculate that the explanation for our results is that teacher collaboration fostered learning that improved instruction" (p. 892).

Wood (2007)

Wood (2007) examined the implementation of teachers' learning communities (LCs) in five schools (three elementary, one middle, and one high) located in a district of approximately 11,400 students in the mid-Atlantic United States. Each of the five schools was grappling with low student test scores. The district was characterized by rapidly

changing racial demographics, disparities in wealth between different groups of residents, economic uncertainty, and a pronounced achievement gap between middle class children and economically disadvantaged children. At the time the study was conducted, the district's student body was approximately 43% Hispanic, 32% White, 22% Black, and 3% Asian or other ethnic groups. In order to protect the confidentiality of the subjects involved in the study, the district was assigned the fictitious name of Hillsboro. Wood's research methodology was primarily qualitative in nature, involving on-site visits, focus groups, observations of LC participants' meetings and classrooms, observations of professional development sessions, and document analyses. In addition, the field-based data were compared with survey data collected from 251 respondents who participated in the learning communities.

Wood (2007) described the early stages of the Hillsboro LC project as follows:

> The Learning Communities Project evolved out of the foundational idea that teachers working in the professional learning communities who share expertise are more likely to improve student learning than teachers working alone. Built into this notion is the idea that practitioner expertise and collaboration *matter* and that school cultures need to be re-imagined and reconfigured so that both can flourish. (p. 711)

From its outset, the initiative was launched in partnership with private business firms that provided financial support for such expenses as professional development and substitute teachers. In addition, the district received considerable support from the National School Reform Faculty (NSRF), which provided direct training for district faculty and administrators and an external coach responsible for advising the district's leadership team throughout the implementation of the initiative. Hillsboro's superintendent, characterized by Wood as strong and visionary, played a key role in the implementation of LCs. The superintendent clearly articulated her expectation that staff must bear the

responsibility for improving student learning, and she viewed the LC initiative as having the potential to build organizational capacity and raise students' test scores. It is important to note that the Hillsboro LC project involved a retooling of the manner in which professional development was delivered. Instead of conducting professional development sessions in traditional, large group in-services, Hillsboro's leadership team opted purposefully to embed teacher learning experiences within the individual practitioner learning communities.

In advocating for the creation of learning communities as a powerful intervention for improving student achievement, Wood (2007) argued that such an approach requires a fundamental shift in the way that the work of classroom teachers is conceptualized. The traditional paradigm for schooling conjures images of the "egg crate" (Lortie, 1975, p. 14), metaphor and a top-down, rigid hierarchical structure where administrators protect the uncertain work of classroom teachers from outside influences without impacting the technical core of teaching and learning (Elmore, 2005). In sharp contrast to this conventional structure, which promotes teacher isolation and the sharp division of labor between administrator/managers and classroom teachers, lies the learning communities approach. Wood described this shifting paradigm as follows:

> To re-conceptualize teachers' work in these ways requires a professional development agenda that doesn't simply equip teachers with techniques, but widens their professional responsibility and hones their professional judgment. It is an agenda, much like that of other self-regulating professions, to foster commitment, autonomy, collegiality, and efficacy. Such an approach to the profession, however, runs counter to well over a hundred years of public school practices, where teachers are likely to be rewarded for compliance and conformity than for critical dialogue, inquiry, and innovation. (p. 709)

In its implementation of the LC project, the Hillsboro district relied heavily on protocols, many of which were established by the NSRF. According to Wood (2007), the

use of protocols allowed staff to make their collaborative exercises reflective and action-oriented, providing structure to professional conversations. In addition, protocols addressed a wide variety of collaborative possibilities, and in a general sense they served to enhance the focus, the equity, and the productivity of team meetings. Such efficiency carried particular significance in light of the demanding and extremely busy schedules of the public school practitioners examined in this study. Moreover, as Wood argued, "Teacher talk in typical faculty rooms rarely approaches the kind of professional collaboration that protocols are meant to evoke" (p. 722). However, Wood cautioned that coaches and other LC leaders must understand the theoretical underpinnings of LCs in order to employ protocols appropriately and with purpose, lest their use devolve into a series of exercises, prescriptions, and recipes that call for compliance rather than professional judgment. In addition to the use of protocols, the Hillsboro LC initiative also benefited from the fact that resources were earmarked specifically for hiring substitute teachers. The substitutes provided release time for LC participants, who were able to meet and/or participate in professional development training during the work day. The project also benefited from the regular presence of an outside coach from NSRF. The NSRF coach worked to solve group conflicts, she provided professional resources on relevant topics, and she assisted LC coaches with improving their facilitation skills. Finally, summer institutes were conducted preceding years two, three, and four. The institutes focused on skill development for working with protocols and enhancing the leadership skills for LC coaches. Wood reported that the end result of these efforts was a significantly enhanced level of district capacity, and as qualitative evidence for this

assertion Wood reported the superintendent's perspective that the initiative was improving the capacity of the staff to be *inquiry based*.

As mentioned previously, Wood (2007) collected survey data as a component of her research methodology. A total of 251 respondents (comprising 218 participants and 33 coaches) were surveyed. Wood asked respondents to indicate if they had engaged in specific professional activities twice per month before the implementation of the LC project; she also asked respondents to indicate if they engaged in the same activities twice per month following the implementation of the LC project. The professional activities and the corresponding percentages are listed below:

- More collegial conversations (84.1% prior; 92.8% after).
- More feedback on professional performance from colleagues and more useful suggestions to improve practices (36.6% before; 54.1% after).
- More discussions focused on student work samples (44.3% before; 61% after) and assignments, and lesson plans (56.6% before; 69.9% after).
- More discussions about dilemmas of practice (54.4% before; 72.2% after). (p. 716)

Wood (2007) also used a 5-point Likert scale to determine whether certain elements related to professional learning communities existed to a greater degree before or after the LC project. High ratings were defined as a score of 4 or 5. The elements and corresponding percentages are listed below:

- Increased trust among professional colleagues (42.2% before; 51.9% after).
- Better understanding of how to meet student needs (59.3% before; 73.1% after).
- A district climate more conducive to risk-taking and innovation (59.4% before; 70.7% after).
- A greater sense of professional efficacy to improve student learning (44% before; 50% after). (pp. 716-717)

Wood (2007) pointed out a number of important themes which emerged from her research. She noted that participants in the Hillsboro project found LCs to be more

effective than other types of professional development, and she reported that principals indicated teacher collaboration builds leadership. Moreover, Hillsboro principals indicated that when teachers collaborate successfully and are given opportunities to frame their own professional problems and attack them, teacher efficacy is enhanced. Wood also found that some teachers and administrators felt the LC project resulted in surface-level or superficial changes only and failed to impact practice, existing more at the level of perception than in actuality. These educators expressed concern that the initial excitement and enthusiasm regarding the project might devolve to a sense of disappointment or even cynicism. Moreover, most respondents felt that it was "too early" (Wood, p. 717), to determine whether the LC work had an impact on classroom practice and student learning. According to Wood:

> The LC initiative walked a tightrope between redefining the work of teaching or using a new structure to do business as usual. At stake, of course, was whether the LCs would truly fulfill their culture-changing potential and actually foster in teachers sufficient responsibility, efficacy, and authority to improve student learning. (pp. 717-718)

Moreover, Wood posited that making public the practice of teaching is a risky and anxiety-laden venture for educators in today's climate of accountability, and that initiatives such as the Hillsboro LC project "can be regarded with suspicion, particularly by teachers who have seen a series of reforms come and go, and who believe that the only modicum of control and efficiency that they have comes with shutting the classroom door" (p. 718).

Citing the work of Wenger (1998), Wood (2007) drew an important distinction between two dimensions of collaboration: relationship or community building and purposeful efforts to improve teaching and learning. As Wood noted, in the effort to

improve student achievement through collaboration, attention must be paid to both community building and instructional practice. In summarizing this point, Wood stated the following:

> The LCs, whose work is truly focused on student learning, reject the dichotomy between building relationships and accomplishing work….[T]hey recognize that attempts to build trust and openness without a focus on collective professional commitments simply devolve into superficial small talk without real focus or purpose. (pp. 723-724)

In discussing her findings regarding the Hillsboro LC project, Wood (2007) reported that the initiative was driven by the following vision, or theory of action: "Student learning would improve if educators worked together to ensure quality instruction and student work carefully aligned with high standards" (p. 730). According to Wood, the vision appeared to have permeated the district's culture and instilled a "can-do" (p. 730), attitude into a previously demoralized organization. However, not all educators in the district shared the sense of optimism regarding the LC initiative, and some regarded the district's new change efforts with skepticism. In addition, some educators shared frustrations regarding the fact that LC meetings and agendas were frequently interrupted by district work coming from the central office, including last-minute mandates to examine data related to standardized assessments. In addressing this dilemma, Wood posed the following question: "Is it possible to successfully implement, sustain, and take seriously professional learning communities for teachers if the bottom-line arbiters for the quality of teaching and learning are standardized tests?" (p. 732).

From a systemic perspective, Wood (2007) indicated that the successes of the Hillsboro LC project certainly outweighed the negatives during the first two years of implementation. Some LCs improved dramatically with respect to analyzing and

assessing student work and providing critical feedback on professional practices. The Hillsboro district made significant progress with respect to institutionalizing LCs; moreover, the LCs had "planted seeds" (p. 733), within the district's culture which ensured that Hillsboro would be poised for substantial and meaningful change in the near future. However, at the end of year two, the district also experienced a significant change in leadership as the superintendent, who had been a strong proponent of the LC project, accepted a position with the state department of education. According to Wood, the new superintendent placed a strong emphasis on student test scores, and following the leadership change, many schools reconfigured their LCs to focus exclusively on improving standardized assessment performance.

In concluding her research on the Hillsboro LC project, Wood (2007) made a series of recommendations. These recommendations have been summarized below:

- The rationale behind NSRF protocols needs to be explored during staff development and LC meetings so that educators understand *why* LCs have the potential to improve student achievement. Without grasping the theoretical constructs underpinning the work of LCs, educators run the risk of viewing protocols as the focal point of meetings as opposed to tools designed for a specific purpose. In other words, educators must understand that the quality of their collaboration and team-based inquiry, rather than their skill in using protocols, is what truly matters.
- Because LCs invariably contradict the traditional norms of school culture, their countercultural nature needs to be stressed with LC coaches during staff development sessions. Training should involve specific discussions on how LCs may be perceived as a threat to existing power structures within the district.
- LC training should address critical insights into the ambiguities and predictable barriers inherent within all school reform efforts. LCs are not immune to forces that thwart other change initiatives, and coaches must be made aware of such obstacles in order to prevent LCs from failing.
- Case studies for future staff training sessions should be developed from the authentic experiences of LC coaches and participants. Such case studies would be beneficial to future coaches and participants. Moreover, they would provide trainees with the opportunity to learn about the inevitable challenges

and frustrations involved with the implementation of LCs, and the ways in which colleagues handled or failed to handle such challenges.

- LC participants, primarily teachers, require time and space to develop their own agendas and follow through with them. If LCs serve as a means by which teachers take ownership for the quality of instruction that occurs within their classrooms, and if LCs also promote the ideal that teachers must accept responsibility for ensuring that all children learn, then administrators must refrain from conflating the work of LCs with other reform efforts.
- Early in the process, LC training should link *team building* and the work of *improving teaching*. LC participants should reject the notion that building relationships within a team must occur separately from collaborative work focused on improving instruction and student learning. In fact, ice-breakers and other, strictly team building exercises should never occur in isolation. Such interactions should instead be followed by specific, work-related activities such as analyzing student work and assignments, reviewing exemplar lesson plans, or addressing problems of practice.
- The LC initiative must be provided with adequate time in order to allow it to succeed. In addition, administrators should commit to maintaining LC membership from year-to-year, restricting the size of the groups, and ensuring that LC meetings occur more frequently than once per month. The quality of relationships, the scope of collaborative work, and the ability to engage in shared inquiry regarding common problems of practice thrive when these conditions are met. In order to achieve this goal, administrators will need to avoid interruptions and cancellations (Wood, pp. 734-736).

Leana and Pil (2006)

Leana and Pil (2006) examined social capital and its relationship to organizational performance. Their work is particularly relevant, because social capital theory is integrated with the communities of practice construct to establish the conceptual framework which guides this dissertation. Leana and Pil defined social capital as "the actual and potential resources embedded in relations among actors" (p. 353). The researchers designed their study to test the following four hypotheses:

(H1): Higher levels of internal social capital within a school will be associated with higher levels of school performance.
(H2): Higher levels of external social capital for the school will be associated with higher levels of school performance.
(H3): The quality of instruction in the school will mediate the relationship between internal social capital and student achievement.

(H4): The quality of instruction in the school will mediate the relationship between external social capital and student achievement. (pp. 355-356)

The study was conducted during an 18-month period from 2000 to 2002 in an urban public school district serving approximately 38,000 students in the northeastern United States. The district employed approximately 5,200 individuals and consisted of 95 schools, 88 of which participated in the study for a participation rate of 93%. The researchers reported that the district served a predominantly minority (over 60%) and low-income (over 65% eligible for free or reduced-price lunch) population of students, and that approximately 17% of the students were eligible for special education services.

Leana and Pil (2006) employed a mixed-methods approach. In terms of qualitative methodology, semi-structured interviews were conducted with a sample of district administrators, principals, and teachers in order to gain perspective on the working environment, the existing social connections and interactions, and linkages with external actors. Additionally, the research team participated in a series of *learning walks* in the schools to develop an enhanced perspective on the instructional practices within individual classrooms and schools as a whole. Finally, a number of focus groups were conducted with principals and teachers who represented urban districts from throughout the United States in order to assist the research team with constructing its quantitative measures.

The first quantitative measure consisted of a survey distributed to all teachers in the district. Staff from 94 of the 95 schools participated in the survey, and the researchers collected responses from 2,167 teachers for a response rate of 80%. The teacher surveys were used to assess the existence and strength of internal social capital within each individual school. The structural element of social capital was operationalized as the

degree of information sharing among teachers, the relational aspect was operationalized as the degree of trust among teachers, and the cognitive element was operationalized as the degree of shared goals and vision present within the school. The researchers reported that they averaged the level of information sharing, trust, and shared vision within each school to establish a measure for internal social capital; moreover, they addressed the issue of whether the aggregation of teacher perceptions could be empirically justified by employing the ANOVA test for the individual teacher responses, with the school serving as the independent variable and the social capital constructs serving as the dependent variables. Leana and Pil (2006) reported that the resulting intra-class coefficients for both the overall social capital construct, and its three elements – trust, shared vision, and information sharing – were greater than zero and that the *F*-statistic was significant. Moreover, the reliability of the school mean was established after their test yielded coefficients of 0.85 for information sharing, 0.90 for shared vision, 0.88 for trust, and 0.91 for the overall social internal capital construct.

The second quantitative measure involved a parent survey, conducted by the district, which yielded 5,130 respondents for an overall response rate of 23%. Leana and Pil (2006) used information gleaned from the parent survey to develop an average measure of perceived instructional quality at each individual school. Three items were used to assess instructional quality: parental satisfaction with teaching methodology, parental satisfaction with instructional materials, and parental satisfaction with opportunities for their children to learn. Leana and Pil reported that the average parent rating for these items was 3.9 (sd = 0.28) on a five-point scale with 1 indicating *very dissatisfied* and 5 indicating *very satisfied*. The authors reported that the *Cronbach's* α

statistic (used to measure internal consistency) for the three items was 0.94. Moreover, the intra-class coefficient for the school mean was reported at 0.71, just exceeding the acceptable threshold of 0.70. It is important to note that instructional quality served as the mediating variable for both H3 and H4.

The third quantitative measure was developed by Leana and Pil (2006). They labeled this measure a *time diary methodology* which was designed to track the specific activities of principals during a one-week period. Each principal was asked to record his or her daily activities at two-hour intervals throughout the workday in a *Palm Pilot* device. The researchers used this information to measure external social capital by calculating the amount of time that principals spent interacting with external actors. Three main activities or behaviors were identified as linking principals to external stakeholders: (a) activities designed to acquire additional resources, such as making connections with foundations or corporate sponsors; (b) activities focused on developing relationships with parents; and (c) activities designed to foster positive relationships with the community, such as participation in community-wide events.

Leana and Pil (2006) measured school performance by examining the percentage of students in each school that met or exceeded state standards in mathematics and in reading on the state-mandated assessments in grades 5, 8, and 11. In addition to examining absolute levels of student performance, the researchers also tracked changes over time to measure improvement from one year to the next; moreover, tracking performance from year to year enabled Leana and Pil to assess the extent to which both internal and external social capital influenced school performance over time. Achievement scores were examined for the school year prior to the study (1999-2000),

for the focal school year of the study (2000-2001), and for the school year following the study (2001-2002). In addition, achievement scores were correlated with measures for internal and external social capital for the focal year of the study and for the following year. With respect to control variables, the researchers controlled for socioeconomic status (SES) and teacher experience.

In analyzing their results, Leana and Pil (2006) found that internal and external social capital are both significantly correlated with student achievement test scores in mathematics and in reading. The correlations for internal social capital and the achievement measures ranged from 0.25 ($p \leq 0.05$) for mathematics in 2001-02 to 0.50 ($p \leq 0.01$) for reading in 2000-01. The correlations for external social capital and the achievement measures ranged from 0.23 ($p \leq 0.05$) for mathematics in 2000-01 to 0.28 ($p \leq 0.05$) for mathematics in 2001-2002. Leana and Pil also examined the relationship between social capital and student achievement using hierarchical regression techniques and they factored in a variable which accounted for the total amount of time spent working each week by the school principal. For the regression model, mathematics and reading scores were correlated with the two control variables (subsidized lunch and teacher experience) and the three independent variables (internal social capital, external social capital, and the principal's time spent working each week on the job). According to the researchers, the social capital measures added significant power to the model, accounting for 18% of the variance in reading performance and 9% of the variance in mathematics performance. Leana and Pil reported that the results suggest a significant relationship between internal and external social capital and student performance.

However, they also acknowledged that the results fail to explain the direction of causality.

Leana and Pil (2006) conducted a final analysis to assess whether instructional quality serves as a mediating variable in the relationship between social capital and student achievement. In other words, the researchers wanted to determine if both internal and external social capital (two independent variables) impacted instructional quality (the mediating variable), which in turn might impact student achievement (the dependent variable). As the researchers stated, "the argument is that internal and external social capital do not directly affect student achievement but instead operate through the mediating effect of teacher instruction" (p. 361). Using a *t*-test, Leana and Pil found that instructional quality significantly mediated the relationship between both forms of social capital and student achievement in mathematics, but not in reading. As they noted, the researchers were initially surprised by this finding, because the results suggested that both forms of social capital actually had a direct impact on reading achievement and that instructional quality did not serve as a mediating variable. In their attempt to explain this finding, Leana and Pil suggested that collective efforts to improve math typically focus on specific instructional practice and content material (hence, the importance of instructional quality as the mediating variable), whereas collective efforts to improve reading are typically spread across a school and attempt to embed support for literacy across a broad range of content areas versus focusing on specific instructional strategies.

In their discussion regarding the results of their research, Leana and Pil (2006) noted that "social capital plays an important role in predicting organizational performance in urban public schools" (p. 362). Specifically, they found that social capital

has a direct impact on reading achievement and impacts math achievement through the mediating variable of instructional quality. Leana and Pil also noted that their results indicated that teacher experience predicted student achievement in reading but not in math, and they suggested that this difference might be the result of recent and very significant changes in instructional approaches to math during recent years whereas instructional practice in reading has not shifted as dramatically over time. In addition, Leana and Pil posited that both forms of social capital (internal and external) are important contributors to organizational performance and that their social capital model should be extended beyond education to other sectors.

Several important limitations were noted by Leana and Pil (2006); moreover, the authors made a number of recommendations for future research. The first limitation involved the fact that the research was conducted in a non-profit setting, that is, public schools, and Leana and Pil indicated that many other studies of social capital have occurred in for-profit settings, so generalizability was limited. (In addition, the research was conducted in an urban school district, which would limit the generalizability to school districts serving other types of communities.) They suggested that future researchers may wish to examine "both internal and external social capital as drivers of performance across a large number of organizations" (p. 364). A second limitation involved the measures used, including the measure for instructional quality which relied on parental surveys. As the authors noted, their measure for instructional quality was "not as rich as the qualitative assessments more commonly used in education research" (p. 364). Leana and Pil recommended that future research might develop a "richer measure of classroom activity and practices that comprise this construct that can be used over a

large number of schools and classrooms as we did in this research" (p. 364). A third limitation resulted from the data gathered in the study, which did not permit multi-level modeling because student achievement scores were available only at the aggregate level. Leana and Pil recommended that future researchers may wish to employ multi-level analysis in terms of examining disaggregated student achievement data. Finally, the authors indicated that their research defined the organization as a whole as the unit of analysis. Leana and Pil suggested that teachers can participate in multiple communities, even within a single school, and that future researchers might wish to examine "the overlapping influences of these communities" (p. 364), with an eye toward developing a deeper understanding of the influence of social capital on student achievement in schools, as well as the broader relationship to organizational performance.

Summary of Findings—Empirical Research on the Impact of PLCs

This literature review established that several consistent themes have emerged from the empirical research which has been conducted regarding the impact of PLCs on teacher practice and student achievement. First, few studies have been conducted in this area. Second, with respect to the studies that have been cited, the direction of effects regarding the interaction of PLCs and student achievement is not clear. Third, there is considerable variation in the existing literature base regarding the definitions and practices associated with teacher-based communities focused on the improvement of student learning.

However, preliminary evidence does exist with respect to the impact of PLCs on student achievement. Vescio et al. (2008) found that when teachers who participate in PLCs are focused intensively on student learning and achievement, teaching practice

changes and the resulting changes in teacher practice have a positive impact on student learning outcomes. This finding carries particular relevance with respect to the focus of this dissertation, which addresses research questions regarding the impact of PLCs on changes in teacher practice and improvements in student learning. Vescio et al. examined work from 1990 to 2005, and two of the studies they reviewed (Strahan, 2003; Supovitz, 2002) were presented in greater detail in this review of the literature. Moreover, four additional studies that were conducted after 2005 were reviewed (Goddard et al., 2007; Leana & Pil, 2006; Saunders et al., 2009; Wood, 2007).

Most notably, each of the studies summarized in this review of the literature reinforced the notion that collaborative teams must maintain a laser-like focus on high quality instruction in order to impact positively student achievement. While this theme was addressed consistently in every study, other important themes emerged as well and each of these themes carries significant implications for practitioners interested in introducing professional learning communities into their schools. These other important themes are listed below:

- The creation of regularly scheduled meeting time for teacher teams (Saunders et al., 2009; Strahan, 2003; Supovitz, 2002; Wood, 2007).
- The establishment of a shared vision focused on improving student learning outcomes (Saunders et al., 2009; Strahan, 2003; Wood, 2007).
- A specific emphasis on analyzing student work in order to identify students' needs and modify instructional practice accordingly (Saunders et al., 2009; Strahan, 2003; Supovitz, 2002; Wood, 2007).
- Success in "deprivatizing" or "opening up" teacher practice so that teachers become comfortable observing one another and providing critical feedback (Supovitz, 2002; Wood, 2007).
- The use of specific protocols to structure regular meeting time with a focus on developing instructional strategies to meet the needs of students (Saunders et al., 2009; Wood, 2007).

In addition to the preceding themes, Supovitz (2002) and Wood (2007) identified an important distinction existing with respect to the team meeting component of PLCs. Both researchers described the difference between *relationship building and team processes,* on the one hand, and a specific focus on *instruction and student learning,* on the other. Supovitz cautioned that the specific teacher actions required to improve student learning outcomes do not develop organically just because a team has been provided with regular meeting time, and he called for professional development that explicitly addresses the interaction of instructional strategies and curriculum. Wood acknowledged the difference between the two constructs; moreover, she argued that attention must be paid to both relationship building and instructional practice and that learning communities that are truly focused on student learning "reject the dichotomy between building relationships and accomplishing work….they recognize that attempts to build trust and openness without a focus on collective professional commitments simply devolve into superficial small talk without real focus or purpose" (pp. 723-724).

Attempts to introduce a PLC initiative through a train-the-principal model failed to yield improvements in student achievement because principals reported too many other demands on their time. However, when the PLC initiative was expanded to include site-based coaching, as well as training and support for content-area coaches and grade-level teachers, significant gains in student achievement were realized (Saunders et al., 2009). This finding is relevant to two of the research questions in this dissertation which address: (a) the relationship between teachers' perceptions of administrative support for PLCs and the resulting impact on student achievement and (b) the interaction effects

between teachers' perceptions of administrative support for PLCs and the quality of collaboration on discrete teacher teams (primary PLCs).

Finally, social capital was identified as an important contributor to organizational performance. Leana and Pil (2006) demonstrated that social capital had a direct and positive influence on student performance in reading, and that social capital influenced positively math achievement through the mediating variable of instructional quality. The integration of social capital theory and the communities of practice construct serves as the conceptual framework on which this study is grounded, and through this theoretical lens, the network of relationships found within schools has the potential to influence changes in teacher behavior that will ultimately improve student learning. Table 2-5 summarizes the major themes addressed in each of the empirical studies that were reviewed.

Table 2-5: Summary of review of the literature

Author	Year	Research Question/s, Hypothesis, or Area of Focus	Primary Methodology	Sample Size	Key Findings
Vescio et al.	2008	Impact of PLCs on Teacher Practice and Student Learning	Literature Review	55 articles, including 11 empirical studies	All 11 empirical studies reported that PLCs lead to changes in teacher practice; eight studies reported increases in student achievement.
Supovitz	2002	1 – Did teaming influence the culture within which teams operate? 2- Did teaming change teachers' instructional practices? 3 – Did teaming improve student learning, as measured by standardized test performance?	Mixed-Methodology: Surveys, interviews, site-visits Hierarchical Linear Modeling (HLM)	79 schools, over 3,000 teachers	1. Teams require targeted PD emphasizing instruction and curriculum; merely grouping teachers is unlikely to result in team interactions that impact instruction and learning. 2. Students on teams with higher use of group instructional practices out-performed students on teams with lower levels of group instructional practice.
Strahan	2003	1. How have teachers and administrators articulated collaborative agendas for reform? 2. How have they strengthened their professional learning communities? 3. How have these professional learning communities nurtured instructional improvement and continuous school renewal?	Qualitative: Focus group interviews, individual interviews, and observations	Three schools: 51 participants (administrators, teachers, support staff, and parents) in focus group interviews; 12 teachers in individual interviews and observations	Three factors most likely contributed to enhanced student achievement: 1. The ability of teachers and administrators to rally around a reform agenda that specifically addressed students' needs. 2. The establishment of supportive relationships with students. 3. Grade-level team meetings that identified needs, shared ideas, developed strategies for improvement, and created direct links between professional development and daily classroom practice.

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Table 2-5, Cont.

Author	Year	Research Question/s, Hypothesis, or Area of Focus	Primary Methodology	Sample Size	Key Findings
Saunders, Goldenberg & Gallimore	2009	Hypothesis: Significant gains in student achievement might result if grade-level teams simply focused less during meetings on non-instructional issues and more on their students' academic struggles.	Quasi-experimental, mixed-methods: ANOVA; Observations, Interviews, and Focus Groups	15 schools serving over 14,000 students: sub-divided into nine treatment schools and six comparison schools	1. Significant student achievement gains were realized in elementary schools when grade-level teams met on a regular basis, when these teams received school-wide instructional leadership, and when these teams used explicit protocols that called for identifying students' needs and developing strategies to meet those needs. 2. A "train the principal" model was not effective; however, the expanded training model - which included institutes, explicit protocols for grade-level teams, and site-based support for principals, content-area coaches, and classroom teachers – contributed to gains in student achievement.

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Table 2-5, Cont.

Author	Year	Research Question/s, Hypothesis, or Area of Focus	Primary Methodology	Sample Size	Key Findings
Goddard, Goddard & Tschannen-Moran	2007	Hypothesis: Teacher collaboration is positively and significantly related to differences among schools in fourth-grade achievement on state-mandated assessments of mathematics and reading achievement.	Quantitative: Hierarchical Linear Modeling (HLM)	47 elementary schools with 452 teachers and 2,536 fourth-grade students	Fourth-grade students have higher achievement in mathematics and reading when they attend schools characterized by higher levels of teacher collaboration for school improvement.
Wood	2007	Program Evaluation of a learning communities initiative based on the following theory of action: Student learning would improve if educators worked together to ensure quality instruction and student work carefully aligned with high standards.	Mixed-methodology: on-site visits, focus groups, observations; analysis of survey data	Five schools (three elementary, one middle, one high) from a district serving approximately 11,400 students; 251 survey respondents	1. Participants found learning communities to be more effective than other types of professional development. 2. Most participants did not claim a connection between their collaborative work and the impact on classroom practice and student learning, indicating that it was "too early" in the project to make this determination.

Continued, next page.

Table 2-5, Cont.

Author	Year	Research Question/s, Hypothesis, or Area of Focus	Primary Methodology	Sample Size	Key Findings
Leana & Pil	2006	(H1): Higher levels of internal social capital within a school will be associated with higher levels of school performance. (H2): Higher levels of external social capital for the school will be associated with higher levels of school performance. (H3): The quality of instruction in the school will mediate the relationship between internal social capital and student achievement. (H4): The quality of instruction in the school will mediate the relationship between external social capital and student achievement.	Mixed-methodology: Semi-structured interviews, on-site observations, focus groups; quantitative analysis of survey data and student achievement data	District of 95 schools with approximately 5,200 employees serving approximately 38,000 students; 88 schools provided complete data	Internal and external social capital are significantly correlated with student achievement test scores in mathematics and in reading.

CHAPTER 3

METHODOLOGY AND RESEARCH DESIGN

Introduction

The purpose of this study is to examine the impact of a three-year Professional Learning Community (PLC) staff development initiative on teachers' classroom practice and student achievement outcomes in one Connecticut school district. Chapter 3 is divided into three main sections. The chapter opens with a statement of the problem which served as the rationale for conducting the study and formulating the research questions: the research questions are presented as well. Next, a description of the district's PLC staff development initiative is presented and an operational definition for PLCs is provided. The chapter concludes with the research methodology and the procedures used to conduct the study. The final section contains descriptions of the following: the research setting; the research design and hypotheses; sample and data collection; student achievement data used in the study; data analysis procedures; variables examined in the study; instrumentation (including information on validity and reliability); limitations and delimitations of the study; and the significance of the study.

Statement of Problem

The federal government's passage of the No Child Left Behind Act (NCLB) in 2002 has placed a significantly increased emphasis on the importance of student achievement outcomes as measured by large-scale, state-mandated assessments. The current era of accountability finds school leaders and education policymakers embracing the notion that teachers can no longer afford to work in isolation if they hope to improve the academic performance of their students. This trend is evident in the current literature

on teacher professional development (DuFour et al., 2008; DuFour et al., 2005; DuFour & Eaker, 1998; Hord, 2004; Newmann & Associates, 1996; Pounder, 1998; Schmoker, 2004), where professional learning communities are championed as a reform approach which promises to deliver meaningful results in terms of changing teachers' classroom practices and improving student learning outcomes. However, despite the significant body of literature regarding the importance of teacher collaboration as a means to improve student outcomes and the intuitive logic of the PLC approach, scholars have identified a paucity of empirical research that links collaborative processes to changes in teacher practice and improved student learning (Gallimore et al., 2009; Goddard et al., 2007; InPraxis Group, Inc., 2006; Pounder, 1998; Saunders et al., 2009; Vescio et al., 2008). Hence, the relatively small number of empirical studies which have been conducted regarding the effectiveness of PLCs (in terms of making positive impacts on teacher practice and student achievement) serves as the primary rationale for this study.

Research Questions

The following four research questions were addressed in this descriptive study:

1. To what extent is there a relationship between the quality of teacher collaboration on discrete teacher teams (primary PLCs) and student achievement outcomes?
2. To what extent is there a relationship between teachers' perceptions of administrative support for discrete teacher teams (primary PLCs) and student achievement outcomes?
3. Do significant interaction effects between these two factors (quality of teacher collaboration and administrative support) exist?
4. To what extent does the quality of teacher collaboration in PLCs influence changes in teachers' instructional practice?

Description of the District's PLC Staff Development Initiative

In August 2006, the superintendent of the district under study was invited by the Connecticut Center for School Change (the Center) to participate in the Center's Systemic Instructional Improvement Program (SIIP). According to information on the Center's website, the SIIP initiative supports ten Connecticut school districts and "provides technical assistance and coaching to senior-level district staff to help districts restructure their operations and focus on improved student achievement" (Connecticut Center for School Change, n.d.). The Center provided the district with a multi-year grant, which has been used to fund a Center-assigned coach and a university-based consultant. Both external professionals have continued to provide staff (district-level administrators, principals and assistant principals, and teachers) with staff development workshops, on-site coaching and facilitation of both district and building-based meetings, and specific protocols for engaging in the district's PLC staff development initiative as a means for improving professional practice and student learning.

It was the belief of the superintendent that creating and supporting professional learning communities in each of the district's schools was essential for strengthening professional practice for administrators and teachers, transforming teachers' instructional practices, and improving student learning. Despite the fact that the district serves an affluent community that continues to enjoy high levels of student achievement, the superintendent was not satisfied with the status quo, and pursued the comprehensive PLC initiative in accordance with her firm belief in continuous improvement. The superintendent was also concerned with what she described as a pervasive sense of complacency regarding established teaching practices and an entrenched sense of

resistance to change among certain staff members. In order to move the district forward, the superintendent worked with other central office leaders and building principals to develop the following theory of action, designed to support the overall PLC initiative and embed a collaboration-based and instructionally focused philosophy about teaching and learning into the district's culture:

> It is the belief of the school district that high quality teacher collaboration brings about improvements in instructional practice and increases in student learning that cannot be achieved by individual teachers working independently of one another. (Teacher Collaboration Survey, 2010, see Appendix B).

Addressing Structural Considerations

School year 2006-07 was a planning year, and it was during this time period that the district's theory of action was created and discussions began regarding the structural components that would be required for supporting the PLC initiative. Central office administrators recognized that teacher teams required regular meeting time embedded into the normal school day schedule. Beginning in school year 2007-08, grade-level common planning time at the elementary school was created, with the expectation that grade-level teams meet twice per week. Central office administrators and elementary principals had discussed creating common planning time for grade-level teams for a number of years, and the PLC initiative provided the impetus to take action in this area. In order to accomplish this, the district had to hire additional staff in *specials* areas such as music, art, and physical education. The additional staff enabled all students in a particular grade to attend specials at the same time, freeing up grade-level teachers during the common planning period. Over the course of the next two years, the district addressed the secondary level, where the number of team-based meetings at the middle school was increased from six times per year to two times per month, and the high school schedule

was changed (despite resistance from some parents who were concerned about issues related to supervision, work schedules, etc.) to incorporate a weekly "late arrival" day for students which enabled high school teams to meet during that time. In addition to creating time for teams to meet, the district revised its teacher evaluation standards to include specific expectations that teachers *collaborate regularly with their colleagues* and *analyze student assessment data* in order to improve teaching and learning. Principals, other administrators, and teachers serving on a district-wide committee worked together to develop these new standards, which extended beyond the scope of traditional teacher evaluation criteria, for example, lesson planning, classroom management, and content knowledge. Finally, a concerted effort was made to fill teaching vacancies with candidates that demonstrated a high level of interest in working in professional learning communities. In addition to administrators, teachers serving on grade-level teams or subject-area departments were actively involved in the interviewing process, and candidates for employment were questioned about their experiences in terms of collaborating with colleagues. This process helped identify candidates who were more likely to collaborate effectively with their colleagues, it provided teachers already serving on teams with an opportunity to assist in the selection of prospective members, and it began the enculturation process for new teachers during their initial experiences with district personnel.

The Implementation of PLCs: Critical Understandings

When the university-based consultant was hired in the spring of 2007, she was enlisted to prepare principals to lead PLC work in their buildings. As was noted in Chapter 2, effective *teacher collaboration* – focused on improving student outcomes – is

a crucial component of the PLC approach to district improvement (DuFour et al., 2008; Gajda & Koliba, 2008; Hord, 2004; InPraxis, 2006; Morrissey, 2000; Newmann & Associates, 1996, Pounder, 1998; Schmoker, 2004). With improved teacher collaboration serving as the major goal of the district's PLC initiative, the university-based consultant introduced the Teacher Collaboration Improvement Framework (TCIF). Figure 3-1 provides a graphic representation of the TCIF, which essentially served as a blueprint for the implementation of PLCs in the district.

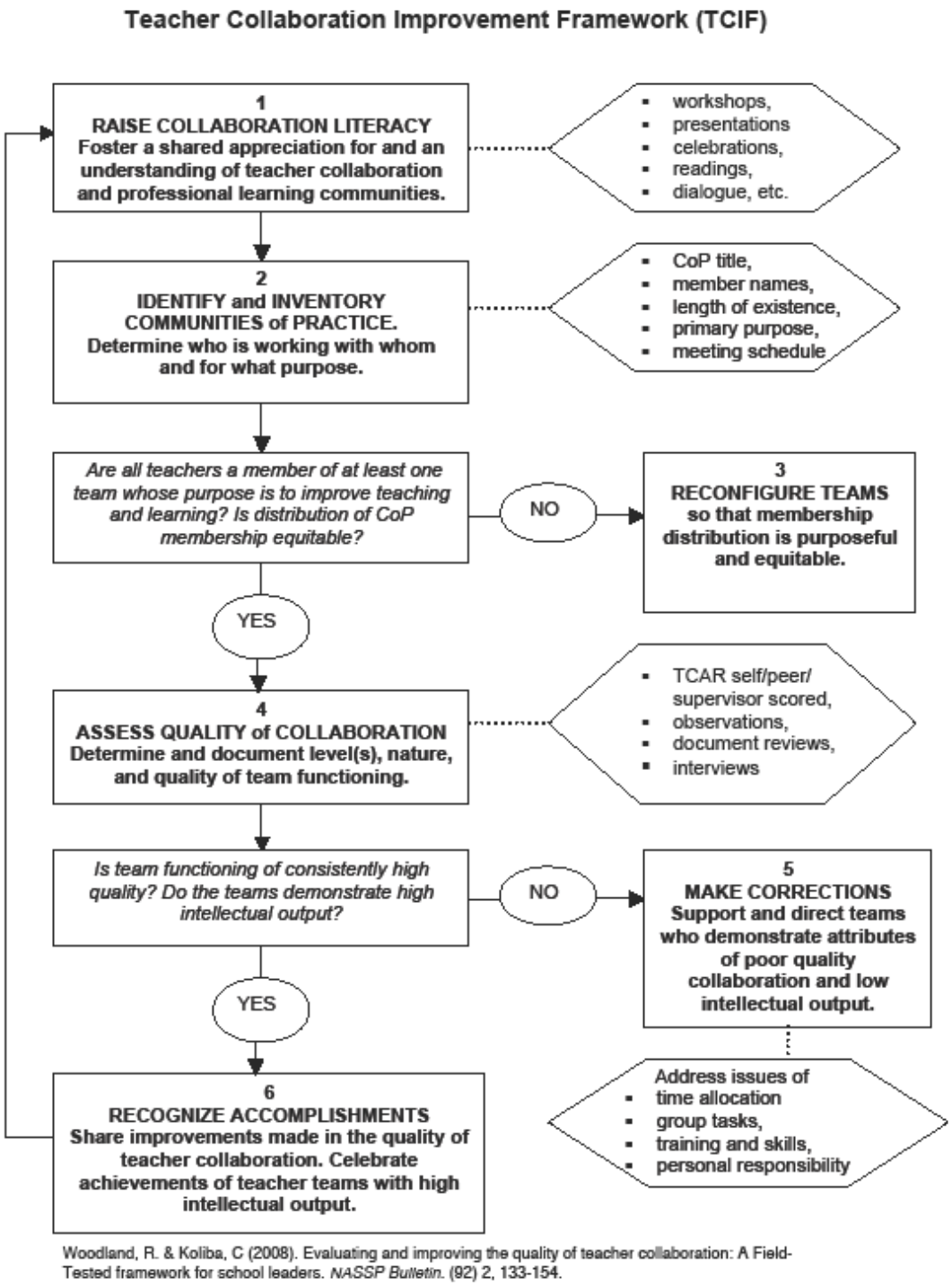

Figure 3-1. Teacher collaboration improvement framework (TCIF).

As Figure 3-1 indicates, Step 1 of the TCIF calls for *raising collaboration literacy*. To that end, the major goal of the initial administrative workshops conducted by

the consultant was to create literacy, or know-how, in the area of professional collaboration. All administrators in the district were asked to read *On Common Ground: The Power of Professional Learning Communities* (DuFour et al., 2005) and engage in a series of facilitated discussions about themes highlighted in the book. Step 2 of the TCIF calls for the *identification and inventory of communities of practice*. Hence, during the first year of the PLC initiative, the consultant conducted a communities of practice (CoP) mapping process, or inventory, in order to provide administrators with information about the number of professional groups (e.g., grade-level teams, curricular teams, special committees) existing within each school. The CoP mapping process was created by Gajda and Koliba (2007), who indicated that its intent is to "establish systematically who is working with whom, the number and type of existing CoPs, and a concrete picture of the CoP constellation that exists within the stakeholder organization" (p. 36).

Once the mapping process was completed, district-level administrators and principals worked to establish an agreed-upon understanding that the major focus of the PLC initiative would be to support those communities of practice which met the criteria for what came to be labeled *primary PLCs*. In other words, certain school-based groups (e.g., the high school crisis team and the middle school cheer fund committee) were eliminated from consideration as primary PLCs because they did not meet the criteria. In general terms, primary PLCs in the district under study were defined as grade-level teams at the elementary level (e.g., 4th-grade team at a particular school) and subject-specific teams at the secondary level (e.g., 7th-grade English team at the middle school). In addition, a limited number of teachers within some schools were reassigned to new teams by building principals in order to foster greater cohesion among the various primary

PLCs and create appropriately balanced grade-level teams (e.g., matching novice teachers with more experienced veterans, considering individuals' personalities in order to improve team chemistry, weighing factors such as teachers' instructional strengths or areas of interest, etc.). The district's efforts in this area were consistent with Step 3 of the TCIF, which recommends that teams be *reconfigured*, if necessary, *so that membership is purposeful and equitable*. However, in the majority of cases, existing team memberships were kept intact; principals deemed most teams to be in a good position to undertake the work of functioning as a primary PLC without making adjustments to the existing team assignments.

After the primary PLCs within each school were identified and the membership of each team was determined, the consultant introduced the *Teacher Collaboration Assessment Rubric*, or TCAR (Gajda & Koliba, 2008). The TCAR (see Appendix A) is a formative assessment tool used to assess the quality of teachers' collaboration within PLCs, measuring the level of team functioning on four elements – dialogue, decision making, action, and evaluation (DDAE) – to which the Gajda and Koliba refer as the "cycle of inquiry" (p. 139). According to Goodlad, Mantle-Bromley, & Goodlad (2004), the DDAE process is arguably one of the single most important vehicles for improving schools (p. 110). *Dialogue* describes the extent to which the team engages in interpersonal communication about leadership or teaching practices and the improvement of those practices. *Decision making* refers to the extent to which the team assesses the effectiveness or value of its practices and then decides upon appropriate next steps. *Action* describes the extent to which the team actually follows through with decisions once they are made, for decision making, by itself, is meaningless unless it is followed by

action. *Evaluation* refers to the extent to which the team engages in the evaluation of its practices through the systematic collection and examination of performance data. In other words, are the decisions that were made and the actions that were taken resulting in improved student outcomes? Each of the four elements in the TCAR's cycle of inquiry is divided into three categories, or descriptors, which allow raters to determine the degree to which the team is functioning on the particular element being rated. The rubric is based upon a six-point, ordinal scale. A review of the scale will indicate that the professional learning community is the strongest, or most highly functioning, form of collaboration (Gajda & Koliba, 2008).

The TCAR is a key component of the district's overall PLC staff development initiative because it has allowed staff to assess the quality of collaboration within PLCs and to measure the degree of adherence to the DDAE process. The introduction of the TCAR as an assessment tool was consistent with Step 4 of the TCIF (*assess quality of collaboration)*. Moreover, the TCAR has provided a useful framework for structuring the regular team meetings within each school. As Saunders et al. (2009) noted, "time for collaboration by itself, even when administratively supported, is unlikely to improve achievement unless additional conditions are in place that structure its use" (p. 1028). The TCAR serves as a helpful tool which situates team meetings in the DDAE process (i.e., in the core of work of improving student learning) by guiding teachers toward collaborative discussions in areas such as the analysis of student work, the analysis of formative and summative assessment data, and the sharing of instructional strategies. Both the Center-assigned coach and the university-based consultant have played a critical role in this process, and they continue to assist staff throughout the district as the PLC

initiative evolves over time. Additionally, it is important to note that while Step 5 (*make corrections*) and Step 6 (*recognize accomplishments*) of the TCIF were not addressed initially, principals and other administrators did begin to work in both of these areas once the overall PLC initiative was underway. Finally, the TCAR serves as an instrument that serves to promote both *team building* and improved *instructional practice.* The critical importance of this bifurcated focus was established in Chapter 2 (Supovitz, 2002; Wood, 2007).

Another key contribution to the district's overall PLC initiative was the creation of the *Teacher Collaboration Survey* (see Appendix B), administered on an annual basis since 2008. District-level administrators and principals have used data collected through the survey to inform their professional practice, to identify specific areas of need with respect to the overall PLC initiative, and to engage in the process of program evaluation. Using survey data in this manner is consistent with Steps 5 and 6 of the TCIF (see Figure 3-1). In addition, data from the 2010 administration of the *Teacher Collaboration Survey* were analyzed in order to investigate the four research questions proposed for this dissertation. The *Teacher Collaboration Survey* will be described in specific detail later in this chapter.

Operational Definition: Primary Professional Learning Community

In Chapter 2, a comprehensive literature review was presented. The review of the literature included an overview of the core characteristics associated with professional learning communities from the perspective of a number of contemporary scholars (DuFour et al., 2008; Hord, 2004; InPraxis Group, Inc., 2006; Newmann & Associates, 1996). Two general themes regarding PLCs emerged from the work of these scholars:

1. Effective PLCs are built upon a collaborative culture designed to examine shared problems of practice.
2. Effective PLCs require an explicit commitment to ensuring high levels of student learning.

In addition, the construct of collaboration was addressed and four key phrases were extracted from the literature: *teachers working together, reflective dialogue that improves practice, common goals* or a *shared vision*, and a focus on *student learning*. Examining the collective impact of these phrases helped to develop a deeper, more meaningful understanding of collaboration as it pertains to the core work of professional learning communities. Collaboration has been incorporated into the operational definition for primary PLCs that was developed for this study; to that end, it was important to acquire a more precise understanding of the construct.

Gajda and Koliba (2007) clarified the difference between two commonly used phrases: communities of practice and professional learning communities. These authors described communities of practice as "the embodiment of interpersonal collaboration within an organization in which the individual members of a social learning system share common practices and work together to achieve mutually desired outcomes" (pp. 26-27). Gajda and Koliba also labeled all intra-organizational groups that have formed for a purpose as communities of practice, and they reserved specifically the term professional learning community for "the highest functioning form of such collaboration" (p. 35). Finally, Saunders et al. (2009) examined the impact of grade-level teams on student achievement and defined learning teams as "grade-level teams in elementary schools that meet two or three times a month" (p. 1010). For the purposes of the empirical research proposed for this dissertation, the following operational definition for primary PLCs was created:

> A team of teachers working together with a common set of students who meet on a regularly scheduled basis in order to (a) *collaborate* on shared problems of practice, and (b) improve student achievement outcomes.

Research Methodology and Procedures

Research Setting

The research was conducted in a suburban school district in Connecticut. The district consists of seven schools (five elementary, one middle, and one high) and serves approximately 4,800 students. The district is located in an affluent community, with only 5% of the student population eligible for free or reduced-price lunch. The student population is overwhelmingly White (88%) and approximately 12% of the overall student population receives special education services. The district employs approximately 400 certified teachers.

Design and Hypotheses

A quantitative, ex-post facto, correlational research design was used for this study. Gall et al. (2007) defined quantitative research as follows:

> Inquiry that is grounded in the assumption that features of the social environment constitute an objective reality that is relatively constant across time and settings. The dominant methodology is to describe and explain features of this reality by collecting numerical data on observable behaviors of samples and by subjecting these data to statistical analysis. (p. 650)

An ex-post facto approach is appropriate when the independent variable cannot be manipulated and the researcher needs to look for natural, preexisting variations in the independent variable (pp. 307-308). This study was designed to explore four main questions. First, the study sought to determine if a relationship existed between the quality of teacher collaboration and student achievement outcomes; hence, the study assumed that higher levels of teacher collaboration would result in higher levels of

student achievement. Second, the study sought to determine if a relationship existed between administrative support for PLCs and student achievement outcomes; hence, the study assumed that higher levels of administrative support for PLCs would result in higher levels of student achievement. Third, the study determined what interactions, if any, existed between the main effects (independent variables) of teacher collaboration and administrative support for PLCs in terms of the impact on student achievement; hence, the study assumed that the two main independent variables (teacher collaboration and administrative support for PLCs) would have a positive interaction effect on student achievement. Fourth, the study explored the relationship between the quality of collaboration in professional learning communities and changes in teachers' instructional practices. To that end, the study assumed that higher levels of quality teacher collaboration within PLCs would result in greater changes in instructional practice. As a result, the four hypotheses for this correlational research design were as follows:

(H1): Higher quality teacher collaboration will be associated with higher levels of student achievement.
(H2): Higher levels of perceived administrative support for PLCs will be associated with higher levels of student achievement.
(H3): The interaction of the two main effects (teacher collaboration and administrative support) will be positive (in terms of the impact on student achievement) and will be different than the sum of their individual effects.
(H4): Higher quality teacher collaboration in primary PLCs will be associated with greater changes in teachers' instructional practice.

Sample and Data Collection

The district under study is involved in an on-going, comprehensive PLC staff development initiative. One component of the initiative entails the administration of an annual survey (the *Teacher Collaboration Survey)* to the certified staff. Archival data collected through the 2010 administration of the *Teacher Collaboration Survey* was

analyzed. The instrument will be described later. Approximately 400 teachers are employed in the district, and the survey was sent to every teacher in May 2010. The response rate was 81.25%, with 325 respondents completing the survey in its entirety. Data were collected from teachers using the web survey tool *Survey Monkey.* Data were then exported to *Microsoft Excel* which allowed for them to be categorized and sorted. In addition to the teacher survey data, the school district provided archival data relative to student performance on annual, state-mandated assessments. The *Statistical Package for the Social Sciences* (SPSS) was used in order to run the statistical analyses for the study.

For the first three research questions examined in the study, the teacher sample was 78. Each of the first three research questions was concerned with teacher teams serving discrete groups of students; hence, the teacher sample was restricted to those serving on teacher teams at the elementary and middle school levels. A total of 23 teams were included in the analyses, ranging in size from two to seven members. All high school teachers were excluded from the data analysis procedures for research questions one through three because it was impossible to link student performance to teacher teams at the high school level. (At the high school, students' class assignments are dispersed across the faculty, unlike in an elementary school where all fourth-grade students are assigned to the fourth-grade team.) In addition, other teachers at the elementary and middle levels (e.g., music, art, physical education, etc.) were excluded because they were not assigned to teacher teams serving specific groups of students. The fourth research question, which examined the relationship between the quality of teachers' collaboration and reported changes in instructional practice, used data from the full sample of 325 teachers.

Students from six schools (five elementary and one middle) were included in the analyses conducted for the first three research questions. Demographic data for each school provided are in Table 3-1.

Table 3-1: Demographic data for schools included in the analyses.

School	Percentage White	Percentage Minority	Percentage Free or Reduced-Price Lunch	Percentage ELL	Percentage Special Education
Elementary School 1	84.7	15.3	5.4	1.7	16.3
Elementary School 2	87.6	12.4	5.4	1.9	10.9
Elementary School 3	88.2	11.8	4.0	0.6	15.0
Elementary School 4	79.0	21.0	11.7	3.9	12.1
Elementary School 5	90.6	9.4	3.2	1.5	13.9
Middle School	89.3	10.7	5.0	0.6	11.8

(Connecticut State Department of Education, n.d.)

Tables 3-2 and 3-3 provide the number of students from each school (disaggregated by grade level and sub-test) whose standardized test scores were included in the analyses. Overall, the standardized testing sample consisted of scores from approximately 2,270 students.

Table 3-2: Number of students by elementary school (and grade level) for each sub-test.

Number of students assessed at each Elementary School by Grade Level and Sub-Test	Elem. 1 N	Elem. 2 N	Elem. 3 N	Elem. 4 N	Elem. 5 N
Grade 3 Math	59	72	108	45	64
Grade 3 Reading	58	72	108	45	64
Grade 3 Writing	59	73	113	46	64
Grade 4 Math	58	70	126	27	68
Grade 4 Reading	56	70	119	27	67
Grade 4 Writing	59	70	132	28	71
Grade 5 Math	48	99	120	47	60
Grade 5 Reading	46	98	120	47	58
Grade 5 Writing	48	99	127	48	62
Grade 5 Science	48	99	128	48	62
Grade 6 Math	55	96	122	47	70
Grade 6 Reading	55	96	119	46	69
Grade 6 Writing	58	96	124	48	72

Table 3-3: Number of students at the middle school (by grade level) for each sub-test.

Number of Students Assessed at the Middle School	Grade 7	Grade 8
Math	380	416
Reading	377	417
Writing	387	426
Science	NA	426

Student Achievement Data Used in the Study

The first three research questions were concerned with school-level effects (the quality of teachers' collaboration and teachers' perceptions regarding administrative supports for PLCs) on student achievement. Data from the annual state assessments, the Connecticut Mastery Tests (CMT), were available at both the state- and district-level in

the form of scaled scores. The CMT is a standardized, criterion-referenced assessment with sub-tests in math, reading, and writing for grades three through eight, and science in grades five and eight only. Castle, Arends, and Rockwood (2008) reported that the CMT "has been shown to possess strong reliability and validity" (p. 4). Mean scaled scores were available for the state as a whole, for each individual school in the district, and by grade-level and sub-test, for example, fourth-grade math. For each grade level and sub-test (math, reading, and writing) the mean scaled score for each school, minus the state average, was divided by the state standard deviation to calculate a *z* score. Moreover, *z* scores were calculated for science results in grades five and eight (the only grades at which this assessment is given). The same *z*-score approach was used by Saunders et al. (2009) when they examined the impact of school-based learning teams on student achievement in urban elementary schools in Southern California. According to Boslaugh and Watters (2008), a *z* score "transforms a raw score into units of standard deviation above or below the mean. This translates the scores so that they may be evaluated in reference to the standard normal distribution" (p. 369). For the analysis linking student achievement to school-level effects on primary PLCs, a total of 72 *z* scores were calculated. In order to calculate the *z* scores, the standard deviations were requested from the Connecticut State Department of Education. The information provided by the department is displayed in Figure 3-2:

Grade	Mathematics		Reading		Writing		Science	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
3	258.30	51.98	240.11	42.37	250.67	47.78		
4	266.86	49.82	252.87	43.14	252.36	42.97		
5	272.92	49.44	243.11	44.16	256.79	44.59	256.96	47.49
6	266.89	44.83	265.39	43.86	256.14	45.89		
7	269.13	45.57	256.01	47.53	247.71	43.85		
8	264.08	43.74	259.61	44.69	250.25	45.20	254.00	44.17

Figure 3-2. State mean scores and standard deviations, by grade level and sub-test, 2010 (Connecticut State Department of Education).

In addition, the range of the *z* scores, by sub-test, for the district under study is displayed in Table 3-4. Table 3-4 also includes the scaled scores, in parentheses, from which the *z* scores were calculated:

Table 3-4: Range of standardized performance on CMT sub-tests.

Subject Area	Min. *z* score (and scaled score)	Max. *z* score (and scaled score)
Math	.39 (292.60)	.89 (311.40)
Reading	.40 (270.30)	1.00 (309.10)
Writing	.22 (261.20)	1.12 (307.40)
Science	.41 (276.60)	1.07 (308.30)

Data Analysis Procedures

This study examines the relationships between the independent variables and dependent variables in accordance with the research questions that have been identified. In order to examine the relationship between two variables simultaneously, it is necessary to use bivariate methods (Coladarci, Cobb, Minium, & Clarke, 2004). The first type of bivariate methodology that will be used in this study is correlational analysis. A correlation is a statistic used to quantify the association between two variables (Boslaugh

& Watters, 2008). The technical term of the statistical measure of the association between variables is the *Pearson product-moment coefficient of correlation*, commonly expressed as Pearson *r*. Pearson *r* coefficients range from 0 to 1.00 and can be either positive or negative. Positive (direct) correlations indicate that as the value of one variable increases, the value of the other increases as well. Negative (inverse) correlations indicate that as the value of one variable increases, the value of the other decreases. In addition, correlations closer to 1.0 or -1.0 (e.g., .97) indicate a very strong relationship, while those closer to zero (e.g., - 0.02) indicate a very weak relationship. Hence, Pearson *r* reflects the *direction* of the relationship between two variables (either positive or negative) and the *magnitude* (the relative strength) of the relationship between those variables (Boslaugh & Watters; Coladarci, et al., 2004). However, as Coladarci et al. noted, "correlation does not imply causation" (p. 135). In other words, just because a relationship is noted between two variables using correlational analysis, the researcher cannot claim that a causal relationship exists. For the purposes of this study, correlational analysis was used to determine both the direction and the strength of the relationships existing between the variables under examination for research questions one, two, and four.

The second bivariate statistical method chosen for this study was linear regression. According to Boslaugh and Watters (2008), "linear regression is an extremely valuable technique, which is often used for prediction models where no experimental control has been assigned to the collection of data" (p. 224). While linear regression is similar in many respects to correlation analysis, the key difference is that linear regression analysis requires the researcher to identify the independent and dependent

variables. As a result, linear regression enables the researcher to predict the values of the dependent variable, based on the values of the independent variable. Linear regression was used to determine the interaction effects of the two independent variables (collaboration and administrative support) on student achievement in accordance with research question three.

Variables

According to Gall et al. (2007), "in a hypothesized cause-and-effect relationship, the independent variable is the cause" (p. 642). Likewise, they indicated that "the dependent variable is the effect" (p. 637). For the first question addressed in this research study, the independent variable was the quality of collaboration and the dependent variable was student achievement. The independent variable was measured by teacher responses to Likert-scale items on the *Teacher Collaboration Survey* that specifically assess the quality of collaboration. The dependent variable was measured by student test scores on standardized, state-mandated annual assessments. Students' scores were grouped by the primary PLCs in which their teachers work in order to assess the relationship between the independent and dependent variables. As noted earlier, students' mean scaled scores (grouped by primary PLC) were converted into *z* scores which allowed for the comparison of performance across grade levels on assessments measuring the same the subject area, e.g., mathematics.

For research question two, the independent variable was the perceived level of administrator support for primary PLCs and the dependent variable was student achievement. The independent variable was measured by teachers' responses to Likert-scale items on the *Teacher Collaboration Survey* that specifically assess perceptions of

administrative support for PLCs. Student achievement was again measured by student test scores on standardized, state-mandated annual assessments that were converted into *z* scores.

The third research question examined the interaction effects between the quality of teacher collaboration and teachers' perceptions of administrative support for primary PLCs. Collaboration and administrative support for primary PLCs served as independent variables, while student achievement scores (converted into *z* scores) served as the dependent variable.

For the fourth research question, the independent variable was the quality of teachers' collaboration and the dependent variable was teachers' instructional practice. Both variables examined with respect to research question four were measured by responses to specific, Likert-scale items on the *Teacher Collaboration Survey*. These items will be described in the next section: Instrumentation.

Instrumentation

The instrument used in the study was the *Teacher Collaboration Survey* (see Appendix B). The survey was developed in partnership between the school district under study; a consulting professor from a large (extensive doctoral, research 1) university who has conducted ample research in the area of professional learning communities; another professor from the same university who specializes in educational testing and measurement; and the Connecticut Center for School Change, which sponsors the Systemic Instructional Improvement Program (SIIP) and has been providing technical assistance and coaching to the district's senior-level staff since 2006. According to Gall et al. (2007), "a survey is a method of data collection using questionnaires or interviews

to collect data from a sample that has been selected to represent a population to which the findings of the data analysis can be generalized" (p. 230). *The Teacher Collaboration Survey* was designed to assess three major areas, or domains, of teacher collaboration:

1. The quality of collaboration within discrete teacher teams.
2. Teachers' perceptions regarding administrative support for PLCs.
3. The impact of PLCs on teachers' instructional practice. For the purposes of this study, responses from all three major areas were examined.

The majority of the survey items on *The Teacher Collaboration Survey* were designed to solicit responses on a five-point Likert scale; however, some of the items required forced choices and open-ended responses. It is important to note that the survey also required teachers to identify the primary PLC on which they serve, for example, 4th-grade team at a particular elementary school. The identification process allowed for teachers to be grouped into their primary PLCs (teacher teams) for the purposes of the various statistical analyses. In addition to questions requesting demographic information, the 2010 iteration of the *Teacher Collaboration Survey* contained 42 items that required forced choice or Likert scale responses and 11 open-ended items that required qualitative-type responses. Not all of the items included on the survey were analyzed for the purposes of this study. Below, the specific areas of the survey that were used are described in greater detail.

Quality of collaboration within your primary PLC. Section 5 (see Appendix B) of the 2010 *Teacher Collaboration Survey* was designed to assess the quality of teachers' collaboration within their primary PLCs. The quality of teachers' collaboration served as the independent variable in this study for research questions one (To what extent is there a relationship between the quality of teacher collaboration on discrete teacher teams and student achievement outcomes?) and four (To what extent does the quality of teacher collaboration in PLCs influence changes in teachers' instructional

practice?). This domain contained 22 items that were measured on a five-point Likert scale, with response options ranging from “Strongly Disagree” to “Strongly Agree.” Another optional choice was “Don’t Know/Cannot Determine,” and individual responses in this category were excluded from the analyses. Individual item responses were computed into an overall mean score for each teacher, with higher average scores indicating more positive perceptions about the quality of collaboration.

The independent variable (the quality of teachers’ professional collaboration) was calculated in two distinct ways. First, each teacher’s overall mean score was considered separately from the scores of his or her colleagues within the primary PLC so that the relationship between the independent variable and the dependent variable (student achievement) could be assessed without grouping teachers into their primary PLCs. Second, a team mean score was calculated for each primary PLC. This allowed for the examination of the overall distribution of mean scores on the independent variable. In addition, the calculation of the team means enabled analyses to be conducted where each teacher’s individual mean score contributed to his or her primary PLC’s overall perception of the quality of team-based collaboration.

The 22 items assessing the domain of teacher collaboration on the 2010 *Teacher Collaboration Survey* are presented in Table 3-5.

Table 3-5: *Teacher Collaboration Survey*—Characteristics of teacher collaboration.

a)	All the members of my primary PLC share and express a vision for student learning.
b)	The goal of our collaboration is clear – to systematically improve instruction and increase student learning.
c)	The membership configuration of my primary PLC is appropriate – the right people are members of the group.
d)	Our meetings are consistently attended by ALL members.
e)	We always have a pre-planned agenda for our meetings.
f)	We always keep a record of what happened in our meetings.
g)	Our dialogue is focused on the examination of instructional practice and student performance data.
h)	We utilize specific protocols to structure our dialogue.
i)	We experience healthy professional inter-personal tension and directly address and resolve conflict.
j)	There are no "dominators" or "hibernators" in the group – everyone participates/contributes equally.
k)	We regularly make decisions about what instructional practices to initiate, maintain, develop, or discontinue.
l)	All of our decisions are informed by group dialogue.
m)	Decisions are transparent – everyone knows what the decision is and how and why it was made.
n)	The decisions we make are clearly and directly related to the improvement of instructional practice and the cultivation of student learning.
o)	As a result of group decision-making each one of us makes pedagogically complex adjustments to our instructional practice.
p)	There is always an equitable distribution of workload among team members.
q)	As a group we regularly collect and analyze information about member teaching practices.
r)	As a group we regularly collect and analyze information about student performance.
s)	We observe the classroom instruction of our colleagues.
t)	We use student performance data to evaluate the merit of our instructional practices.
u)	We regularly and publicly share evaluation data in our primary PLC.
v)	The accomplishments of our primary PLC are publicly recognized.

Perceptions regarding administrative support for PLCs. Section 6 (see Appendix B) of the 2010 *Teacher Collaboration Survey* was designed to assess teachers' perceptions regarding the role of their administrator (e.g., principal, assistant principal, or program director) in terms of providing support for primary PLCs. Data collected in this section were used for measuring the independent variable in research question two (To what extent is there a relationship between teachers' perceptions of administrative support for discrete teacher teams, i.e., primary PLCs, and student achievement outcomes?). Teachers' perceptions of administrative support for primary PLCs were assessed by their responses to twelve items that were measured on a five-point Likert

scale, with response options ranging from “Strongly Disagree” to “Strongly Agree.” Individual item responses for each teacher were computed into an overall mean score for each teacher, with higher scores indicating more favorable perceptions regarding the level of administrative support provided to PLCs. Another optional choice was “Don’t Know/Cannot Determine,” and individual responses in this category were excluded from the analyses. The twelve items in this section of the *Teacher Collaboration Survey* are presented in Table 3-6.

Table 3-6: *Teacher Collaboration Survey*—Role of the administrator/supervisor

a)	My Administration/Supervisor promotes a shared vision for teacher collaboration.
b)	My Administration/Supervisor observes my PLC participation.
c)	My Administration/Supervisor monitors the actions and achievements of my primary PLC.
d)	My Administration/Supervisor monitors how the work of my primary PLC impacts student achievement.
e)	I have received individual feedback from my Administration/Supervisor about how I could improve my contribution to my primary PLC.
f)	Our group has received feedback from the Administration/Supervisor about how to improve the quality of collaboration in our primary PLC.
g)	I understand how to use Teacher Collaboration Assessment Rubric (TCAR) as a tool to improve the quality of collaboration in my primary PLC.
h)	My Administration/Supervisor helps my primary PLC to set clear and measurable goals for student learning.
i)	My Administration/Supervisor helps my primary PLC figure out how to monitor our progress and achievements on a continuous basis.
j)	My Administration/Supervisor celebrates the achievements of my PLC.
k)	My Administration/Supervisor uses evidence to identify areas that need improvement in my primary PLC.
l)	My Administration/Supervisor effectively addresses individuals who are resistant to, or disruptive of, the development of high quality teacher collaboration.

The independent variable (teachers’ perceptions of administrative support for PLCs) was calculated in two distinct ways (an identical process was used to calculate teachers’ quality of collaboration and was described earlier). First, each teacher’s overall mean score was considered separately from the scores of his or her colleagues within the primary PLC so that the relationship between the independent variable and the dependent variable (student achievement) could be assessed without grouping teachers into their primary PLCs. Second, a team mean score was calculated for each primary PLC. This

allowed for the examination of the overall distribution of mean scores on the independent variable. In addition, the calculation of the team means enabled analyses to be conducted where each teacher's individual mean score contributed to his or her primary PLC's overall perception of administrative support.

The impact of PLCs on teachers' instructional practice. The impact of PLCs on teachers' instructional practice was examined in research question four (To what extent does the quality of teacher collaboration in PLCs influence changes in teachers' instructional practice?). For this research question, change in teachers' instructional practices served as the dependent variable. Change in teachers' instructional practices was assessed in section 7 (see Appendix B) of the 2010 *Teacher Collaboration Survey:* Collaboration, Your Instructional Practice, and Student Achievement. While this section contained eight items measured with a five-point, Likert scale, only two of the items were analyzed in accordance with research question four because these items addressed specifically self-reported changes in teachers' instructional practice. Each of these two items provided response options ranging from "Strongly Disagree" to "Strongly Agree." Individual item responses were computed into overall mean scores for each teacher, with higher scores indicating greater changes in instructional practice. Another optional choice was "Don't Know/Cannot Determine," and individual responses in this category were excluded from the analyses. The two items analyzed in accordance with research question four are presented in Table 3-7.

Table 3-7: *Teacher Collaboration Survey*—Effect of your primary PLC.

a)	My instructional practice has substantially improved as a result of participating in my primary PLC.
e)	Working in my primary PLC has a greater positive effect on my instructional practice than working independently.

Validity of the *Teacher Collaboration Survey*. Boslaugh and Watters (2008) indicated that validity "refers to how well a test or rating scale measures what it is supposed to measure" (p. 12). The *Teacher Collaboration Survey* (the data used in the present study were gleaned from its third administration) was designed by a university professor who is a Subject Matter Expert (SME) in professional learning communities. The SME collaborated with the superintendent, the assistant superintendent, and other administrators in the district under study to develop many of the items; furthermore, the SME consulted with another university professor who specializes in the field of educational testing and measurement to review the survey items before the survey was finalized. According to Ramirez (2002):

> The need for subject matter expertise is inherent in survey design….Many kinds of people have been identified as subject matter experts in survey development efforts. A common definition seems to emerge: someone with extraordinary insight into the population and/or subject under study above and beyond what a member of the population under study or participant in the phenomenon being investigated might have. (pp. 1-2)

Likewise, Sireci and Geisinger (1993) reported that "subjective methods for evaluating test content use SMEs to determine whether the items that comprise a test represent the content areas the test purports to measure" (p. 4). With respect to the *Teacher Collaboration Survey,* its primary validation lies in the fact that it was designed by a Subject Matter Expert; hence, one can be reasonably confident that the survey has both acceptable *content validity*, i.e., it measures the important content in the area of interest, and *face validity*, i.e., a typical person would judge it to be a fair assessment of the qualities being examined by the researcher (Boslaugh & Watters, 2008).

Reliability of the *Teacher Collaboration Survey*. Boslaugh and Watters (2008) described reliability as "how consistent or repeatable measurements are" (p. 9).

Furthermore, they indicated that *internal consistency reliability* "refers to how well the items that make up a test reflect the same construct" (p. 10). Gall et al. (2007) indicated that the *Cronbach's* α coefficient is a commonly used measure of internal consistency for a test or survey that contains "items that are not scored dichotomously, based on the extent to which test-takers who answer a given test item one way respond to other items in a similar way" (p. 637). The *Cronbach's* α coefficient was calculated for each of the three major areas assessed on the *Teacher Collaboration Survey.* The inter-item reliability (or internal consistency) statistics, as expressed by *Cronbach's* α, are presented in Table 3-8.

Table 3-8: Inter-item reliability of the *Teacher Collaboration Survey*.

Major Areas of the *Teacher Collaboration Survey*	*Cronbach's α*
The quality of collaboration within discrete teacher teams	.930
Perceptions regarding administrative support for PLCs	.950
The impact of PLCs on teachers' instructional practice	.914

Gliem and Gliem (2003) reported that the *Cronbach's* α reliability coefficient normally ranges from 0 to 1, but that there is no lower limit to the coefficient. Moreover, they suggested that a coefficient of .8 is a reasonable goal for researchers using a scale, and that the higher the coefficient, the stronger the level of internal consistency. Hence, based upon the correlation coefficients reported in Table 3-8, one can be reasonably confident that the three major areas assessed by the *Teacher Collaboration Survey* each

have an acceptable level of internal consistency reliability, that is, the items within each area assess the same construct.

Limitations and Delimitations

This study has four major limitations. First, the district under study serves a small, relatively homogeneous and affluent community. Hence, the generalizability of the results is limited. Second, the district has enjoyed historically high levels of student performance on state-mandated assessments, and this serves as another factor which limited the generalizability of the results. Third, the main independent variables under study within the primary PLCs (teacher collaboration and administrative support for PLCs) were linked to standardized student achievement data at the elementary and middle school levels only; hence, the results for research questions one, two, and three cannot be generalized to high school settings (question four was approached with the full sample of 325, including high school teachers). Fourth, the sample size of the independent variables (measured by responses on the *Teacher Collaboration Survey*) for research questions one, two, and three was small due to the size of the district under study. Twenty (20) primary PLCs were linked to student performance in reading and writing; twenty (20) primary PLCs were linked to student performance in mathematics; and six (6) primary PLCs were linked to student performance in science. The primary delimitation of this study involved using a data set confined to an isolated population of teachers and students in one school district.

Significance of the Study

This research study is unique in that it examined the impact of professional learning communities in an affluent, suburban school district which has historically

enjoyed high levels of student performance. The few studies which have been conducted regarding the impact of PLCs on changes in teachers' instructional practice or student achievement have generally been focused on urban districts or school districts in need of improvement. While this trend is certainly understandable in light of the press to improve student outcomes in such places, it is important to examine efforts to improve instructional practice and student achievement outcomes in districts where there has historically been less urgency to do so. While high performing districts are not under pressure to realize dramatic and immediate gains in student achievement outcomes, they may still benefit from developing a better understanding of how teacher collaboration impacts variables such as staff morale, student motivation, and overall efforts to improve the quality of teaching and learning.

This study was conceptually grounded in social capital theory (Leana & Pil, 2006; Nahapiet & Ghoshal, 1998) and the communities of practice construct (Koliba & Gajda, 2009; Wenger & Snyder, 2000). In short, social capital theory posits that the network of interpersonal relationships existing within an organization is a potentially potent vehicle for improving organizational performance. The communities of practice construct is a "powerful unit of analysis" (Koliba & Gajda, 2009, p. 118). The term refers to a group or team bound by a shared enterprise that *collaborates* to increase collective knowledge and skill and to solve problems that will ultimately lead to improvements in organizational performance (Wenger & Snyder, 2000). Viewed through the lens of a conceptual framework which integrates social capital theory and the communities of practice construct, the study examined the impact of primary professional learning communities on organizational performance in a school district. Specifically, the study focused on

outcome measures in two areas: student performance and changes in teachers' instructional practice. One aim of this study was to apply social capital theory and the communities of practice construct to research on organizational performance in public schools in order to contribute to the scholarly literature and also serve as a foundation for future research in this area.

Finally, this study provided an operational definition for the term primary professional learning communities. Future research in this area might benefit from the application of this operational definition to determine and define the presence of such teacher teams within schools and to examine the impact that such teams have upon the ability to achieve desired organizational goals. As Leana and Pil (2006) indicated, "there are multiple communities, for example, in which teachers can participate, even within a single school" (p. 364). While multiple and overlapping communities of teachers may indeed exist within every school, the operational definition provided for this study restricts the definition to teams which (a) meet on a regular basis and (b) work with a common set of students. Furthermore, the definition requires such teams to collaborate on shared problems of practice with the goal of improving student achievement outcomes. This more restrictive definition may prove to be beneficial to future research in the area of professional learning communities.

CHAPTER 4

RESULTS

Introduction

The purpose of this study is to examine the impact of a three-year Professional Learning Community (PLC) staff development initiative designed to influence teachers' classroom practice and student achievement outcomes in one suburban school district located in Connecticut. Four primary research questions were addressed. No significant findings were present in terms of the relationship between the quality of teachers' collaboration and student achievement outcomes on standardized assessments. However, modest, statistically significant relationships were found between teachers' perceptions of administrative support for primary PLCs and student performance in both reading and writing. In addition, a statistically significant, positive interaction was observed between the quality of collaboration and perceptions of administrative support when a multiple linear regression exercise was performed to determine the combined impact of these independent variables on student achievement in reading and in writing. Finally, statistically significant findings were noted with respect to the relationship between the quality of teachers' collaboration and two dependent variables: changes in teachers' instructional practice and increases in student learning (as measured by participants' responses on the *Teacher Collaboration Survey*). This chapter describes the results of the four research questions that were explored and includes tables which present quantitative data from each of the statistical analyses that were performed. In addition, two figures provide graphic representations of the statistically significant interactions that were found in accordance with research question three.

Results for Research Question One

Table 4-1 shows the correlations among the two measures of the quality of collaboration on PLCs and student achievement. As would be expected, the correlations between the various subject-area, standardized sub-tests are statistically significant. In addition, the correlation between Team Mean Collaboration and Individual Teacher Collaboration Rating is strong and statistically significant. This would also be expected because each of these terms represents a different way of calculating a measure of the same construct: the quality of teachers' professional collaboration. As was noted in Chapter 3, the raw survey data were tabulated in two ways. Team Mean Collaboration was calculated as the primary PLC's mean score, while Individual Teacher Collaboration represents each teacher's individual mean score, enabling an analysis without placing teachers into primary PLCs. As Table 4-1 demonstrates, there is no statistically significant relationship between either of the separate measures of the quality of teachers' collaboration and student achievement outcomes on any of the sub-tests. This finding will be addressed in more detail in Chapter 5.

Table 4-1: Pearson correlation matrix among quality of collaboration ratings and student achievement measures (Connecticut Mastery Test Results).

Subscale	1	2	3	4	5	6
1. Team mean collaboration rating	_	.622**	-.083	.026	-.204	-.332
2. Individual teacher collaboration rating		_	-.052	.016	-.125	-.189
3. Math score			_	.733**	.325*	.895**
4.Reading score				_	.495**	.890**
5. Writing score					_	.863**
6. Science score						_

**$p<0.01$
*$p<0.05$

Results for Research Question Two

Table 4-2 shows the correlations among the two measures of the perceptions of administrative support for PLCs and student achievement. As would be expected, the

correlations between the various subject-area, standardized sub-tests are statistically significant. In addition, the correlation between Team Mean Administrative Support Rating and Individual Perception of Administrative Support is strong and statistically significant. This would also be expected because each of these terms represents a different way of calculating a measure of the same construct: teachers' perceptions of administrative support for primary PLCs. As was noted in Chapter 3, the raw survey data were tabulated in two ways. Team Mean Administrative Support Rating was calculated as the primary PLC's mean score, while Individual Perceptions of Administrative Support represents each teacher's individual mean score, enabling an analysis without placing teachers into primary PLCs.

As Table 4-2 demonstrates, there is a statistically significant relationship (.321, $p<0.01$) between Team Mean Administrative Support Rating and writing achievement. In addition, there is a statistically significant relationships (.311, $p<0.05$) between Team Mean Administrative Support Rating and reading achievement. The remaining correlations do not demonstrate statistically significant relationships. These findings will be discussed in more detail in Chapter 5.

Table 4-2: Pearson correlation matrix among perceptions of administrative support measures and student achievement measures (Connecticut Mastery Test Results).

Subscale	1	2	3	4	5	6
1. Team mean administrative support rating	_	.572**	-.103	.311*	.321**	.035
2. Individual perception of administrative support rating		_	-.066	.185	.192	.017
3. Math score			_	.733**	.325**	.895**
4. Reading score				_	.495**	.890**
5.Writing score					_	.863**
6. Science score						_

**$p<0.01$
*$p<0.05$

Results for Research Question Three

Tables 4-3 through 4-6 demonstrate the results for the regression analyses which examined the interaction of the two main effects, or independent variables (the quality of teachers' collaboration and administrative support for PLCs), on each measure of student achievement. The data were checked and conformed to all four assumptions for linear regression (linearity, normality, homoscedasticity, and independence). For these analyses, the team mean collaboration score (Collaboration) for each primary PLC served as one independent variable, and each primary PLC's mean rating of the perception of administrative support (Admin. Support) served as the other independent variable. The interaction term (Interaction) was calculated as the product of the two independent variables for each respondent. In addition, before the regression analyses were run, the independent variables were mean-centered. Achievement in math was linked to 20 primary PLCs, achievement in reading and in writing was linked to 20 primary PLCs, and

achievement in science was linked to six primary PLCs. (As noted in Chapter 3, the science test is only administered in grades five and eight.)

Tables 4-4 and 4-5 demonstrate the results for the interaction effects of the two predictors (independent variables) on reading and writing achievement. These were the only interactions that were statistically significant, with the predictors having a positive effect on reading and writing. (Earlier, in Table 4-2, the statistically significant relationship between administrative support and achievement in both reading and writing was demonstrated). The adjusted R^2 coefficient (.139) in Table 4-4 (model 2) suggests that 13.9% of the variance in the measure of reading achievement can be predicted by measures of teacher collaboration and administrative support. Likewise, the adjusted R^2 coefficient (.261) in Table 4-5 suggests that 26.1% of the variance in the measure of writing achievement can be predicted by measures of teacher collaboration and administrative support. Graphic representations of the statistically significant interactions are displayed in Figures 4-1 and 4-2. An examination of both Figure 4-1 and Figure 4-2 reveals that a similar pattern is present for each interaction. The figures suggest that when the level of administrative support is high, student performance increases with high collaboration. Likewise, student performance tends to decrease when administrative support is high and there are low levels of collaboration. The regression analyses which addressed the interaction of the two predictors on student achievement in math and in science were not statistically significant. These findings will be addressed in Chapter 5.

Table 4-3: Summary of regression analysis for the interaction of the main effects of quality of collaboration and administrative support for PLCs as a predictor for math achievement (Connecticut Mastery Test Results).

	Adjusted R^2
Model 1	-.022
Model 2	.002

Model	B	SE B	β	t	Sig.	95% CI Lower Bound	95% CI Upper Bound
1 (Constant)	.601	.019		31.844	.000	.563	.639
Admin. Support	-.034	.058	-.083	-.584	.561	-.149	.082
Collaboration	-.022	.061	-.051	-.358	.722	-.143	.100
2 (Constant)	.586	.021		27.820	.000	.544	.628
Admin. Support	-.049	.058	-.120	-.839	.405	-.165	.067
Collaboration	.040	.073	.095	.556	.580	-.105	.186
Interaction	.279	.183	.241	1.528	.132	-.087	.645

Note. N=20. CI = confidence interval.

Table 4-4: Summary of regression analysis for the interaction of the main effects of quality of collaboration and administrative support for PLCs as a predictor for reading achievement (Connecticut Mastery Test Results).

	Adjusted R^2
Model 1	.070
Model 2	.139

Model	B	SE B	β	t	Sig.	95% CI Lower Bound	95% CI Upper Bound
1 (Constant)	.669	.018		37.217	.000	.633	.705
Admin. Support	.156	.060	.322	2.599	.012	.036	.276
Collaboration	-.025	.063	-.049	-.397	.692	-.152	.102
2 (Constant)	.653	.019		35.254	.000	.616	.690
Admin. Support	.068	.068	.141	1.007	.318	-.067	.204
Collaboration	.045	.067	.089	.672	.504	-.090	.180
Interaction	.638	.260	.348	2.452	.017	.118	1.158

Note. N=20. CI = confidence interval.

Table 4-5: Summary of regression analysis for the interaction of the main effects of quality of collaboration and administrative support for PLCs as a predictor for writing achievement (Connecticut Mastery Test Results).

	Adjusted R^2
Model 1	.160
Model 2	.261

Model	B	SE B	β	t	Sig.	95% CI Lower Bound	95% CI Upper Bound
1 (Constant)	.592	.023		25.831	.000	.547	.638
Admin. Support	.253	.077	.391	3.313	.002	.101	.406
Collaboration	-.203	.081	-.296	-2.511	.015	-.365	-.041
2 (Constant)	.567	.023		24.620	.000	.521	.613
Admin. Support	.117	.084	.180	1.381	.172	-.052	.285
Collaboration	-.093	.084	-.135	-1.106	.273	-.261	.075
Interaction	.998	.324	.405	3.083	.003	.351	1.645

Note. N=20. CI = confidence interval.

Table 4-6: Summary of regression analysis for the interaction of the main effects of quality of collaboration and administrative support for PLCs as a predictor for science achievement (Connecticut Mastery Test Results).

	Adjusted R^2
Model 1	.050
Model 2	-.001

Model	B	SE B	β	t	Sig.	95% CI Lower Bound	95% CI Upper Bound
1 (Constant)	.573	.041		14.082	.000	.488	.658
Admin. Support	.112	.138	.186	.812	.427	-.177	.400
Collaboration	-.254	.145	-.402	-.1.753	.096	-.556	.049
2 (Constant)	.572	.042		13.624	.000	.484	.660
Admin. Support	.099	.155	.164	.635	.533	-.277	.424
Collaboration	-.219	.220	-.348	-.997	.332	-.682	.243
Interaction	.187	.892	.068	.210	.836	-1.686	2.060

Note. N=6. CI = confidence interval.

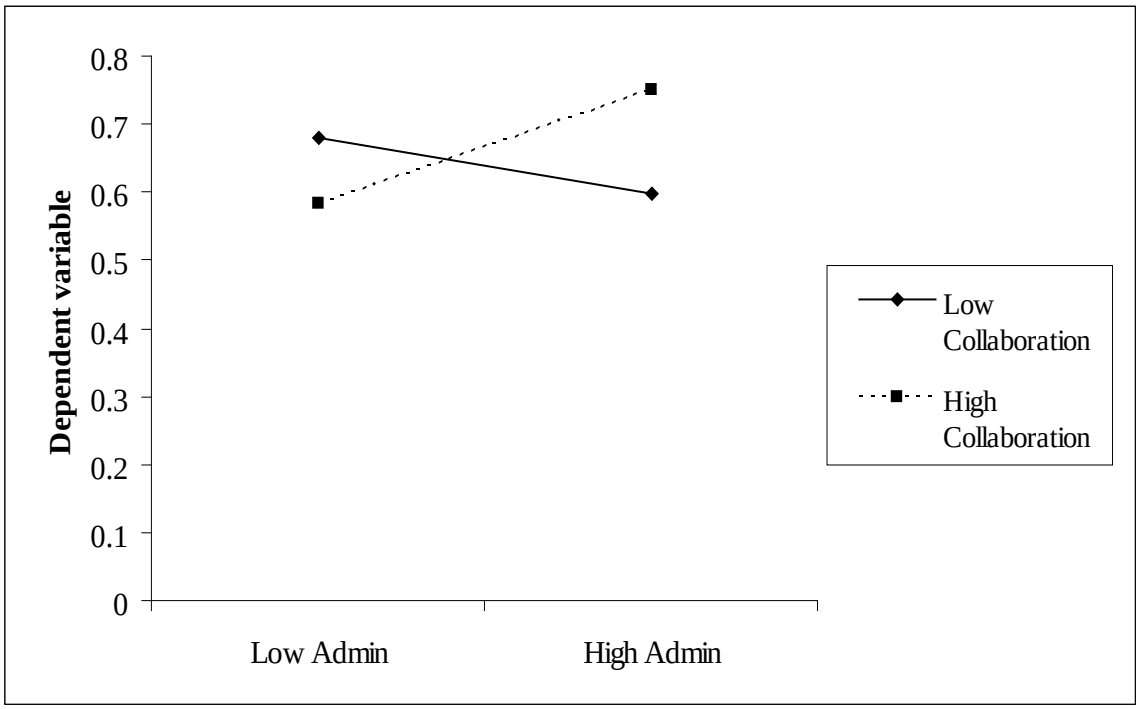

Figure 4-1: Two-way interaction effects for administrative support and teacher collaboration as predictors of reading achievement.

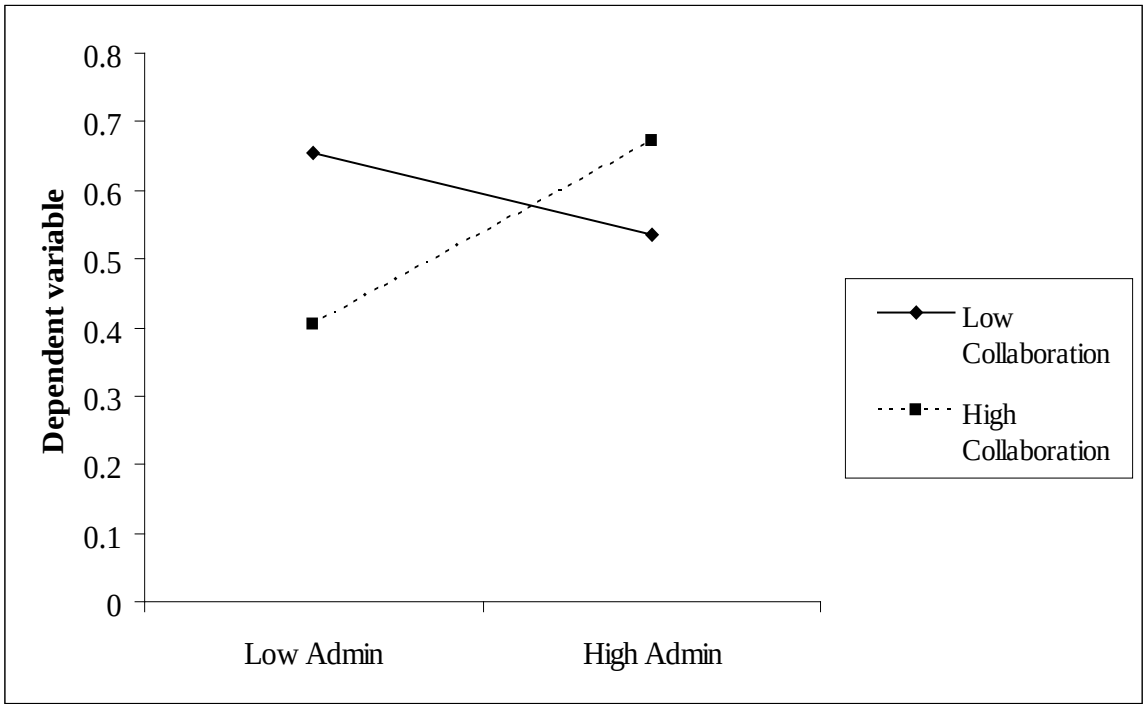

Figure 4-2: Two-way interaction effects for administrative support and teacher collaboration as predictors of writing achievement.

Results for Research Question Four

Table 4-7 demonstrates the correlations among the quality of teachers' collaboration, reported changes in instructional practice, and perceived changes in student learning. Although the fourth research question (To what extent does the quality of collaboration influence changes in instructional practice?) establishes *changes in instructional practice* as the dependent variable, after the survey data were examined, an additional analysis was run to explore the relationship between the quality of teachers' collaboration and *perceived changes in student learning*. This second analysis served as a byproduct of the original research question and is consistent with the overarching premise of this study that changes in instructional practice will lead to improved student learning. For the fourth research question, the entire sample of 325 teachers was included because it was not necessary to link primary PLCs to student achievement results. Mean scores on the quality of collaboration were computed for all 325 respondents; however, a total of ten respondents were excluded because they responded "Don't Know/Cannot Determine" to at least one of the two items that were used to assess changes in instructional practice. In addition, thirteen teachers responded "Don't Know/Cannot Determine" to the item which assessed perceived increases in student learning as a result of PLCs. Hence, for research question four, 315 teachers were included in the first analysis and 312 were included in the second. As Table 4-7 demonstrates, a statistically significant relationship (.513, $p<0.01$) exists between collaboration and changes in instructional practice. In addition, a statistically significant relationship (.480, $p<0.01$) exists between collaboration and increases in student learning. Finally, a rather strong correlation (.711,

$p<0.01$) exists between changes in instructional practice and increases in student learning.

These findings will be discussed in Chapter 5.

Table 4-7: Pearson correlation matrix among quality of collaboration, changes in instructional practice, and perceived changes in student learning.

	Subscale	1	2	3
1.	Quality of Collaboration	_	.513**	.480**
2.	Change IP		_	.711**
3.	Perceived Change SL			_

**$p<0.01$

CHAPTER 5

DISCUSSION AND CONCLUSIONS

Introduction

Previous chapters of this dissertation reviewed the major, largely unsuccessful efforts to reform the public schools since the late 1950s; described the significant gaps, in terms of outcome measures, which persist between various sub-groups of students; situated the context of the professional learning communities approach within the current and widespread emphasis on improving schools in order to achieve better student learning outcomes; reviewed the relevant literature base on the topic of PLCs; outlined the methodology used to address the research questions; and reported the results of the various statistical analyses that were conducted. Chapter 5 will address the results in terms of the four hypotheses that were established prior to conducting the analyses. Connections will be made to existing research, particularly with respect to the significant findings that were identified in Chapter 4. This chapter will also include a discussion of the implications of the results for policy and professional practice, and will provide recommendations regarding considerations for future research.

Overview of the Results and Connections to Existing Research

Research Question One—Examining the Relationship Between Teacher Collaboration and Student Achievement Outcomes

This study examined the impact of professional learning communities on teacher practice and student achievement outcomes. Four main research questions were addressed. The first research question was designed to determine the relationship between teacher collaboration and student achievement outcomes on standardized assessments. No significant relationship was found between the independent and dependent variables;

hence, the hypothesis that higher quality teacher collaboration will be associated with higher levels of student achievement was not supported. One explanation for the lack of a significant relationship may relate to the *ceiling effect*. Gall et al. (2007) described the ceiling effect as occurring "when the range of difficulty of the test items is limited, and therefore scores at the higher end of the possible score continuum are artificially restricted" (p. 439). Moreover, Koedel and Betts (2008) speculated that "criterion-referenced tests are more likely to exhibit ceiling effects" as opposed to norm-referenced tests (p. 2). While norm-referenced tests compare each student's performance to the performance of the group as a whole, a criterion-referenced test compares each student's performance to an absolute standard, e.g., a minimal level of competence in a specific academic subject area (Boslaugh & Watters, 2008; Gall et al., 2007). This study identified student achievement data on a state-mandated, criterion-referenced assessment as the dependent variable. The criterion-referenced assessments used to measure student achievement may certainly be prone to the ceiling effect. Moreover, the fact that the study took place in a high-performing school district (where approximately 95% of the students achieve Connecticut's *proficiency standard* in accordance with NCLB) probably exacerbated this problem, i.e., the students already perform so well that the ceiling effect may have masked any team-level impacts related to differences on the independent variable. As was noted in Chapter 2, Goddard et al. (2007) did find teacher collaboration to be a statistically significant predictor of reading and math achievement on standardized assessments; however, the student sample (roughly 60% minority, roughly 66% eligible for free or reduced-price lunch) these scholars examined differed considerably from the student sample used in the present study.

Research Question Two—Examining the Relationship Between Administrative Support and Student Achievement

Research question two examined the relationship between administrative support for primary PLCs and student achievement. The correlation analyses revealed modest, yet statistically significant, relationships between the independent variable (administrative support) and student achievement in reading and writing (dependent variables). These findings support the hypothesis that higher levels of administrative support for PLCs will be associated with higher levels of student achievement for the two subject areas noted above. However, administrative support for PLCs did not demonstrate a statistically significant relationship with student performance in mathematics and science; hence, the hypothesis was not supported with respect to these two subject areas.

The present study's finding of a significant, positive relationship between administrative support for PLCs and student performance in reading and writing is consistent with the study conducted by Strahan (2003), who found that administrators played an important role in establishing a school-wide reform agenda and implementing grade-level teams that linked professional development to daily classroom practice in three North Carolina elementary schools that had exhibited improved student achievement. Moreover, Leana and Pil (2006) found that both forms of social capital (internal and external) they studied had a direct effect on reading achievement. As was noted in Chapter 2, internal social capital was described by these scholars as the nature of relationships within an organization. Three dimensions of internal social capital were identified: structural, relational, and cognitive. The structural dimension involves information sharing, the relational element involves developing trust, and the cognitive dimension refers to establishing group goals and a common vision. External social capital

was described as the ability of members of an organization to form links with outside entities. Building upon the work of Leana and Pil, the findings in the present study suggest that principals who are perceived to be more supportive are harnessing organizational social capital in order to impact student performance in reading and writing. Viewed through the lens of internal social capital, such principals may be successful in terms of encouraging teachers to share information and provide one another with feedback; they may be successful in fostering trust; and they may be successful in terms of establishing group goals and a common vision that serves as the driving force for PLC meetings. The information in Table 5-1 expands on this point. The table includes several responses to an open-ended item on the *Teacher Collaboration Survey* inquiring about administrative support. These comments illustrate how a principal or supervisor might support the work of PLCs in order to improve student achievement:

Table 5-1: Qualitative responses regarding perceptions of administrative support: In what specific ways have the actions of your administration/supervisor impacted the quality of your primary PLC?

"Our supervisor has really set the tone for how our PLC should look and work. This has really helped us be more effective."
"Providing us with coverage to hold our PLC meetings and giving us time to analyze our data…she also provides feedback on ways to improve student learning."
"She has reminded us to follow certain protocols so that our discussion is focused and meaningful. She always brings us back to the primary focus – student learning and achievement."
"He guides us along. As a PLC, we all share strong core beliefs regarding teaching, student achievement, and goals for improvement."
"Our administrator helps us set our course, guides us, causes us to reflect on practices, helps us interpret data, provides positive feedback and, above all, she demonstrates trust in our abilities and our commitment to the process."

Through the lens of external social capital, perhaps the principals who are viewed as more supportive than their peers have been able to integrate, to a greater extent and more successfully, support from resources outside of the school. As one teacher noted, the principal's effort to "provide professional development with the [external] consultant

and opportunities to use the TCAR (Teacher Collaboration Assessment Rubric) has been helpful."

The finding that administrative support is associated with reading and writing achievement is consistent with the theory of action driving this study. The theory was initially presented in Chapter 1:

> If professional learning communities are properly designed and supported by administrators, and if teachers regularly engage in high-quality professional collaboration focused on analyzing student work, increasing content knowledge, and sharing effective instructional strategies, then teacher practice will improve, resulting in increased student learning.

The most applicable portion of the present study's theory of action to the significant findings relates to the *design* and *support* of PLCs. As was noted earlier, the district took specific steps to ensure that necessary structural components (e.g., regular meeting time for PLCs and revised teacher evaluation standards focused on collaboration and data analysis) were in place. These design elements could have certainly contributed to the results. Furthermore, as the results suggest, teachers' perceptions of support from their administrators are associated with improved student performance in reading and writing. The importance of perceived support cannot be underestimated and will be addressed in the next paragraph.

Leithwood, Patten, and Jantzi (2010) examined the influence of school leadership on student learning, identifying group confidence, or *collective teacher efficacy* (CTE), as a significant predictor (.340, $p<0.05$) for student performance in math, language, and reading. Drawing upon the work of Bandura (1997), they described how CTE is influenced by conditions such as the ability to master the skills required for successful job performance, association with others who are performing at a high level, and the

perception that one is working in a supportive environment. Leithwood et al. posited that school leaders have the potential to impact the conditions that contribute to CTE by engaging in behaviors such as "sponsoring meaningful professional development, encouraging their staff to network with others facing similar challenges to learn from their experiences, and structuring their schools to allow for collaborative work among staff" (p. 677). With respect to the results in the present study, the primary PLCs that produced better results in reading and writing might be benefiting from the fact that supportive administrators are helping them to realize and access the power of their social capital, which I submit is another term closely associated with collective teacher efficacy as defined by Leithwood et al. In other words, supportive administrators are improving a PLC's collective confidence, or CTE, regarding its ability to impact positively student achievement outcomes.

Another explanation for the finding that administrative support was associated with stronger student performance in reading and writing, but not in math or science, might be linked to differences in terms of the way that principals interact with these separate content areas. Burch and Spillane (2003) analyzed the impact of school-level leadership on student achievement in literacy and mathematics at the elementary level and found that "principals were less prominent in leading mathematics instruction compared with literacy instruction" (p. 534). These scholars reported that principals had significantly more interaction with teachers in the area of literacy compared to math, with 87% of principals in the sample reporting daily interaction with teachers in literacy compared to 37% reporting daily interaction in math. In addition, Burch and Spillane found that efforts to improve literacy are often framed around soliciting teachers'

involvement and input, whereas efforts to improve math are frequently focused on the implementation of specific instructional strategies. If indeed principals are more inclined to interact with teachers in the area of literacy (particularly if such engagement involves soliciting teacher input instead of directing teachers to follow prescribed instructional strategies), this may help to explain the findings of the present study. Furthermore, if principals are more likely to engage teachers in the area of literacy, it stands to reason that a great deal of this engagement would occur within the structured, regularly scheduled time devoted to primary PLC meetings.

Research Question Three—The Interaction Effects of the Two Independent Variables on Student Achievement

The third research question focused on the interaction of the two independent variables (teachers' collaboration and administrative support for PLCs) in terms of the combined impact on student achievement. The hypothesis that the interaction of the two independent variables would have a positive impact on student achievement was supported with respect to student performance in both reading and writing. As Figures 4-1 and 4-2 demonstrate, when administrative support is high, student performance increases as collaboration increases, while performance tends to decrease as collaboration decreases. This suggests that the optimal situation for student learning occurs when strong administrative support is provided to teachers who are collaborating at high levels. Intuitively, this appears to make sense; moreover, this notion provides support for the present study's theory of action which identifies both *support* and *collaboration* as key factors that promote improved teacher practice and improved student learning. Furthermore, the findings are consistent with important themes that were addressed in Chapter 2. For example, Hord (2004) identified *supportive and shared leadership* and

collective learning as critical elements of successful PLCs. Likewise, Newmann and Associates (1996) noted that *appropriate roles for administrators* and *collaboration* were essential elements of PLCs. Finally, the fact that the interactions of the predictors have a significant impact on performance in reading and writing, but not for math or science, might be explained by the research conducted by Burch and Spillane (2003), that is, principals are more inclined to engage with teachers in literacy as opposed to math. In my experience within the field of public education, I have sensed that it is socially acceptable, among many teachers and students, to be perceived as "weak in math" or to acknowledge an aversion to math with statements such as "I am no good in math." (Obviously, I would exclude math teachers from this generalization.) While I believe that this phenomenon extends to our larger society as well, I don't sense a similar aversion to literacy. Perhaps within PLCs, teachers are simply more comfortable collaborating in the area of literacy as opposed to mathematics. Furthermore, in my experience, student work in literacy is often open to interpretation, while math tends to be more finite, that is, the answers are either right or wrong. It is also possible that strategies which promote literacy development are easier to embed in multiple curricular areas as opposed to math. Although the questions framed by these observations extend beyond the scope of the present study, future researchers may wish to build upon the work of Burch and Spillane by examining how teachers collaborate differently as a function of the subject area.

No significant findings were noted with respect to the interaction of the two independent variables on the other subject-area sub-tests (math and science); hence, the hypothesis that the two independent variables would have a positive impact on student achievement in these areas was not supported. Once again, it is important to note that the

ceiling effect may have masked the impact of any team-level differences on the independent variables.

Research Question Four—The Relationship Between the Quality of Collaboration and Changes in Teachers' Instructional Practice

The fourth research question addressed the relationship between teacher collaboration and reported changes in instructional practice. A strong, statistically significant relationship (.513, $p<0.01$) was found between collaboration and changes in instructional practice. This finding supports the hypothesis that higher quality teacher collaboration in primary PLCs will be associated with greater changes in teachers' instructional practice. These results build upon four studies that were reviewed in Chapter 3. Strahan (2003) reported that teachers in schools that had demonstrated improved student achievement engaged in "collaborative planning sessions that improved shared teaching practices" (p. 134). Saunders et al. (2009) indicated that teachers serving on grade-level teams in the Getting Results (GR) schools "spent more time discussing the relationship between instruction and student outcomes and worked more on instructional improvements" (p. 1019), when compared to their peers in control schools. Vescio et al. (2008) found that when teachers who participate in PLCs pay specific attention to student learning and achievement, teaching practice changes and has a positive impact on student achievement. Finally, Goddard et al. (2007) reported that teacher collaboration served as a positive predictor for student achievement in reading and math and posited that "the relationship between teacher collaboration for instructional improvement and student achievement is likely indirect. That is, the most important outcome of teacher collaboration may be that teachers learn how to improve their instructional practice" (p. 892). Hence, the present study's findings are consistent with other empirical findings

reviewed in Chapter 2 in terms of the demonstrated ability of PLCs to impact the instructional core. As City et. al (2009) posited, it is only through impacting the instructional core that student learning can be improved.

In contrast to the findings of the present study, some of the studies reviewed in Chapter 2 did not note substantial changes in teachers' instructional practices as a result of the various, PLC-like initiatives under consideration. Supovitz (2002) reported that the Cincinnati teaming model did not significantly impact teaching practices because teachers were grouped without a clear expectation to focus on instruction, while Wood (2007) reported that it was too early in the Learning Communities (LCs) Project to claim any connections between the creation of LCs and impacts on classroom practice and student learning. Both Supovitz and Wood stressed the importance of distinguishing between the *relationship aspect* or *team building process* of PLCs, on the one hand, and maintaining a direct focus on *instruction and student learning*, on the other. Supovitz warned that grouping teachers into teams will not promote changes in teachers' instructional practice and improved student learning unless teachers are provided with professional development that calls explicitly for the interaction of instructional strategies and curriculum, while Wood argued that both aspects of PLCs are important and merit attention. According to Wood:

> The building of relationships ought to happen in tandem with work to improve teaching and learning….In order for the professional learning community to be strong, it must push the work of improving classroom practice and student learning forward. And in order for the work to progress, the community must bond around common commitments, values, and achievements – all work-related. Appreciating both dimensions has become crucial to the success of LC work. (p. 723)

This critical distinction between the two distinct aspects of effective PLC teaming – and the importance of both – may help to explain why the present study identified a rather strong relationship between collaboration and changes in instructional practice. When the district under study implemented the PLC approach in 2007, the superintendent outlined a clear expectation that the intent of the initiative was to improve instructional practice and student learning. This expectation has been consistently reinforced with administrators and teachers through the supervisory process (as noted in Chapter 3, the district's teacher evaluation system requires collaboration with colleagues and the analysis of assessment data) and has also permeated the overall culture of the school district through avenues such as the district's theory of action, regular administrative team meetings, and the on-site work of the external PLC consultants with principals, literacy coaches, and teachers.

The district's urgency to improve learning is certainly consistent with the *instructional focus aspect* identified by both Supovitz (2002) and Wood (2007). Furthermore, many teachers in the district have worked with colleagues on their primary PLCs for a number of years and have developed strong collegial relationships. This speaks to the *relational aspect*. Evidence of each of these two critical aspects of effective PLCs was expressed by a number of teachers' qualitative statements in response to an open-ended question on the *Teacher Collaboration Survey* inquiring about the greatest strength of the PLC. Selected responses were sorted into two categories: those that align with the instructional focus aspect and those that align with the relational aspect. The responses are listed in Tables 5-2 and 5-3.

Table 5-2: Qualitative responses related to the instructional focus aspect of PLCs: Describe the greatest strength of your PLC.

"All members have high expectations for student learning."
"Our PLC is a team. All members work together to improve instruction."
"We always talk about instructional plans and ideas. We focus on lessons, supplemental materials, and what we will do with students to promote learning."
"All members are dedicated to improving student learning."
"The members of our PLC are honest, direct, open-minded professionals who are dedicated to our analysis of our instructional and assessment practices and to our improvement of the same."

Table 5-3: Qualitative responses related to the relational aspect of PLCs: Describe the greatest strength of your PLC.

"We work well together as a team."
"Humor. Because of our relationships we can tease each other."
"Our greatest strength is that we all get along, even though we may disagree about a decision…"
"We are all supportive and understanding of one another and have the same primary goals for students."
"The greatest strength of our PLC is our ability to have professional tension. We respectfully challenge each other's ideas and professional practices without negatively impacting the group dynamic."
"All members respect each other and are committed to continuous improvement of our work with students."

After the data on the *Teacher Collaboration Survey* were examined, a second analysis in relation to question four was conducted. This second analysis examined the relationship between collaboration and perceived increases in student learning. A statistically significant relationship (.480, $p<0.01$) was noted. While the present study did not find a significant relationship between teachers' quality of collaboration and student achievement when the dependent variable was measured by standardized assessments, it is important to remember that this initial finding may have been impacted by the ceiling effect. Hence, this additional finding (based upon participants' responses to the *Teacher Collaboration Survey*) should not be overlooked, for it indicates that teachers who

reported higher levels of collaboration have observed evidence of increased student learning in ways that are not measured by performance on large-scale, standardized tests. The additional analysis also produced a third correlation in Table 4-7 which demonstrates the relationship between changes in instructional practice and reported increases in student learning. This correlation (.711, $p<.01$) is very strong, suggesting that the teachers who reported changing their instructional practices observed evidence of increased student learning. The importance of this finding should not be underestimated, for classroom teachers are in the best position to evaluate the work of their students on a daily basis. Furthermore, the findings relative to research question four are consistent with the theory of action presented in Chapter 1, providing support for the notion that properly designed and supported PLCs do indeed foster changes in instructional practice, and the resulting changes in practice promote increased learning. The finding builds upon the argument advanced by Goddard et al. (2007) that the influence of teacher collaboration on practice is direct, while the influence on student learning is indirect. It is the resulting improvements in teacher practice that have a direct influence on student learning. As Elmore (2005) attested, "improvements in instruction have *immediate* effects on student learning wherever they occur, and these effects are usually demonstrable through skillful assessment and observation of students' work" (p. 129).

Admittedly, more work needs to be done in terms of documenting the impact of PLCs on student learning beyond the use of standardized achievement tests. Vescio et al. (2008) suggested that one idea for future research may involve in-depth, qualitative case studies of students' learning in PLC classrooms over time. Table 5-4 provides a sample of responses to an open-ended item on the *Teacher Collaboration Survey* that inquired

about how student learning has improved as result of the PLC initiative. These responses suggest that teachers in the district under study are seeing evidence of improved student learning in the form of daily classroom work, district assessments, and writing samples.

Table 5-4: Qualitative responses regarding increases in student learning: How has student learning improved as a result of the work of your PLC?

"Our PLC has worked a great deal to improve students' conceptual understandings as demonstrated through their written work. End-of-unit assessments and projects have become more common, and their objectives have been clarified, so that we can speak in our PLC about specific skills that groups of students seem to struggle with, and how greater use of formative assessments may improve these skills..."
"Students have been able to read a ruler more accurately. One of the common assessments we created is a test on reading the ruler. The number and the percentage of students able to read a ruler at or above goal increased after we implemented the changes noted above."
"Our team focused on writing this year. We shared lessons that worked for the six traits of writing. Many of those same lessons were then incorporated in our individual classrooms. Overall scores in the various traits have improved as noted in data collected from assessments."
"Because of our work in my PLC, our students have improved in their ability to respond to text in writing. I specifically focused quite a bit on making connections. When looking at the district's reading assessments from the fall and winter, my students demonstrated drastic improvement in that area."
"My students are more aware of spelling patterns and syllabication when decoding unfamiliar words as a result of the work done in my PLC."
"The learning of at-risk students has shown improvement this year due to our collaboration about these students. Differentiated expectations/learning plans have been built, and instructional practices have been fostered to help improve student performance. Many of my students have improved their writing due to repeated practice in strategy groups. Our continued discussion about these students has made an impact this year."
"Graphing skills were weak according to one common assessment. We devised a plan for remediation, and it seems to have been helpful to some of my students…"
"The learning of at-risk students has improved as a result of strategy group intervention and materials acquired in my PLC. Improvement is documented through district reading assessments and benchmark assessments."
"The sight-reading of my students has improved dramatically thanks to the PLC."

Judged by the both the fidelity standard and the effectiveness standard (Cuban, 1998) presented in Chapter 2, the PLC initiative would appear to be successful. As was noted in Chapter 3, the district adhered strictly to the *Teacher Collaboration Improvement Framework* (TCIF) during the initial implementation (fidelity); in addition, the results for research question four suggest that collaboration is strongly correlated with positive changes in instructional practice and reported increases in student learning (effectiveness).

Finally, the results for question four should be interpreted with some degree of caution. For this research question, all the data for all measured variables were drawn from the *Teacher Collaboration Survey*. As a result, it is possible that the observed correlations could be inflated as a result of *common method variance*, or same-source bias. The common methods (the same survey instrument) may have served as a factor that affected the observed correlations. In other words, the strong correlations could be, to some extent, the result of common method variance as opposed to true relationships between the measured constructs (quality of collaboration, changes in teachers' instructional practice, and reported increases in students' learning). As Podsakoff, MacKenzie, Lee, and Podsakoff (2003) noted, "most researchers agree that common method variance (i.e., variance that is attributable to the measurement rather than to the constructs the measures represent) is a potential problem in behavioral research" (p. 879). Although the potential limitation of common method variance exists with respect to the results for research question four, it is important to make note of the detailed qualitative responses provided by teachers, a sample of which is included in Table 5-4. These detailed descriptions of how collaboration has specifically improved instruction and resulted in increased student learning provide evidence and confirmation of the observed statistical correlations, and serve to counterbalance the potential limitation posed by common method variance.

Implications for Policy, Practice, and Future Research

The results of this study suggest that professional learning communities, if properly structured and supported by administrators, may contribute to improved student outcomes, as measured by standardized assessments, in the areas of reading and writing.

Additionally, the study found that collaboration is positively correlated with changes in instructional practices, and that collaboration is also positively correlated with increases in student learning as reported by teachers. Finally, a very strong correlation emerged between changes in instructional practice and reported increases in student learning. These findings have implications for policy and practice, and future research on the topic, and are addressed in the following sections.

Implications for Policy and Practice

Policymakers and practitioners considering similar reform efforts must take steps to ensure that PLCs are actualized in a proven and effective fashion. As was noted in Chapter 3, the district under study established the conditions necessary to support collaborative teacher work. Regular meeting time, with a corresponding requirement to meet, was established at all schools for each primary PLC. A district theory of action, promoting teacher collaboration and a specific focus on instruction and student outcomes, was created and steps were taken to embed this theory of action into the district's culture. The district changed its teacher appraisal system, creating new evaluation standards designed to promote improved teaching and learning by incorporating specific expectations to collaborate with colleagues and to analyze student assessment data. Furthermore, the district's hiring process was retooled: candidates were asked specific questions about collaboration and teamwork during interviews, and teachers already serving on teams were included on interview panels in order to assist with the selection of prospective members.

Supovitz and Christman (2003) examined teacher teaming initiatives in Philadelphia and Cincinnati. They reported that the efforts in each city failed to improve

student learning outcomes, primarily because the teaming initiatives lacked instructional focus. As these scholars noted:

> Qualitative observations of both small learning communities in Philadelphia and team meetings in Cincinnati schools shed light on why the reforms failed to increase instructional focus. Communities spent little time in discussion about teaching practices or in planning curricula. When instructional topics did arise, interaction took the form of one-way transmissions of information from one teacher to another. As a Cincinnati elementary school team member said, "Team issues are administrative, not academic. It has nothing to do with planning instruction. [There is] all this paperwork coming down from the district and school level." In few cases did communities move to more sophisticated levels of group instructional practice such as collective analysis of teaching or review of student work. (p. 5)

The Philadelphia and Cincinnati experiences serve as a warning to district-level policymakers and practitioners that are interested in implementing PLCs in order to improve student outcomes. Merely grouping teachers into teams through administrative fiat, without concurrently establishing the conditions and expectations that foster collaborative work on issues of *teaching and learning*, is unlikely to improve student outcomes. The district under study took steps to create the climate and structure required for *effective teamwork* while also making a corresponding and explicit commitment to improving *classroom instruction*.

Policymakers and practitioners would be wise to heed the findings reported by Saunders et al. (2009). These scholars suggested that a train-the-principal model was ineffective with respect to improving student achievement outcomes, and they reported that subsequent gains in students' test scores were noted only after the initiative was expanded to include focused institutes or retreats; explicit protocols to guide team-based meetings; and external, on-site support in the form of coaches for both principals and building-based instructional resource teachers. Moreover, the present study's finding of

the positive interaction effects of collaboration and administrative support on reading and writing suggests that optimal learning occurs when principals actively support high quality teacher collaboration. The critical role of the principal in terms of supporting successful PLCs cannot be understated. This is an essential, non-negotiable prerequisite if the goal of improved learning is to be realized. These building-level leaders play a key role in forging a school-wide vision for improved learning, in creating conditions that promote the dual focus on *effective teamwork* and *teaching and learning*, in steering staff development efforts that integrate curriculum with high-leverage instructional strategies, and in ensuring that success stories are celebrated. Below, I have provided a series of recommendations for policymakers and practitioners considering the implementation of professional learning communities:

- Develop a district-wide commitment to improving student achievement and take steps to ensure that this vision permeates all aspects of the school or district culture.
- Establish appropriate structural conditions, e.g., creating regular meeting time for PLCs, either during the school day or during scheduled release time for students; providing opportunities for colleagues to observe peers (either in person or through video recording of lessons).
- Train administrators and teachers in the DDAE process, or a similar process, designed to structure PLC meetings and engage professionals in regular and ongoing discussions about teaching and learning and establish expectations for the use of agendas and the recording of minutes.
- Align supervision and evaluation tools to support the district's vision, ensuring that all professional educators are expected to collaborate, to participate meaningfully in PLC meetings, to analyze student assessment data, etc.
- Provide on-site coaching at the building level for administrators and teachers in order support practices such as the use of protocols for team meetings and the analysis of student assessment data.
- Modify hiring practices to ensure that prospective candidates are a good match for professional learning communities.
- Take specific steps to celebrate accomplishments and recognize success in public forums.

Implications for Further Research

This study examined the impact of professional learning communities on changes in teachers' instructional practices and student achievement outcomes by linking data gleaned from a teacher survey to students' results on a state-mandated, standardized assessment. While important, significant findings were noted, the study was limited due to the fact that the data used in the study were drawn from a single year. Future studies on the impact of PLCs may benefit from a longitudinal design, examining changes in teachers' practice and tracking student performance over time. The first three questions of the present study examined the relationships between the independent variables (teacher collaboration and administrative support for PLCs) and the dependent variable (student achievement) at the elementary and middle school levels only. Future researchers may wish to explore the impact of PLCs on student achievement at the high school level. In addition, the finding that administrative support was associated with improved student performance in reading and writing should be interpreted with caution. The small number of teams (20) involved in the analyses linking administrative support to standardized assessment results in these subject areas was a limitation of the study; hence, future research may benefit from expanding the sample size by selecting a larger school district or multiple school districts. While the administrative support aspect of this study was important, future studies may wish to develop a more comprehensive approach for examining the role of administrators in order to identify the variety of ways in which they influence PLCs.

The present study found that the interaction of collaboration and administrative support served as a predictor for student performance in reading and writing, but had no

predictive value for math and science. Future inquiry into how different subject areas are influenced by teacher collaboration, and whether teachers tend to collaborate on certain subjects more freely and with more enthusiasm than on others might prove beneficial. Such a study would be most useful at the elementary school level, where classroom teachers are generally responsible for teaching multiple subjects.

The present study also contributed the following operational definition for primary PLCs: A team of teachers working together with a common set of students who meet on a regularly scheduled basis in order to (a) collaborate on shared problems of practice, and (b) improve student achievement outcomes. This restricted definition may prove useful to other researchers because, as DuFour (2005) observed, the term *professional learning community* has been applied so loosely, and used so frequently, to describe every imaginable mergence of educators interested in working together "that it is in danger of losing all meaning" (p. 31).

The present study was unique in that it considered the impact of PLCs in an affluent, high-performing district. This lies in sharp contrast to the studies that were reviewed in Chapter 2, as they all took place in settings with high percentages of students who qualified for free or reduced-price lunch. Certainly, the ceiling effect may have masked any team-level impacts related to differences in teachers' quality of collaboration. Moreover, the lack of a significant correlation between collaboration and students' assessment results also suggests that future research in high performing districts should consider the ways in which collaboration impacts other measures of student success. For example, several district- and building-level administrators in the district under study have suggested that while their students generally perform at acceptable

levels and appear motivated to earn high grades, there is a troubling sense that many of them are not fully engaged in the learning process. To that end, these students may not be maximizing their learning opportunities, instead settling for what Larabee (1997) described as "formal educational vouchers" (p. 38), or credentials, that enable them to progress to the next level beyond the K-12 system (college), where they continue to pursue additional credentials in order to improve their social standing. In contrast to school districts that struggle with high drop-out rates and low levels of student achievement, students in affluent districts that are making academic progress, at least with respect to the traditional measures of school success, may be conforming to what Larabee termed the *social mobility* approach to schooling. This approach frames education as a commodity, or a private good used for personal consumption, to be pursued solely in order to gain advantage over one's competitors in the race to achieve socially desirable positions. Along this line of reasoning, students in affluent districts become very good at playing the "game" of school, demonstrating a utilitarian attitude toward doing only what is necessary to earn high grades and accrue the credentials required to advance to the next rung on the social mobility ladder. Future research on the impact of PLCs in high performing districts might consider expanding the evidence of student success to metrics beyond earned grades or standardized test scores by examining student engagement, particularly at the secondary level. In Chapter 2, I cited City et al. (2009), who identified student engagement as one of three elements in the instructional core (the other two were subject-matter content, and teachers' knowledge and skill). As City et al. observed:

> Americans are much more comfortable talking about changing content and teaching than they are about changing the role of the student in instruction….This

> is one big difference between American schools and schools in other countries. Here we spend a great deal of time worrying about *what* we're teaching and *how* it is being taught. In other places, people also spend a great deal of time worrying about *whether* students are actually interested in, actively engaged in, and able to explain how they the students think about what adults are trying to teach them. There are differences in the United States on this score. It is much more common, although still not the dominant practice, in U.S. elementary school for teachers to pay attention to whether students are actually interested and engaged in learning. Most of the instruction we observe in secondary schools is about "delivering" the content and, most importantly, about deciding which students are smart and which are "deserving" of further attainment. The culture of American schools, in its deep structure, is very teacher-centric. (pp. 26-27)

Examining the manner in which teacher collaboration helps schools to become less "teacher-centric" (p. 27), while focusing on how students engage in the learning process would mark a departure from traditional thinking regarding school improvement research. To date, the limited numbers of studies that have considered the impact of PLCs have examined customary school outcome measures; hence, future work in the area of student engagement may prove beneficial.

Conclusion

This study builds upon the existing research base regarding the impact of collaboration on teacher practice and student learning. To date, very few studies of this nature have been conducted, particularly with respect to studies that used student performance on standardized assessments as the dependent variable. Several important, statistically significant findings were noted:

- Administrative support for PLCs was associated with increased student performance in reading and writing.
- The interaction of teacher collaboration and administrative support served as a predictor for student performance in reading and writing, suggesting that optimal learning occurs when teachers in PLCs collaborate at high levels while simultaneously receiving strong administrative support.
- Teacher collaboration was associated with positive changes in instructional practice.

- Teacher collaboration was associated with reported increases in student learning.
- Changes in teachers' instructional practice were associated with reported increases in students learning.

In the current era of accountability, the demands on educators are more intense than ever before. These expectations, coupled with harsh sanctions (such as reconstitution or restructuring) for schools that fail to produce results, have placed an inordinate amount of pressure on educators to improve student performance. The findings in the present study build upon previous research which suggests that professional learning communities may improve teachers' instructional practices, thus translating into improved student outcomes. The findings are consistent with the notion that PLCs are an ideal mechanism for accessing and focusing the often latent power (the social capital) existing within school-based teacher teams; furthermore, they provide support for the study's theory of action: if PLCs are properly designed and supported, then teacher practice will improve, resulting in increased student learning.

The power of the PLC approach lies in its ability to engage educators in collaborative processes where teachers and administrators learn by exchanging ideas and strategies with others who are facing similar problems; where they engage in the regular, ongoing, and critical examination of student work in order to inform their instructional practices; and where they rally around a common vision for improved student outcomes. As opposed to the vast majority of school reform efforts that have occurred in the last 50-or-so years, efforts generally characterized by attempts to tinker with structures and systems outside of the instructional core, the PLC approach – which relies on the collaborative efforts of like-minded professionals – is uniquely situated to make a positive and substantial impact on what transpires *within classrooms* between teachers

and students, thus improving the quality of instruction and promoting increased student learning. If our educational system is committed to ensuring that *all* students are provided with viable and realistic opportunities to overcome barriers and compete on equal footing, then the PLC approach is worth pursuing as a means to help all students learn more effectively. Moreover, the PLC approach is consistent with the democratic ideal, offering a practical avenue for coalescing educators around a common vision for improved student outcomes – a vision which transcends the rather narrow obsession with standardized test scores so prevalent in today's educational realm. As Dewey (Morris & Shapiro, 1993, pp. 120-124) argued so eloquently nearly a century ago, "Only through education can equality of opportunity be anything more than a phrase" (p. 122).

APPENDIX A

TEACHER COLLABORATION ASSESSMENT RUBRIC

TEACHER COLLABORATION ASSESSMENT RUBRIC

Professional Learning Community ↑ … ↓ Disparate Groups

	DIALOGUE	DECISION-MAKING	ACTION	EVALUATION
6 5	a) Agenda for team dialogue is pre-planned, prioritized, and documented. b) All team members meet face-to-face. c) Team dialogue is facilitated and focused on the structured examination and analysis of instructional practice and student performance. d) Professional tension exists, and controversy is resolved "now" or as close to now as possible. e) Team members value and reaffirm their shared purpose - to improve instructional practice and cultivate student learning. f) All members contribute to group performance, there are no "hibernators" or "dominators".	a) The process for making any decision is formal, transparent, understood by all. b) Team regularly makes explicit decisions about the individual and collective instructional practices they will initiate, maintain, develop, and/or discontinue. c) All decisions are informed by data and directly related to the improvement of instructional practice and the cultivation of student learning. d) All decisions are documented.	a) Each team member regularly initiates, develops, and/or discontinues an instructional practice as a result of team decision-making. b) Team member actions are observable, interdependent, pedagogically complex/challenging, and directly related to the improvement of instructional practice and the cultivation of student learning. c) Distribution of action-taking workload among team members is equitable.	a) The team collects and analyzes qualitative and quantitative information about student learning and member teaching practices. b) Data is also collected through peer observation of instruction. c) The team uses student performance data to evaluate the merit of individual and collective instructional practices. d) Evaluation data and findings are shared publicly and form the basis for team dialogue and decision-making.
4 3	g) A documented agenda for team dialogue exists. h) Most group members regularly meet face-to-face. i) The process for team dialogue is occasionally facilitated; conversation is somewhat improvisational and unstructured. j) Discussion is generally related to instructional practice and student performance. k) Professional tension exists, but controversy is rare and/or may go unresolved. l) Most team members express a belief in a common purpose - to improve instructional practice and cultivate student learning. m) Most members contribute to group performance, but sometimes there are "hibernators" and "dominators".	d) An informal process for making decisions exists. e) The team makes decisions about what instructional practices they will initiate, maintain, develop and/or discontinue. f) Some decisions are informed by data about student learning. g) Group decisions are generally transparent and understood by all, however they may not always be documented.	d) Select team members will initiate, develop, and/or discontinue instructional practices as a result of team decision-making. e) Team member actions tend to be interdependent and somewhat complex. f) Actions are tangentially related to the improvement of instructional practice and the cultivation of student learning. g) Distribution of action-taking workload among team members varies.	e) The team infrequently collects and analyzes qualitative and quantitative information about student learning and member teaching practices. f) Data is rarely generated through peer observation of instruction. g) The team relies on "hearsay," "anecdotes," or "recollections" to evaluate the merit of their practices. h) The data that is collected is usually shared publicly and forms the basis for dialogue and decision-making.
2 1	n) Full attendance at team meetings is rare or the group meets face-to-face sporadically. o) Agenda for group dialogue is not planned and documented. p) Dialogue is improvisational and informal, and is not facilitated. q) Controversy does not exist, or exists and goes unmanaged. r) Team members air disagreements to non- team members outside the meetings. s) The purpose of the group is unclear and unrelated to the improvement of instructional practice and student learning. t) Dialogue is almost entirely convivial or members tend to "hibernate" and "dominate."	h) A process for making decisions does not exist. i) The team does not make decisions about what instructional practices they will initiate, maintain, develop and/or discontinue. j) Individuals make their own decisions and these decisions are most often unrelated to the improvement of instructional practice and the cultivation of student learning. k) There are no documented decisions.	h) Team members take minimal action as a result of group decision-making. i) Member actions tend to be individualistic in nature, and involve very little challenge and/or complexity. j) Team actions are not related to the improvement of instruction practice and the cultivation of student learning. k) Distribution of action-taking workload among team members is unequal.	i) The team does not systematically collect or analyze information about student learning and the merit and value of their instructional practices. j) The team relies almost exclusively on "hearsay," "anecdotes," or "recollections" to form the basis of their dialogue and decision-making. k) Team members do not publicly share the effects of their instructional practice.

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APPENDIX B
TEACHER COLLABORATION SURVEY

1. * Public Schools - Spring 2010 Teacher Collaboration Survey

Welcome to the 3rd Annual * Public Schools Collaboration Survey!

The * Public School District has been engaged in an intensive effort to support and improve teacher collaboration. These efforts have included an increase in resources devoted to improving collaboration and time for you and your colleagues to work with one another to examine student work and improve instructional practice.

This survey was developed in consultation with the Administrative Council (all building principals and district directors). In it you'll be asked about your experiences with collaboration in the * Public School District and how collaboration has or hasn't impacted your instructional practice and student learning.

We recognize that there is a great deal of variance in how each of you are experiencing collaboration and understand that your survey responses will reflect where you are in the process. Your thoughtful and honest responses will help us determine the value and merit of our district-wide efforts to improve teacher collaboration and assist in determining how the district can best allocate resources, training, and support for teacher collaboration in the days ahead.

To maintain confidentiality and to encourage free and open sharing of honest responses, survey data will be collected and analyzed in the aggregate. Reports will be generated at the building and district levels, and you will have full access to a summary of the findings.

Thank you in advance for your thoughtful and thorough responses to the survey questions.

2. Confidential Identification Code

In order to see big picture changes over time, this survey will be periodically re-administered. Please provide a unique tracking code that will enable the longitudinal analysis of responses. The tracking code is used solely to conduct valid statistical analyses. Be assured that your individual responses will remain COMPLETELY CONFIDENTIAL. No analysis or reporting will be conducted that would allow the identification of any individuals.

1. Indicate the LAST 2 LETTERS of your LAST NAME, followed by the 2 letter abbreviation of the STATE IN WHICH YOU WERE BORN, followed by

the YEAR YOU GRADUATED from high school.

For example, Christine Gallagher, born in Ohio, who graduated in 1987, would enter:

EROH1987

3. Demographic Information

On this page you will be asked to provide demographic information. This information will be used to analyze responses by groups. Should too few data points show up for a particular response - the item will be eliminated. At no time will individuals be identified.

1. What is your current position?

Other (please specify)

2. What is your gender?

- Female
- Male

3. For how many years have you been licensed/certified to teach?

4. At what location is your primary teaching/administrative appointment?

5. What grade level(s) do you primarily teach/service students?

6. If applicable, what subject matter do you primarily teach?

7. What is your PRIMARY source of ideas for understanding and improving how you teach/service students?

- ☐ Graduate program courses/materials/faculty
- ☐ Professional off-site conferences/meetings
- ☐ Professional books or journals
- ☐ My administrator(s)
- ☐ 1 on 1 conversations with district reading/math specialists
- ☐ District-wide, system-based professional development
- ☐ My own professional experiences
- ☐ On-line professional websites/blogs
- ☐ My primary professional learning community (PLC) team
- ☐ Informal conversations with colleagues
- ☐ Other (please specify)

4. What is your "Primary PLC?"

In this section you will be asked to describe your participation in committee/group work with other teachers/service providers.

1. Out of all the teams and working groups that you belong to, what is the name of the group you belong to whose primary purpose it is to examine student work and improve instructional practice? This group is considered your primary professional learning community or "PRIMARY PLC." (e.g. 9th grade History team, grade level team, department team)

2. How often does your "primary PLC" meet?

☐ 1 hour per week ☐ 1-2 hours per week ☐ 1x per month ☐ 3 hours per week ☐ Only on designated

district/school
PD days

☐ Other (please specify)

3. Including yourself, how many people belong to this "primary PLC?"

☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8+

4. Did this "primary PLC" of which you are a member exist in the previous academic year (2008-2009)?

☐ yes

☐ no

☐ don't know for sure

Comments

5. Other than your primary PLC, about how many other committees or teams do you attend with some frequency in your school/district?

5. Quality of Collaboration in Your Primary PLC

1. The following elements are typical characteristics of high quality teacher collaboration. Rate the extent to which each description characterizes what

generally takes place in your primary PLC.

CHARACTERISTICS of TEACHER COLLABORATION

	My primary PLC is NOTHING LIKE THAT	My primary PLC is NOT LIKE THAT	My primary PLC is SORT OF LIKE THAT	My primary PLC is MOSTLY LIKE THAT	My primary PLC is JUST LIKE THAT
a) All the members of my primary PLC share and express a vision for student learning.					
b) The goal of our collaboration is clear - to systematically improve instruction and increase student learning.					
c) The membership configuration of my primary PLC is appropriate – the right people are members of the group.					
d) Our meetings are consistently attended by ALL members.					
e) We always have a pre-planned agenda for our meetings.					
f) We always keep a record of what happened in our meetings.					
g) Our dialogue is focused on the examination of instructional practice and student performance data.					
h) We utilize specific protocols to structure our dialogue.					
i) We experience healthy professional inter-personal tension and directly address and resolve conflict.					
j) There are no "dominators" or "hibernators" in the group - everyone participates/contributes equally.					
k) We regularly make decisions about what instructional practices to initiate, maintain, develop, or discontinue.					
l) All of our decisions are informed by group dialogue.					
m) Decisions are transparent - everyone knows what the decision is and how and why it was made.					
n) The decisions we make are clearly and directly related to the improvement of instructional practice and the cultivation of student learning.					
o) As a result of group decision-making each one of us makes pedagogically complex adjustments to our instructional practice.					
p) There is always an equitable distribution of workload among team members.					
q) As a group we regularly collect and analyze information about member teaching practices.					
r) As a group we regularly collect and analyze information about student performance.					
s) We observe the classroom instruction of our colleagues.					
t) We use student performance data to evaluate the merit of our instructional practices.					
u) We regularly and publicly share evaluation data in our primary PLC.					
v) The accomplishments of our primary PLC are publicly recognized.					

2. Describe the GREATEST STRENGTH of your primary PLC?

3. Describe an aspect of your primary PLC that NEEDS IMPROVEMENT.

4. What support, resources, training, or changes would help improve collaboration in your primary PLC?

6. Perceptions About Collaboration

1. Please read each statement below about the role of your principal/assistant principal/program director and indicate your response using the rating scale provided.

ROLE OF THE ADMINISTRATOR/SUPERVISOR (PRINCIPAL/ASST PRINCIPAL/PGM DIRECTOR)

	Strongly DISAGREE	Disagree	Neither Disagree nor Agree	Agree	Strongly AGREE	Don't Know/Cannot Determine
a) My Administration/Supervisor promotes a shared vision for teacher collaboration.						
b) My Administration/Supervisor observes my PLC participation.						
c) My Administration/Supervisor monitors the actions and achievements of my primary PLC.						
d) My Administration/Supervisor monitors how the work of my primary PLC impacts student achievement.						
e) I have received individual feedback from my Administration/Supervisor about how I could improve my contribution to my primary PLC.						
f) Our group has received feedback from the Administration/Supervisor about how to improve the quality of collaboration in our primary PLC.						
g) I understand how to use Teacher Collaboration Assessment Rubric (TCAR) as a tool to improve the quality of collaboration in my primary PLC.						
h) My Administration/Supervisor helps my primary PLC to set clear and measurable goals for student learning.						
i) My Administration/Supervisor helps my primary PLC figure out how to monitor our progress and achievements on a continuous basis.						
j) My Administration/Supervisor celebrates the achievements of my PLC.						
k) My Administration/Supervisor uses evidence to identify areas that need improvement in my primary PLC.						

l) **My Administration/Supervisor effectively addresses individuals who are resistant to, or disruptive of, the development of high quality teacher collaboration.**

2. In your experience, over the past 3 months what role has your principal/administrator played in relation to your primary PLC? Check all that apply.

- ☐ Occasional observer
- ☐ Attends most/all of our meetings
- ☐ Visits at the beginning or at the end of our meetings
- ☐ Occasionally facilitates our meetings
- ☐ Requests and collects student achievement/performance data from our primary PLC
- ☐ Provides feedback about how to improve the quality of our collaboration.
- ☐ Provides specific training/support that will improve the quality of our collaboration.
- ☐ Reconfigures the membership of our group.
- ☐ Shares with us her/his vision of teacher collaboration and student performance.
- ☐ Has publicly recognized achievements of our primary PLC.
- ☐ Has not been involved with our primary PLC to any great extent.

Other (please specify)

3. In what specific ways have the actions of your Administration/Supervisor impacted the quality of your primary PLC?

4. What other people have played an active role in the facilitation and/or development of your primary PLC? What influence have they had or what role have they played?

7. Collaboration, Your Instructional Practice and Student Achievement

1. Effect of Your Primary PLC

	Strongly DISAGREE	Disagree	Neither Disagree nor Agree	Agree	Strongly AGREE	Don't Know/Cannot Determine

a) My instructional practice has substantially improved as a result of participating in my primary PLC.
b) The instructional practice of my colleagues has substantially improved as a result of participating in our primary PLC.
c) I have evidence that student learning is increasing as a result of the work of my primary PLC.
d) I believe that collaborating with colleagues is an essential part of my job.
e) Working in my primary PLC has a greater positive effect on my instructional practice than working independently.
f) My primary PLC is intellectually stimulating.
g) I am more satisfied with my job as a result of being able to collaborate with colleagues in my primary PLC.
h) The quality of collaboration in my primary PLC is better than the dynamics of most other working groups that I've been part of at my school/in my district.

2. Describe a specific instructional technique/approach that you used to do, that you now do differently as a result of the influence of your PLC. (Describe both what you used to do and what you do now.)

3. How has student learning been improved as a result of the work of your PLC? Be as specific as possible. Give an example of the specific knowledge and/or skills that student(s) have demonstrated as a result of the work of your PLC.

4. Describe one goal that your PLC set for itself and that it has achieved thus far during the 2009-2010 academic year.

5. It is the belief of the school district that...

"high quality teacher collaboration brings about improvements in instructional practice and increases in student learning that cannot be achieved by individual teachers working independently of one another."

To what extent, and in what ways, do you personally share this belief?

6. To what extent have you experienced an increase in an overall expectation to collaborate (work with colleagues to systematically improve instructional practice and student learning) in this school year as compared to previous years?

The expectation to collaborate is...

- ☐ MUCH GREATER now than in previous years.
- ☐ GREATER now than in previous years.
- ☐ ABOUT THE SAME as previous years.
- ☐ LESS than in previous years.
- ☐ MUCH LESS than in previous years.

7. What resources/information do you want or need that you believe would help improve collaboration and instructional practice for you and your colleagues?

8. Please feel free to share anything else that you wish here...

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