A COMPARISON OF STUDENT ACHIEVEMENT BETWEEN

MISSOURI PROFESSIONAL LEARNING COMMUNITY PROJECT

PARTICIPANTS AND NON-PARTICIPANTS

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A Comparison of Student Achievement Between Missouri Professional Learning Project

Participants and Non-Participants

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ABSTRACT

The purpose of this non-experimental quantitative study was to suggest a response to the following research question: Is there a significant relationship between student scores on the Missouri Assessment Program (MAP) achievement test and the type of Missouri high school attended, PLC or NPLC? This study focused on two populations of high school students in the state of Missouri: those that were participants in the state's Professional Learning Communities Project (PLC) and those that were not participants in the state's Professional Learning Communities Project (NPLC). Both school populations were arranged in a typical ninth through twelfth grade configuration.

The means and standard deviations for 2006 and 2007 eleventh grade communication arts Missouri Assessment Program (MAP) scores and tenth grade mathematics MAP scores were calculated for both populations of high schools. 2006 and 2007 MAP historical data for each student was obtained via the archives of the Office of Social and Economic Data Analysis (OSEDA) at the University of Missouri-Columbia. Using this retrieved database, a model was organized with the following variables: MAP scale score, type of school (PLC or NPLC), IEP status, free/reduced lunch status, and ethnicity. This study evaluated a null hypothesis relating student achievement and type of Missouri high school, PLC or NPLC, in four different contexts: (a) 2006 MAP Communication Arts, (b) 2007 MAP Communication Arts, (c) 2006 MAP Mathematics, and (d) 2007 MAP Mathematics. A significance level of .05 was used to accept or reject the null hypothesis.

It was determined that there was no statistically significant relationship between student achievement and type of Missouri high school attended, PLC or NPLC, in three of the four contexts analyzed: (a) 2006 MAP Communication Arts, (b) 2007 MAP Communication Arts, and (c) 2006 MAP Mathematics. The fourth context, Null Hypothesis 4, was rejected because there was a statistically significant relationship between student performance on the 2007 MAP achievement test in Mathematics and type of Missouri high school, PLC or NPLC.

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TABLE OF CONTENTS

LIST OF TABLES

Table

CHAPTER ONE

INTRODUCTION

Since the 1983 publication of "A Nation at Risk: The Imperative for Educational Reform," a nearly continuous wave of reforms have beset the American public school. The Report suggested that the educational system had settled into a state of mediocrity, and that the noted decline in academic performance was a direct result of inadequacies in the process of schooling—including content, expectations, time, and teaching. The publication claimed that "we have, in effect, been committing an act of unthinking, unilateral disarmament" (National Commission on Excellence in Education, 1983, p. 5). "A Nation at Risk" served as a catalyst for a veritable flurry of school improvement initiatives that came to be known collectively as the "excellence movement." Within two years of the Report, more than 300 state and national task forces had investigated the condition of public education in the United States. The conclusions of these follow-up investigations did not offer new direction, but insisted that schools simply needed to do more (Alsalam and Ogle, 1990). In the two and a half decades that have followed the issuance of "A Nation at Risk," each American president has implemented a broad educational initiative outlining high expectations for student achievement, including "America 2000," "Goals 2000," and most recently, "No Child Left Behind" (Reese, 2005). And according to Orenstein and Hunkins (2004), each of these reports was supported by the following trends:

1. core academic coursework had been replaced with elective and remedial courses;

2. grades were inflated while students' homework requirements declined;

3. a documented annual decline in SAT scores between the years of 1963 and 1988;

4. poor ranking of United States students in international comparisons of academic achievement;

5. a high population of functionally illiterate American adults and an increase in the illiteracy rate among American youth, particularly among minorities; and

6. recorded complaints of military and business leaders stating that the need for costly employee skill-related remediation programs had increased.

The response of the state of Missouri to these documented trends and recent federal mandates began with the passage of state Senate Bill 380 in 1993. Known as the "Outstanding Schools Act," the law mandated that Missouri adopt academic performance standards to "establish the knowledge, skills, and competencies necessary for students to successfully advance through the public elementary and secondary education system of the state; lead to or qualify a student for high school graduation; prepare students for postsecondary education or the workplace or both; and are necessary in this era to preserve the rights and liberties of the people" (Outstanding Schools Act, 1993).

In response to this legislation, the Missouri State Board of Education commissioned Department of Elementary and Secondary Education (DESE) to develop the "Show-Me Standards"—a set of rigorous academic criteria designed to inform and align the curriculum of all public schools within the state. The law also dictated the creation of a performance-based assessment system to measure the progress of students toward the Show-Me Standards. DESE engaged teachers, school administrators, parents, and business professionals throughout the state to develop both the Show-Me Standards and the assessment designed to evaluate student proficiencies. Resultantly, the Missouri

Assessment Program (MAP) was developed and implemented in 1997. The criterion-referenced MAP measures student progress in relation to the knowledge, skills, and competencies that all Missouri students are to have acquired by the time of high school graduation.

In 2000, the Missouri Department of Elementary and Secondary Education (DESE) assigned a group of representatives to "explore school improvement initiatives focused on the secondary school" (Department of Elementary and Secondary Education, 2007a). Soon after, the Department enlisted selected secondary schools to create professional learning communities that would serve as models and mentors for others. As more schools sought to engage in a similarly-sponsored work, the Department developed a process during the 2003-2004 school year that would apply the framework to schools of all grade levels and would function to provide ongoing training and support. The Missouri Professional Learning Communities Project began with staff located in four regional professional development centers. By 2007, over 200 Missouri schools had received designation as participants in the state's Professional Learning Communities Project. During the 2007-2008 school year, the need for professional learning communities support resulted in nearly doubling the number of staff statewide with resources now available in each of the nine regional professional development centers (Department of Elementary and Secondary Education, 2007a).

According to DESE, the goal of the Missouri Professional Learning Communities Project is to "help schools in Missouri engage in sustained, substantive school improvement that will result in better outcomes for all of their students, especially in the area of student performance on the Show-Me Standards" (Department of Elementary and

Secondary Education, 2007b). The state's PLC school-improvement model focuses on

increasing student achievement by "building the capacity of school personnel to create

and sustain the conditions that promote high levels of student and adult learning"

(Department of Elementary and Secondary Education, 2007a). Any school or district, at

any level, can begin the professional learning communities process. The Department

describes the project thusly:

> A comprehensive school improvement program that offers guidance to Missouri
>
> schools in their efforts to focus on the fundamental purpose of schooling
>
> (learning), develop a vision of their ideal school where all students learn, commit
>
> to behaviors that will help reach the vision, and set goals that are specific and
>
> strategic, measurable, achievable, results-oriented, and time bound. In a PLC,
>
> school efforts focus on improving student achievement. (Department of
>
> Elementary and Secondary Education, 2007b, p. 1)

To support the work of Professional Learning Communities Project schools,

DESE offers ongoing training, technical assistance, and support through its nine regional

centers housed on the campuses of five state universities. In the first year of project

participation, leadership teams from each school site attend a four-day summer academy

held in mid-Missouri. Team members are introduced to the components of the

Professional Learning Communities Model during this time and are prepared to become

coaches in their schools. Team members then meet one day a month at their respective

regional center to receive additional professional development and support as they

implement the Professional Learning Communities Model. Staff members from the

regional center, then, commit to making a minimum of two full days of site visits to each

participating school. During these visits, staff members work with a school's collaborative teams, bring additional information or resources, and observe classroom practices.

Teams from "continuing" Missouri Professional Learning Community project schools meet three to four times per year. Professional development in PLC philosophy and process is administered, but the emphasis is placed on training to help staff improve instruction and assessment. In the spring of the second year of project participation, two evaluators visit each project school for one full day. The evaluators utilize a rubric developed by the DESE School Improvement Initiatives Section to determine if the school improvement model is in place. The school, in conjunction with regional center staff, then works to develop an action plan for the coming [third] year based on the findings of the rubric. On-site assistance and mentor visits are continuously provided to each school, and additional training, professional development, and a collection of resources is offered and maintained by DESE at each of its regional centers.

In the fourth year of participation and beyond, professional development for participating schools focuses on revitalization. Project schools commit to the re-examination of their vision and goals and renew the philosophy of the professional learning communities model. DESE regional centers provide professional development activities that are individualized and based on the particular needs and goals of each participant school. Often these "mature" schools become mentors to new project schools. Individuals within these schools frequently become presenters at project-sponsored meetings and programs, assist in the evaluation of second-year project schools, and serve on a variety of committees. The emphasis for these "mature" schools is centered on

assuring that the capacity to sustain the work of systemic improvement has been established and embedded within the culture of the school.

Purpose of the Study

The purpose of this study was to suggest a response to the following research question: Is there a significant relationship between student achievement scores on the MAP and the type of Missouri high school attended, PLC or NPLC?

Research Hypotheses

Null Hypothesis 1. There will be no significant relationship between the 2006 MAP Communication Arts achievement scores of eleventh grade students and the type of Missouri high school attended, PLC or NPLC.

Null Hypothesis 2. There will be no significant relationship between the 2007 MAP Communication Arts achievement scores of eleventh grade students and the type of Missouri high school attended, PLC or NPLC.

.   Null Hypothesis 3: There will be no significant relationship between the 2006 MAP Mathematics achievement scores of tenth grade students and the type of Missouri high school attended, PLC or NPLC.

Null Hypothesis 4: There will be no significant relationship between the 2007 MAP Mathematics achievement scores of tenth grade students and the type of Missouri high school attended, PLC or NPLC.

Research Design

The decision of a school site to participate in the Missouri Professional Learning Communities Project cannot be manipulated in the proposed investigation. As such, the research method employed herein was causal-comparative and correlational in design. To

reduce threats to internal validity, all participants of the populations described above were included in the investigation. Participants in the Missouri Professional Learning Communities Project were identified from the website of the *School Improvement Initiatives* section of the Department of Elementary and Secondary Education. Missouri Assessment Program (MAP) historical data for each school was obtained via the archives of the Office of Social and Economic Data Analysis (OSEDA) at the University of Missouri-Columbia. Additionally, descriptive data related to factors of ethnicity, socio-economic status, and student participation in special school services were included in the database provided by OSEDA. After statistical procedures were applied, alternative explanations for any outcomes, including common cause, reverse causality, and other possible variables, were examined.

<div align="center">Significance of the Study</div>

Much of the published research related to the implementation of the school-based professional learning community and any resulting student achievement gains is qualitative in design. Individual schools and districts have documented proficiency gains upon implementing the structure. While this literature is convincing, wide-scale comparison between those districts that embrace the framework and those that do not is scarce. The proposed research purposes to identify the achievement status of both types of institutions, and seeks to quantitatively determine if any statistically significant relationship between student performance and district practices—as related to the state-supported establishment of a professional learning community—exists.

The conclusions of this research could offer empirical data to support the implementation of the Professional Learning Community Model in other schools. If

significant achievement gains are noted in the profiled population, the argument for the framework becomes one aimed at increasing student performance and promoting academic success, rather than supplementing teacher professional development.

<div align="center">Definition of Terms</div>

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

1. Annual Performance Report (APR)—Information published by the Missouri Department of Elementary and Secondary Education describing student enrollment by race, graduation rate, aggregated and disaggregated MAP achievement data, attendance rate, and program enrollment for each public school district.

2. Adequate Yearly Progress (AYP)—Annual proficiency targets established by the United States Department of Education for communication arts and mathematics.

3. Individualized Education Plan (IEP)—designation assigned to students with a disability or other needs that require the services of special education professionals.

4. Missouri Assessment Program (MAP)—one of several educational reforms mandated by the Outstanding Schools Act. The Missouri Assessment Program functions to develop performance-based assessments that measure student achievement as it relates to the Show-Me Standards.

5. MAP Achievement Levels—a description of achievement reported in terms of four performance levels on a continuum to proficiency: Below Basic, Basic, Proficient, and Advanced.

6. MAP Achievement Test—a criterion-referenced assessment tool designed to evaluate student proficiencies in relationship to the Show-Me Standards; comprised of assessment items that are both subjective and objective in format and measures student achievement in communication arts, mathematics, and science.

7. MAP Scale Score—a score that describes achievement on a continuum that in most cases spans the complete range of grades 3-8, 10, and 11. These scores range in value from 450 to 910 and determine the achievement level of the student.

8. Outstanding Schools Act—enacted by the Missouri Legislature in May, 1993. The act, also known as Senate Bill 380, established a variety of programs and policies purposed to address the quality of Missouri's public schools and the inequity of the state funding system.

9. Professional Learning Community—a school improvement model that purposes to increase student achievement by building the capacity of school personnel to create and sustain the conditions that promote high levels of student and adult learning.

10. Socioeconomic status (SES)—Designation assigned to students in receipt of free or reduced school meals.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The purpose of this study was to suggest a response to the following research question: Is there a significant relationship between student achievement scores on the MAP and the type of Missouri high school attended, PLC or NPLC? The literature presented herein purposes to describe the theoretical framework of the professional learning community, define the role of the school leader within that framework, explore the perceived benefits of teacher collaboration, identify the obstacles to effective collaboration, and examine achievement outcomes in schools that have embraced the professional learning community model of improvement. This review of related literature is divided into seven sections: theoretical framework, the role of the administrator in the school-based learning community, impediments to the development of a school-based learning community, achievement outcomes in elementary school-based learning communities, achievement outcomes in middle school-based learning communities, achievement outcomes in high school-based learning communities, and the purported benefits to teachers as members of learning communities.

Theoretical Framework

In 1990, author Peter Senge reintroduced the concept of the learning organization to American corporations and institutions. In his work, *The Fifth Discipline: The Art and Practice of the Learning Organization,* Senge suggested that performance motivated by a quest for outside approval—rather than learning to become adaptable and able to generate

creative solutions to dilemmas—typically manifested in the conditions that ensure

mediocre performance. Senge argued that employees and leaders were paralyzed by self-

imposed control mechanisms that force the maintenance of organizations as "machines."

Rather than reflecting trust in those across the organization to use creativity to devise

localized solutions to problems—solutions consistent with the purpose and values of the

overall organization—solutions were typically pre-fabricated and inadequately suited to

effectively address the problem at hand.

Alternatively, Senge advocated an organizational structure that reflected the

complex, interdependent, and changing nature of contemporary society. Such an

organization, Senge maintained, was oriented toward learning rather than the afore-

mentioned controlling mechanisms. The author described this newly conceptualized

learning organization as one "where people continually expanded their capacity to create

the results they truly desire, where new and expansive patterns of thinking are nurtured,

where collective aspiration is set free, and where people are continually learning how to

learn together" (Senge, 1990, p.3). According to Senge, genuine learning organizations

were characterized by the functional operation of five disciplines, or "bodies of theory

and technique that must be studied and mastered to be put into practice" (1990, p. 10).

These disciplines included personal mastery, mental models, shared vision, team

learning, and systems thinking.

Personal mastery was described as "continually clarifying and deepening

personal vision…focusing energies…developing patience, and seeing reality objectively"

(Senge, 1990, p. 7). Senge insisted that each member of a learning organization must

work to elucidate what is personally important while maintaining a realistic perspective

of current reality. Individuals who attained a heightened level of personal mastery typically understood the purposes that underlay their vision and goals and were concurrently inquisitive and introspective—often embracing change rather than resisting it. Elsewhere Langford (2003) argued that personal mastery initially enriched the individual, and eventually others, through shared collective learning. Senge maintained that, without personal mastery, individuals and organizations typically approached life and worked from a reactive—rather than a creative—viewpoint.

Mental models were defined by Senge as "deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action" (1990, p. 8). These models or mindsets were regularly influenced by factors that included gender, socioeconomic status, era in which one experienced childhood, one's stage of life and/or career, and one's individual sense of realism (Fullan and Hargreaves, 1996). Mental models typically functioned tacitly, "existing below the level of awareness" (Senge et al., 2000, p. 67). Senge suggested that differences in mental models explained why two individuals could witness the same event and describe it differently—each individual gave attention to different details. Mental models thus limited the ability of the individual to change, as most people—when encountered with a new experience—were "drawn to take in and remember the information that reinforces existing mental models" (Senge et al., 2000, p. 67). The discipline of mental models sought to bring these implied assumptions to the surface, so that people might explore and discuss differences and misunderstandings with minimal defensiveness, and avoid behaviors that often included "avoiding self-directed public attention, withdrawing from the situation, [and] refusing outright to participate"

(Rosenholtz, 1991, p. 42). To that end, authentic learning in an organization happened only when members "expose their own thinking effectively and make that thinking open to the influence of others" (Senge, 1990, p. 9).

According to Senge, a *shared vision* was a particular mental image of what was important to a learning organization, one that connected its people by a common aspiration. Vision established an overarching goal that compelled new ways of thinking and acting, and provided the direction required to keep the learning process on course when stresses developed. Senge insisted that when a vision was shared, individuals were "more likely to expose [their] ways of thinking, give up deeply held views, and recognize personal and organizational shortcomings" (1990, p. 209). Huffman and Hipp (2000) similarly argued that creating an understanding of the need for a shared vision was a vital starting point in the process for creating organizational change. While adaptive learning was possible without a shared vision, "generative learning occurs only when people are striving to accomplish something that matters deeply to them—a vision that they truly want to accomplish" (Senge, 1990, p. 206).

Team learning was the process of "aligning and developing the capacity of a team to create the results its members truly desire" (Senge, 1990, p. 236). Dilworth (1995) insisted that the team functions as the "essence of a learning organization," (p. 252) and Hipp and Huffman (2003) maintained that there was a critical link between collective or team learning and shared personal practice. Team learning was based on the concept of alignment, or "arranging a group of scattered elements so they function as a whole by orienting them all to a common awareness of each other, their purpose, and their current reality" (Senge et al., 2000, p. 74). In *The Fifth Discipline: The Art and Practice of the*

Learning Organization, Senge defined three critical dimensions of team learning. First, teams must have learned to think deeply about complex issues by eliciting the collective knowledge of all members. Each member of the team brought their own knowledge to the discussion of the problems or issues at hand (Langford, 2003). Second, teams must have developed a sort of "operational trust" in which each individual remained conscious of other team members and could be counted on to act in ways that complemented each others' actions. As this trust was cultivated, team members were increasingly willing to invest in collective responsibility (Hord, 2004). Third, members of a learning team must have had roles in and responsibilities to other teams if the practices and skills of team learning were to be inculcated more broadly in the organization. Senge insisted that team learning was vital because teams, not individuals, were the fundamental learning unit in modern organizations, and "unless teams can learn, the organization cannot learn" (Senge, 1990, p. 10).

Each discipline of the learning organization was concerned with "a shift of mind from seeing parts to seeing wholes, from seeing people as helpless reactors to seeing them as active participants in shaping their reality, from reacting to the present to creating the future" (Senge, 1990, p. 69). But Senge insisted that, in the absence of the fifth discipline, there was neither the incentive nor the means to integrate the other learning disciplines into the framework of the organization. *Systems thinking* was the "ability to understand (and sometimes to predict) interactions and relationships in complex, dynamic systems: the kinds of systems [human beings] are surrounded by and embedded in" (Senge et al., 2000, p. 239). Thompson, Gregg, and Niska (2003) defined systems thinking as a "body of knowledge and tools that help [to reveal] underlying patterns and

how they can be changed" (p. 2). Within an organization, individuals were often unable

to perceive the complete pattern of change because of a preoccupation with the "smaller

picture." The discipline of systems thinking provided a different way of interpreting

problems and goals—not as isolated events but as components of larger structures.

Because systems were made up of interconnecting parts, change in any part of the system

was likely to require accommodating and supporting changes in other parts as well.

Those who would effort to change a system, therefore, must have devised a map of the

possible connections between various components of the system (Schlechty, 1997).

Bolman and Deal (1991) maintained that systems thinking must have become part of the

culture of the organization if sustainable, systemic reform was to be realized. According

to Senge, systems thinking ultimately "simplifies life by helping us to see the deeper

patterns lying behind the events and the details" (1990, p. 73).

In the year that followed the publication of *The Fifth Discipline*, the notion of the

learning organization made its foray into the realm of educational leadership. The idea of

a learning organization "where people continually expand their capacity to create the

results they truly desire, where new and expansive patterns of thinking are nurtured,

where collective aspiration is set free, and where people are continually learning how to

learn together" (Senge, 1990, p. 3) caught the rapt attention of educational professionals

struggling to reinvent and reform American schools. As the paradigm was explored by

educators and shared in professional journals, the model eventually became known as

learning communities—a phrase that has become "well integrated into the lexicon of

American education" (Hord, 1997, p. 6). Astuto et al. (1993) proposed three related

communities: (1) the professional community of educators, (2) learning communities of

teachers and students both within and outside the classroom, and (3) the stakeholder

community. From this, Astuto and colleagues defined the *professional community of*

learners as one in which the teachers in a school and its administrators continuously

sought and shared learning, and acted on their learning.

In a 1995 report on successful school restructuring, Newmann and Wehlage

suggested that, "if schools want to enhance their organizational capacity to boost student

learning, they should work on building a professional community that is characterized by

shared purpose, collaborative activity, and collective responsibility among staff"(p. 37).

The authors' analysis of 820 research studies concluded that the success of a school

depended on the commitment and competence of individuals within the school. In a

subsequent longitudinal study of "how the tools of restructuring can be used to elevate

learning for all students" (p. 2), Newmann and Wehlage concluded that reform alone or

in combination with other reform efforts did not substantially improve student

achievement. Instead, the ability of a school to organize or develop the values, beliefs,

and technical skills of its educators was found to be more important for the enhancement

of student learning. Additionally, the authors found that professional development was

more likely to positively impact student learning when it addressed the learning needs of

teachers, focused on shared mission and goals, had effective leadership, and was carried

out in a collaborative environment. In summary, the research efforts of Newman and

Wehlage identified four interconnected factors that contributed to improved student

outcomes:

1. *Student learning*. Teachers agreed on a vision of authentic and high-quality

    intellectual work for students that included intellectually challenging learning

tasks and clear goals for high-quality learning. This vision was clearly

communicated to students and parents.

2. *Authentic pedagogy*. High quality student learning was achieved in classrooms

   through authentic pedagogy, and students of all social backgrounds benefited

   equally, regardless of race, gender, or family income.

3. *Organizational capacity*. In order to provide learning of high intellectual quality,

   the capacity of the staff to work well as a unit must have been developed. The

   most successful schools functioned as professional communities, where teachers

   helped one another, took collective responsibility for student learning, and worked

   continuously to improve their teaching practices. Schools with strong professional

   communities offered more authentic pedagogy and were more effective in

   encouraging student achievement.

4. *External support*. Schools needed essential financial, technical, and political

   support from districts, state and federal agencies, parents, and other citizens.

In 1996, following two years of study and discussion, the National Commission

on Teaching and America's Future found that the main educational challenge facing the

United States was that "schools must help the vast majority of young people reach levels

of skill and competence that were once thought to be within the reach of only a few"

(Darling-Hammond, 1996, p. 193). The Commission documented that graduation rates

and student achievement in most subjects had remained flat or had increased only

slightly, and that fewer than ten percent of high school students could read, write,

compute, or manage scientific material at the high levels required for the "knowledge

work jobs" common in present-day society. This complex, knowledge-based society, the

Commission maintained, suggested new expectations for educators: "To help diverse learners master more challenging content, teachers must go far beyond dispensing information, giving a test, and giving a grade. They must themselves know their subject areas deeply, and they must understand how students think, if they are to create experiences that actually work to produce learning" (Darling-Hammond, 1996, p. 194).

In response to its findings, the Commission published the following statement: "We propose an audacious goal…America will provide all students with what should be their educational birthright: access to competent, caring, and qualified teachers" (Darling-Hammond, 1996, p. 193). The Commission concluded that the reform of elementary and secondary education depended on a restructuring of the teaching profession. The report insisted that, to reach the specified goal, "teachers must have available to them schools and school systems that are well designed to achieve their key academic mission: they must be focused on clear, high standards for students; organized to provide a coherent, high-quality curriculum across the grades; and designed to support teachers' collective work and learning" (p. 193). The Commission, citing a lack of regular time for teachers to consult together or to learn about new teaching strategies, recommended that schools be restructured to become genuine learning organizations for both students and teachers: organizations that respect learning, honor teaching, and teach for understanding (Darling-Hammond, 1996). And in 2003, the Commission identified the creation of "Strong Learning Communities" as one of its three core strategies for improving both teaching and schools:

Quality teaching requires strong, professional learning communities. Collegial interchange, not isolation, must become the norm for teachers. Communities of

learning can no longer be considered utopian; they must become the building

blocks that establish a new foundation for America's schools. (National

Commission on Teaching and America's Future, 2003, p. 17)

Two years after the issuance of the 1996 report by the National Commission on

Teaching and America's Future, Richard DuFour and Robert Eaker published

Professional Learning Communities at Work: Best Practices for Enhancing Student

Achievement (1998). According to the authors, each term in the phrase *professional*

learning community was purposely chosen. The word *professional* suggested "someone

with expertise in a specialized field, an individual who has not only pursued advanced

training to enter the field, but who is also expected to remain current in its evolving

knowledge base" (p. xi). *Learning* was selected because it "suggests ongoing action and

perpetual curiosity…the school that operates as a professional *learning* community

recognizes that its members must engage in ongoing study and constant practice that

characterize an organization committed to continuous improvement" (p. xii). DuFour and

Eaker maintained that educators "must engage in the ongoing study and constant practice

that characterizes an organization committed to continuous improvement" (p. xii). The

authors selected the term *community* to support the contention that educators must "create

an environment that fosters mutual cooperation, emotional support, [and] personal growth

as they work together to achieve what they cannot accomplish alone" (p. xii).

In the same work, DuFour and Eaker (1998) outlined six essential characteristics

of professional learning communities (PLCs): (a) shared mission, vision, and values; (b)

collective inquiry; (c) collaborative teams, (d) action orientation and experimentation, (e)

continuous improvement, and (f) results orientation (pp. 25-29). Other authors have

similarly defined the concept. A year prior, reformist Shirley Hord, in conjunction with the Southwest Educational Development Laboratory, organized five dimensions or themes of learning communities gleaned from an extensive review of literature:

1. *Shared and supportive leadership* requiring the "collegial and facilitative participation of the principal who shares leadership—and thus, power and authority—by inviting staff input and action in decision-making"

2. *Shared values and vision* including an "unwavering commitment to student learning that is consistently articulated and referenced in the staff's work."

3. *Collective learning and application of learning* requiring "school staff at all levels [to be] engaged in processes that collectively seek new knowledge among staff and application of the learning to solutions that address students' needs."

4. *Supportive conditions* including "physical conditions and human capacities that encourage and sustain a collegial atmosphere and collective learning," and

5. *Shared practice*, involving the review of teachers' behavior by colleagues and "includ[ing] feedback and assistance activity to support individual and community improvement" (Hord, 2004, p. 7).

These themes were interlaced in Kruse and Louis' 2001 characterization of effective PLCs, which reiterated the importance of:

1. *Shared norms and values* in which members of the school community affirmed, through language and action, common beliefs and attitudes about children, teaching and learning, and commitment to what was good.

2. *Reflective dialogue* distinguished by regular conversations among teachers focused on student learning, instructional concerns, and best practices.

3. *De-privatization of practice* in which teachers were committed to sharing and trading roles as mentor, advisor, and specialist.

4. *Collaboration* typified by the regular exchange of expertise and understanding.

5. *Time* allocated for teachers to meet, plan and talk.

6. *Physical proximity* as provided by common places for teachers to meet, and

7. *Communication structures and processes* that had encouraged and fostered the exchange of ideas within and across grade levels within the school.

Elements of these characterizations of professional learning communities appeared elsewhere in literature related to effective educational practice. In 2003, author Robert Marzano—in cooperation with the Association for Supervision and Curriculum Development—published *What Works in Schools: Translating Research into Action*. That work purposed to organize 35 years of educational research into "three general factors that influence student academic achievement: (a) school-level factors, (b) teacher-level factors, and (c) student-level factors" (p. 10). In his meta-analysis of research related to school-level factors, Marzano identified the importance collegiality and professionalism, defined as "the collective personality of a school based upon an atmosphere distinguished by the social and professional interactions of the individuals in the school" (p. 61). The author also contended that the efficacy of teachers is "grounded in [their] perception that they can effect change in their schools. To do this, [teachers] must have been a valued and critical part of the school's policy-setting mechanism" (p. 62). Elsewhere, Newmann and Wehlage (1995) added:

> When schools are unable to coordinate teachers' diverse aims for students into
>
> curricular mission focused on high quality student learning, when teachers have

few opportunities to work together to devise approaches suited to the school's student body, or when schools pursue multiple innovations without sustained, long-term consistency, it is difficult for even the most gifted teachers to make a positive difference for students. (p. 29)

To foster collegiality and professionalism, Marzano recommended that schools have taken the following action steps:

1. Established norms of conduct and behavior that engender collegiality and professionalism.

2. Established governance structures that allow for teacher involvement in decisions and policies for the school.

3. Engaged teachers in meaningful staff development activities.

These action steps were reflected in the 2003 revision of the standards of the National Staff Development Council (NSDC). In its publication, the NSDC explicitly referenced the importance of collegiality and the professional learning community: "[Effective] staff development [is one] that improves the learning of all students [and] organizes adults into learning communities whose goals are aligned with those of the school and district. (p. 13). Further, the NSCD recognized the professional learning community as an effective way for teachers to learn from colleagues, engage in problem solving, and work to advance the achievement of students. Additionally, the NSCD referenced a series of desired expectations of the learning community, including:

1. The preparation of teachers for skillful collaboration.

2. The creation of an organizational structure that supported collegial learning.

3. An understanding and implementation of an incentive system that ensured collaborative work.

4. The creation and maintenance of a learning community that supported teacher and student learning.

5. Participation with other teachers and/or administrators in one or more learning communities (pp. 60-61).

According to Hord (2004), there were distinct parallels between the issues with which low-performing schools struggle and the dimensions that support PLCs in higher-performing schools. Low-performing schools often "lack the organizational supports that PLCs require and that enable schools to run efficiently and effectively" (p. 13). Hord insisted that these failing schools frequently lack the structures for strong communication among school staff, district staff, parents, and community members that were typically observable in PLC schools. The author argued that low-performing schools were regularly deficit in staff-wide understanding and focus on improvement strategies, and that there was little support for teachers to learn new or more effective instructional practices. Alternatively, Hord cited evidence suggesting that schools in which teachers acted in collaborative settings to discuss instructional practices often gained student learning results more quickly than schools that did not.

Research suggested that the success of high-achieving schools was attributable to a collaborative culture focused on teaching and learning. Data also showed that low-performing schools could overcome the implementation problems that often accompany reform efforts—and increase student achievement—when the staff and school were organized as a professional learning community (Morrissey, 2000). According to Little,

"School improvement is most surely and thoroughly achieved when teachers engage in frequent, continuous, and increasingly concrete and precise talk about teaching practices…adequate to the complexities of teaching, capable of distinguishing one practice and its virtue from another" (1990, p. 527). This collaboration—commonly organized into the structure of the professional learning community—aimed to foster collegiality, counter teacher isolation, and improve teacher practice and student learning (Achinstein, 2002).

The Role of the Administrator in the School-Based Learning Community

Jackson and Davis (2000) insisted that "no single individual is more important to initiating and sustaining improvement in…students' performance than the school principal" (p. 157). In other literature, Louis and Krause (1995) identified the supportive leadership of the building principal as one of the necessary human resources for schools to become a professional learning community. Practitioners in pre-Kindergarten through 12th grade settings had historically understood schools as rational institutions featuring linear lines of communication, top-down decision making, differentiation of tasks, hierarchical supervision, and formal rules and regulation (Sergiovanni, 1994). As such, it was not uncommon for teachers and administrators to be predisposed to a "chain of command," rather than a "communities of practice," way of thinking and doing. Eaker and DuFour (2002) contended that "one of the most fundamental cultural shifts that takes place as schools become professional learning communities involves how teachers are viewed. In professional learning communities, administrators are viewed as leaders of leaders and teachers are viewed as transformational leaders" (p. 22). Therefore, leaders must have moved beyond traditional leadership styles to create professional learning

communities where the goal was to develop people, including oneself (Jackson and Davis, 2000).

In a study of five schools that successfully operated as a professional learning community, researchers from the Southwest Educational Development Laboratory found that the actions of building-level administrator were critical to the creation and sustenance of the framework (Hord, 2004). The teachers' perceptions of those actions were equally important to the effectiveness of the professional learning communities that were examined. Staff members in the studied schools reported benefiting from "close professional interactions with their principals," (p. 23) and articulated the belief that their principal "trusted and treated them as professionals" (p. 24). These leaders provided extensive opportunities for teachers to learn and made overt efforts to model their own learning. Each of the studied schools employed principals that had developed an organizational structure to incorporate and support staff involvement in decisions for the school—a strategy that served to increase both the capacity and the commitment of faculty for taking responsibility for their schools. The researchers found that the principals had made concerted efforts to create conditions that were optimal for teachers to adapt to new ways of working in the school—including both organizational structures and human relationships. These profiled building leaders led their teachers to work and learn with a common purpose—a focus on student success.

Fullan (2002) strongly encouraged building administrators to build the capacity of teachers to become leaders. The author insisted that principals accomplish this by empowering teachers and providing them with the necessary guidance to develop leadership for the future. Additionally, Fullan maintained that leadership capacity was

expanded when teachers had the necessary skills and training to assume new roles in the

organization. Likewise, Hord (1997) suggested that the shared distribution of leadership

was critical in the development of successful learning communities. Morrissey (2000)

argued that in professional learning communities, the traditional role of omnipotent

principal must be replaced by a structure of shared leadership. Despite the insistences of

these researchers, many principals have been traditionally reluctant to relinquish control

and continue to operate out of a traditional paradigm of leadership (Elmore, 2000).

Elmore argued that "top down mandates" have not effectively engendered ownership or

commitment among teachers. Empirical support for these assertions was documented in

research reported by Kruse and Louis (1995) and Newmann and Wehlage (1995). Both

sets of authors offered evidence that a shared commitment to student achievement on the

part of teachers and administrators correlated with increased assessment scores in

reading, math, science, and social studies.

This sort of empirical support has effectively garnered the attention of

professional organizations—often prompting those groups to reissue and revise standards

and statements to include reference to the importance of the professional learning

community. The National Association of Elementary School Principals (2001) clarified

the essential responsibilities of principals in its publication, *Leading Learning

Communities: Standards for What Principals Should Know and Be Able to Do,* in which

it states:

>   If adults don't learn then students won't learn either…The school operates as a
>
>   learning community that uses its own experience and knowledge, and that of
>
>   others, to improve the performance of students and teachers alike…They must be

a place where learning isn't isolated, where adults demonstrate they care about

kids but also about each other. In such places, learning takes place in groups. A

culture of shared responsibility is established, and everybody learns from one

another. (p. 5)

Elsewhere, the National Association of Secondary School Principals (NASSP) called

upon high schools to engage in an improvement process that would ensure success for

every high school student. In *Breaking Ranks II* (2004), the NASSP urged principals to

focus on the development of a professional learning community within each school as a

primary improvement strategy. In its *Breaking Ranks in the Middle* publication (2006),

the NASSP organized 30 recommendations for improving middle schools into three

general areas, the first of which called for "collaborative leadership and professional

learning communities" (p. 23).

Regardless of the insistences of these professional organizations, school leaders

have often been criticized for being prone to embrace school change initiatives like that

of the professional learning community "at the drop of a hat" (Elmore, 2002, p. 5),

without actually learning how to improve. DuFour, Eaker, and DuFour (2008) claimed

that successful school leaders recognized that creating an effective professional learning

community transcends the assignment of people to teams, requiring substantive changes

in the culture of the school.

Marzano, Waters, and McNulty (2005) identified seven leadership responsibilities

crucial to affecting the sort of cultural changes the establishment of a high-functioning

professional learning community necessitates.

1. school leaders had a thorough knowledge of curriculum, instruction, and assessment;

2. school leaders had established supportive conditions that will inspire others to actively participate in the work of collaborative teams;

3. school leaders stimulated the intellectual curiosity of faculty and staff members regarding the framework and philosophies of professional learning communities and have ensured that they have a plan for enhancing their own understanding of the precepts;

4. school leaders served as a change agent by inspiring and encouraging faculty and staff to become involved, assumed some level of risk, stretched professional competence, and performed at a high level;

5. school leaders monitored how collaborative teams are functioning, assessed the degree of trust that is present among team members, and developed a specific plan for collecting data to share on a regular basis;

6. school leaders demonstrated flexibility and adopted a situational and collaborative leadership style; and

7. school leaders consistently communicated a personal belief that learning for all students is the purpose of schooling.

Wells and Feun (2007) insisted that administrators and school officials who led the complex change needed "theoretical understandings of the change process along with a broad-based knowledge of the conceptual framework of the model being studied for implementation" (p. 145). The authors maintained that the work of the learning

community required a special set of leadership skills and a substantial depth of

knowledge about the practices that translated into gains in student achievement.

Impediments to the Development of a School-Based Learning Community

According to Wells and Feun (2007), efforts to identify and document schools

that were functioning successfully as professional learning communities prove that the

transformation has been an incredible challenge. Research conducted by McLaughlin and

Talbert (2001) found that only three out of 16 high schools investigated in Michigan and

California functioned as learning communities. Similarly, the Southwest Regional

Educational Development Laboratory searched for schools that had successfully become

learning communities. The team of researchers utilized a set of key indicators to identify

schools that were learning communities; they indicated that "after considerable searching,

we did find five PLCs" (Cowen, Fleming, Thompson, and Morrissey, 2004, p. 15).

Rosenholtz (1991) maintained that teachers "shape their beliefs and actions

largely in conformance with the structures, policies, and traditions of the workaday world

around them" (p. 3). Although collaboration has been commonly recognized as an

integral element of both restructured schools and a professional learning community,

teachers have continued to work largely in professional isolation. Correspondingly, Barth

(2001) questioned, "I wonder how many children's lives might be saved if we educators

disclosed what we know to each other?" (p. 60). DuFour and Burnette (2002) contended

that schools have traditionally allowed the "weeds of professional isolation to run

rampant," and that "teachers decide what to do based on their own knowledge of content,

instruction, assessment, and classroom management." The authors maintained that this

isolation was attributable to time constraints, incompatible schedules, personal routines,

and deeply rooted traditions. Most teachers had wanted to be treated as autonomous professionals, and had been thereby reluctant to become involved with their colleagues' teaching and students (Newmann, 1994). Elsewhere, Fullan and Hargreaves (1996) argued that this professional reality "limits access to new ideas and better solutions, drives stress inward to fester and accumulate, fails to recognize and praise success, and permits incompetence to exist and persist to the detriment of students, colleagues, and the teachers themselves" (p. 5). McLaughlin and Talbert (2001) insisted that privacy norms and conditions of isolation in schools appeared to be self-perpetuating: when teachers felt that colleagues were not sharing resources and experiences, they became protective of their own resources and successes. When teachers did not share work, they tended to see their efforts in "proprietary terms" (p. 70). This phenomenon of isolation—attributable to both personal habit and physical limitation—had been long regarded as normal educational practice. Hord (2004) maintained that "many in the public and in the profession believe that the only legitimate use of a teacher's time is standing in front of the class, working directly with students" (p. 14).

A 1992 survey by the Center on Organization and Restructuring of Schools found that 46% of American high school teachers spend less than one hour a month meeting with colleagues on curriculum and instruction. The same survey concluded that another 30% of these faculty members spend between one and five hours per month in collaborative situations. Similarly, the Third International Mathematics and Science Study (TIMMS) found that, although approximately 50% of American middle schools have an official policy on collaboration, only 20%of math teachers in the United States observed another teacher during a typical school year, and less than 10% of math teachers

met with other teachers during a typical week (US Department of Education, 1996).

While Little (2006) insisted that a school is more likely to be effective in supporting high

levels of student learning and well-being when it also played a significant role in teacher

learning, few teachers have had regular access to intensive and effective learning

opportunities. In many school districts, professional development had been "episodic,

superficial, and disconnected from the problems of practice" (Little, 2006), and continued

to consist primarily of "one-shot workshops, rather than more effective problem-based

learning that is built into teachers' ongoing work with their colleagues" (Darling-

Hammond, 2005).

Schmoker (2006) insisted that this pervasive practice of teacher isolation is partly

responsible for the current state of American education. This status had been encouraged

by what had been referred to as an "injunction to respect the autonomy of teaching and

the mystery of its fundamental practices" (p. 24). Darling-Hammond (1996a) had

documented that in countries such as Japan, teachers have generally had the

responsibility of fewer classes, and have used a greater portion of their time in planning,

conferring with colleagues, working with students individually, visiting other classrooms,

and engaging in other professional development activities than their American

counterparts. Schmoker (2006) pointed to the prevalence of a "sentimental notion…that

teachers, left to themselves, will automatically and consistently engage in effective

practices" (p. 23). The author argued that this isolation ensured that highly unprofessional

practices were tolerated and therefore proliferated in the name of professionalism.

Haycock (2005) found that, when instructional choices were left to individual teachers

working alone, inferior practices dominated most American schools.

Few educators have publicly asserted that working in isolation is the best strategy for improving schools. Fullan (1991) argued that releasing teachers from this isolation could be regarded as not only a beneficial move for teacher collegiality, but also an essential prerequisite to securing educational change in any enduring sense. Elsewhere, Fullan insisted that this collegiality must be "linked to…continuous improvement and experimentation in which teachers are constantly seeking and assessing potentially better practices inside and outside their own school, and commitment to improving student engagement and learning must be a pervasive value and concern" (1990, p. 18). Both Marzano (2003) and Fullan and Hargreaves (1996) warned, however, that collegiality cannot be *contrived* by requiring teachers to plan together, consult together, or engage in peer coaching. Providing opportunities for teachers to meet has not guaranteed a culture of collaboration. DuFour and Eaker (2002) believed that faculty teams must define member responsibilities and expectations, specific parameters, clear priorities, and specific tasks to accomplish. Collegiality, therefore, was characterized by authentic interactions that were professional in nature. Fullan and Hargreaves insisted that these behaviors included: (a) open sharing of failures and mistakes, (b) demonstration of respect for one another, and (c) constructive analysis and criticism of practice and procedures. According to Hord (2004), "the widespread development of PLCs cannot occur…without a paradigm shift, among the public, and among educators themselves about what the role of the teacher entails."

Achievement Outcomes in Elementary School-Based Learning Communities

In settings where this paradigm shift was embraced by staff members and embedded in the culture of the school, improved student achievement was often

documented. In 2006, California-based EdSource published a report detailing the practices and policies associated with higher levels of student performance. The research—a large-scale survey of California elementary schools serving low-income students—suggested that effective schools encourage teacher collaboration, and provide support for site-level planning related to improving achievement (EdSource, 2006).

Similar results were gleaned from case studies describing the efficacy of teacher collaboration in individual schools. In 1995, when average proficiency rates for young readers was below the state average, the Kimberly Area School District in Kimberly, Wisconsin published a strategic plan that included the following goal for the 2002-2003 academic year: 90% of third-grade students would be proficient or advanced readers as assessed by the Wisconsin Reading Comprehension Test (WRCT). To achieve this goal, Kimberly initiated ongoing collaborative learning teams in which teachers regularly worked together to share strategies and examine student data. For the seven years that followed, Kimberly students recorded gains in reading proficiency—eventually reaching 93% in 2003. As a result, the district was listed as first among Wisconsin schools in improvement (O'Neill and Conzemius, 2006).

Other elementary schools met with similar successes upon implementing components of the professional learning community framework. During the 1990s, Burleigh Elementary school was designated the lowest performing school in its district, with 20% of its students performing below grade level. In 2001, Burleigh implemented policies permitting weekly collaboration time for grade-level teams. Four years later, 90 to 96% of students demonstrated proficiency in reading, language arts, and mathematics.

Reading proficiency for special education students rose from 39% to 63%, and

mathematics proficiency rose from 18 to 49% (O'Neill and Conzemius, 2006).

In 2003, South Elementary School in Eldon, Missouri made the purposeful

decision to enact the professional learning community model. Implementation of the PLC

framework began with the 2003-2004 academic year. Noted achievement increases in

that student population included a 24.1% gain in advanced and proficient on Missouri

Assessment Program (MAP) scores for communication arts between 2001 and 2005, and

a 12.2% increase between 2002 and 2007 in the number of first-grade students scoring at

grade level on the Developmental Reading Assessment (DRA) end-of-year test (Rentfro,

2007).

Moreno Elementary School experienced similar gains in student proficiency. In

2004, the California school—with 75% of its 650 students eligible for free or reduced-

priced lunches—committed to reorganizing itself into a professional learning community.

Moreno's Curriculum Leadership Team—with support from the district and central office

staff—participated in formal training events intended to assure effective implementation

of the professional learning community structure. Subsequently, teachers began to meet

weekly in grade level teams to collaboratively monitor student assessment results—

including reading, mathematics, and writing—for the purpose of improving the learning

of all students. By 2007, the school documented a 22% gain in the reading proficiency of

its students, and mathematics proficiency had increased by 31%. Additionally, Moreno

Elementary was awarded the 2007 Honor Roll Star School as one of only 126 schools in

California to have demonstrated a significant increase in grade-level proficiency and

achievement gap reduction over four years for all subgroups of its student population (Jones, 2007).

In a related three-year study, Strahan (2003) examined the dynamics of school culture in three elementary schools that had significantly improved low-income and minority student achievement. An analysis of 79 interviews indicated that personnel at these schools reported developing supportive cultures that enabled participants to coordinate efforts to improve instruction and strengthen professional learning communities. According to Strahan, the central dynamic in this development was "data-directed dialogue, [and] purposeful conversations, guided by formal assessment and informal observation" (p. 127). The result of these efforts at each of the three schools was an increase in student proficiencies on state achievement tests from less than 50% to more than 75%.

Results from research conducted by Hollins et al. (2004) also documented improvement in the achievement of elementary students enrolled in schools functioning as professional learning communities. In that analysis, researchers report that at both levels assessed (second and third grade), struggling African-American students in the target PLC schools increased their achievement significantly more than comparable students in the district. As an example, Hollins et al. stated:

> In 1998, 45 percent of second graders [at the target school] scored above the 25th percentile as compared with 64 percent in 1999, and 73 percent in 2000. This is a 28 percent overall gain. District-wide, 48 percent of second graders scored above the 25th percentile in 1998, 61 percent in 1999, and 56 percent in 2000, an overall gain of 12 percent. (p. 259)

Similar gains were reported for third grade students. Additionally, the number of students progressing into the 50th percentile or higher in target schools exceeded district gains at both grade levels.

<center>Achievement Outcomes in Middle School-Based Learning Communities</center>

Similar successes were experienced by middle schools that have implemented the sort of collaborative structures implicit in the professional learning community model. In 2003, Ignacio Intermediate School was in receipt of a state report card that indicated significant decline in student performance. In response to this diagnosis, school officials began providing weekly opportunities for staff members to collectively review student progress and identify strategies for improving achievement. In 2006, the school was notified that student achievement had risen on all Colorado state assessments, and its progress had nullified its previous deficits (Mid-Continent Research for Education and Learning, 2006).

In a similar investigation, a 1993 administration of the Iowa Test of Basic Skills (ITBS) revealed that students at Jenifer Junior High School in Lewiston, Idaho had registered reading scores at the 45th percentile, language scores at the 51st percentile, and mathematics scores at the 46th percentile. In an effort to increase achievement, administrators arranged for job-embedded collaborative time for teachers. By 1999, reading scores had risen to the 67th percentile, language had improved to the 59th percentile, and mathematics had increased to the 60th percentile. At the close of the 2004-2005 school year, 89% of all students were proficient in reading, 80% were proficient in language, and 78% were proficient in mathematics. In the same year, Jenifer

Junior High was recognized as both a Merit School and a School of Excellence (O'Neill and Conzemius, 2006).

In 2005, Overland Trail Middle School began implementation of the Professional Learning Community School Improvement Model with hopes of improving student achievement on the Kansas State Assessments. Faculty and staff devised strategies for sustained intervention and differentiated instruction in an effort to promote student learning and ensure success. In the two years that followed the implementation of the initiative, math proficiency scores documented a 10% increase and reading proficiency scores were bettered by 6%. In 2007, Overland Trail Middle School earned the Governor's Achievement Award for attaining scores that placed the building in the top 5% of the state.

In a related case study documenting the efforts of a middle school faculty engaged in learning community efforts to target low and underachieving students, Phillips (2003) reported that achievement scores increased dramatically over a three-year period. More specifically, ratings on the state-wide standardized test went from acceptable in 1999-2000 with 50% of the students passing subject area tests in reading, writing, math, science, and social studies, to exemplary in 2001-2002 with over 90% of the students passing each subject area test.

Achievement Outcomes in High School-Based Learning Communities

Despite a research-documented impediment to teacher collaboration in American high schools, institutions that *have* encouraged that element of the professional learning community have experienced gains in student achievement. In an examination of seven public high schools, the Education Trust identified the practices of "high impact"

institutions—those schools that produced unusually large growth among students who entered significantly behind. The research team, through on-site interviews and survey instruments, concluded that teachers in these achieving schools had regular, allocated time during which instructional strategies were discussed and refined (Education Trust, 2005).

According to Gideon (2002), collaborative structures were responsible for improved student performance at David Crockett High School in Austin, Texas. Collegial efforts were organized by grade-level teams, departmental teams, and learning communities. Within six years of implementation, student achievement in mathematics rose 26%, and the reading proficiency of African-American students rose nearly 40%. Ninth-grade retention was reduced from 42% in 1996 to 80% in 2002, and enrollment in Advanced Placement and honors classes increased for all student populations. Crocket High School was recognized as a Texas Successful School in 2001 for "greater achievement on the state accountability measure than comparable schools" (p 32).

In another investigation, Schmoker (2004) recounted the achievement gains of mathematics students. Within a year of teachers meeting regularly to analyze assessment results and make instructional adjustments, the percentage of Johnson City students passing the New York Regents Examination in mathematics rose from 47% to 93%. Similarly, student success rate on Advanced Placement exams rose 800% in the years that followed the implementation of purposed teacher collaboration at Adlai Stevenson High School in Lincolnshire, Illinois. Hord (1997) reported that, in high schools where staff were engaged together in collaborative learning communities, student results included: (a) increased persistence to graduation, (b) lower rates of absenteeism, (c) increased

learning that was distributed more equitably in smaller high schools, (d) greater academic gains in math, science, history, and reading than in traditional schools; and (e) and smaller achievement gaps between students from different backgrounds.

<div align="center">Benefits to Teachers as Members of Learning Communities</div>

DuFour and Eaker (1998) endorsed the professional learning community as "the most promising strategy for sustained, substantial school improvement" (p. 8). Similarly, Conzemius and O'Neill (2001) maintained that the purposeful embedding of professional learning community principles within the culture of the school provided the tools necessary for educators to develop and sustain strategies for improving curriculum and instruction in a cycle of continuous improvement. Empirical improvements, however, were not the sole benefits relatable to the PLC framework. Morrissey (2000) insisted that staff members that were part of a professional learning community "value and appreciate their direct involvement in increasing student learning and improving their school" (p. 24). According to Kruse, Louis, and Bryk (1994), school-based professional communities provided teachers with support and motivation necessary to overcome many encountered obstacles. Based on their findings, the researchers suggested that human resources—such as openness to improvement, trust and respect, teachers having knowledge and skills, supportive leadership, and socialization—were more critical to the development of professional learning communities than structural conditions. The authors concluded that effective professional learning communities were operational when teachers regularly demonstrated (a) reflective dialogue, (b) de-privatization of practices, (c) collective focus on student learning, (d) collaboration, and (e) shared norms and values (p. 4).

According to site-based research conducted by McLaughlin and Talbert (2001), the professional lives of teachers in professional learning communities "depart radically from schools and departments with traditional or weak communities" (p. 75). The authors contended that professional learning communities were typically collaborative and inclusive, and that teachers derived professional rewards from collegial interactions and from their sense of collective success with students in the school. The researchers indicated that teachers in learning communities commonly experienced careers marked by shared accomplishment and a sense of continuing professional growth. Teachers often assumed a cooperative standpoint on the issue of teaching expertise, viewing one another as resources for their improved practice with students in all classes. Hord (2004) maintained that educators did not relinquish individual style nor decrease personal responsibility. Rather, they were affirmed in their individuality and the contribution they made to the overall creativity to the group. Teachers who were members of effective professional learning communities often communicated a heightened willingness to work when they perceived their colleagues "actively pursuing a common goal" (p. 29). McLaughlin and Talbert insisted that:

> What distinguishes teacher learning communities from other school settings is their collective stance on learning in the context of shared work and responsibilities. In such communities, teachers together address the challenges of their student body and explore ways of improving practice to advance learning. This collective inquiry generates knowledge *of* practice, while a teacher's individual learning in strong traditional communities draws upon knowledge *for* practice, derived from research and theory outside the teaching setting. (p. 63)

Fullan and Hargreaves (1996) similarly maintained that the collaborative culture implicit in the principles of the professional learning community "respects, celebrates, and makes allowances for the teacher as a *person*" (p. 49). Staff members were more likely to reveal some of the personal side of themselves and feel comfortable voicing vulnerabilities. Teachers willingly invested energy into their relationships with each other—an activity that was often linked with the development of professional trust (Hord, 2004). More allowances were made for personal circumstances, illness, bereavements and bad days. Fullan and Hargreaves contended that "the person is not consumed by the group, but fulfilled through it," (p. 49) and that diversity among participants was both appreciated and accessible. Moreover, teachers who felt supported in their own learning and classroom practices became more committed and effective than those who did not. The sort of professional networks and collegial support endorsed within the framework of the learning community developed higher senses of teacher self-efficacy and an enhanced willingness to adopt new classroom behaviors (Rosenholtz, 1989). McLaughlin and Talbert (1993) also concluded that when collaboration among teachers was nurtured to enhance group learning, a shared vision was regularly established.

Author Mike Schmoker (2004) referred to the practice of "teachers teaching one another the practice of teaching" as a "simple effort" (p. 430). Yet the researcher claimed that the practice—so heavily interwoven within the framework of the professional learning community—has lead to one of the most salient lists of benefits to teachers in educational literature, including:

1. higher-quality solutions to instructional problems

2. increased confidence among faculty

3. increased ability to support one another's strengths and to accommodate
   weaknesses

4. more systematic assistance to beginning teachers, and

5. the ability to examine an expanded pool of ideas, methods, and materials.

According to Schmoker, these elements in combination could not have helped but to

produce "remarkable gains in [student] achievement" (p. 431).

In a 2004 summarizing report, *Professional Learning Communities: Communities

of Continuous Inquiry and Improvement*, professor emeritus Shirley Hord documented

the improved outcomes experienced by teachers in schools that were re-organized as

professional learning communities. These researched outcomes included:

1. reducedisolation of teachers;

2. increased commitment to the mission and goals of the school;

3. shared responsibility for the total development of students and the collective
   responsibility for students' success;

4. powerful learning that characterized effective teaching and classroom practice and
   created new beliefs about teaching and learning;

5. increased meaning and understanding of the subject area taught and the role of the
   teacher in assisting all students achieve hoped-for expectations;

6. higher likelihood that teachers would be knowledgeable, professionally
   invigorated, and inspired to motivate students;

7. higher career satisfaction and staff morale, and lower rates of absenteeism;

8. advances into making instructional modifications for students;

9. stronger pledge to making significant and lasting professional change; and

10. higher likelihood of having assumed a commitment to fundamental, systemic

    change.

Summary

While the reviewed literature suggested that teacher collaboration as defined

under the auspices of the professional learning community could have dramatic impact on

school improvement efforts, there has been a noticeable absence of published, empirical

research to support the notion that the framework promotes student success as it relates to

state performance measures. Indeed, a great deal of the writing about professional

learning communities has described the work of these structures and/or reports teachers'

perceptions of the value of this work (Vescio et al., 2008). Although teachers'

perceptions about the significance of professional learning communities have been both

valid and valuable, understanding the outcomes of these endeavors on teaching practice

and student learning is crucial—particularly in today's era of scant resources and

accountability.

Elsewhere, data has been collected to reinforce the importance of a shared

mission and intentional collaboration as it relates to student achievement, but much of

this work has been site-specific—focused on the practices of individual schools and the

outcomes of those implementations— rather than purposed to establish a relationship in

the general population. Improved and increased student proficiency on prescribed

assessments is both a state- and federally-mandated reality; and in an era of scarce

resources and heightened accountability, those practices that foster and encourage

enhanced student achievement on a wide-scale basis must be identified and implemented

if such a reality is to be achieved. It is the educational leader who bears the tremendous

responsibility of seeking out those research-supported initiatives that promise to improve schools by meeting the unique educational needs of the students within.

The quantitative nature of the study was responsive to these realities and to recent federal initiatives—including the No Child Left Behind Act and the Education Sciences Reform Act—that focus on the need for education policy and practices to be "based on scientific evidence" (Ary et al., 2006, p. 19). Elsewhere Vescio et al (2008) maintained that, in building the case that professional learning communities are powerful types of reform, the empirical analysis of data related to student achievement is essential. The methodology employed by the research described herein purposed to determine if any statistically significant relationship between student achievement and school participation as a professional learning community (as defined by participation in the state-sponsored project) existed. This causal comparative study primarily utilized correlational statistics and regression analyses to make this inference. According to Ary et al. (2006), multiple regression allows researchers to isolate the "best possible weighting of two or more independent variables to yield a maximum correlation with a single dependent variable" (p. 387). This application allowed for the potential analysis of student achievement in PLC and NPLC schools in several contexts—including socioeconomic category, ethnicity, and special education status.

This study focused on two populations of high schools in the state of Missouri: those that were participants in the state's Professional Learning Communities Project and those that were not participants in the state's Professional Learning Communities Project. Both school populations were arranged in a typical ninth through twelfth grade configuration.

The means and standard deviations for 2006 and 2007 eleventh grade communication arts Missouri Assessment Program (MAP) scores and tenth grade mathematics MAP scores were calculated for both populations of high schools. 2006 and 2007 Missouri Assessment Program (MAP) historical data for each student was obtained via the archives of the Office of Social and Economic Data Analysis (OSEDA) at the University of Missouri-Columbia. Using this retrieved database, a model was organized with the following variables: MAP scale score, type of school (PLC or NPLC), IEP status, free/reduced lunch status, and ethnicity. This study evaluated a null hypothesis relating student achievement and type of Missouri high school, PLC or NPLC, in four different contexts: (a) 2006 MAP Communication Arts, (b) 2007 MAP Communication Arts, (c) 2006 MAP Mathematics, and (d) 2007 MAP Mathematics. A significance level of .05 was used to accept or reject the null hypothesis.

CHAPTER THREE

METHODOLOGY

Chapter Three purposes to describe the following components of the methodology utilized in this study: research design, purpose of the study, research hypotheses, variables, site description, participants, instrumentation, data collection procedures, data analysis, and limitations.

Research Design

The decision of a school site to participate in the Missouri Professional Learning Communities Project could not be manipulated in the described investigation. As such, the research method employed herein was causal-comparative in design. To reduce threats to internal validity, all participants of the populations described herein were included in the proposed investigation.

Purpose of the Study

The purpose of this study was to suggest a response to the following research question: Is there a significant relationship between student achievement scores on the MAP and the type of Missouri high school attended, PLC or NPLC?

Educational leaders are ultimately accountable for student achievement. These achievement results are reported as components of Adequate Yearly Progress (AYP)—as required by the No Child Left Behind Act. If schools cannot demonstrate adequate yearly progress on state tests in mathematics and communication arts, they face interventions followed by increasingly severe sanctions. The No Child Left Behind Act also stipulates that students have the option of transferring to better-performing schools or receive

supplemental school services if their learning center does not demonstrate sufficient progress. Additionally, leaders must be attentive to the 14 performance standards of Missouri's Annual Performance Report (APR), which is directly related to state accreditation status and continued funding. Without question, school leaders must consider the implementation of any reform effort that promotes positive gains in student achievement.

Research Hypotheses

Null Hypothesis 1. There will be no significant relationship between the 2006 MAP Communication Arts achievement scores of eleventh grade students and the type of Missouri high school attended, PLC or NPLC.

Null Hypothesis 2. There will be no significant relationship between the 2007 MAP Communication Arts achievement scores of eleventh grade students and the type of Missouri high school attended, PLC or NPLC.

.   Null Hypothesis 3: There will be no significant relationship between the 2006 MAP Mathematics achievement scores of tenth grade students and the type of Missouri high school attended, PLC or NPLC.

Null Hypothesis 4: There will be no significant relationship between the 2007 MAP Mathematics achievement scores of tenth grade students and the type of Missouri high school attended, PLC or NPLC.

Variables

The independent variable in this study was the type of high school attended by each member of the studied population, either PLC or NPLC.

The dependent variable in this study was the 2006 and 2007 scale scores for tenth grade students in the area of Mathematics and of eleventh grade students in the area of Communication Arts, as measured by the Missouri Assessment Program (MAP) achievement test.

The controlled variables—or those factors that were kept constant so as to minimize their effects on the outcome of the investigation—were socioeconomic status (LUNCH), special education services (IEP), and ethnicity. Several researchers, including Beckar and Luthar (2002) and Reeves (2004), had documented the power of these demographic variables as predictors of student success. Thus, for the purposes of this investigation, these factors were considered "controlled" and were incorporated into the research design as described below.

Site Description

Schools were selected on the basis of grade configuration and elective participation in the Missouri Professional Learning Communities Project. According to the state's Division of School Improvement at the Department of Elementary and Secondary Education (2007b), the Professional Learning Communities Project functioned as "a comprehensive school improvement program that provides guidance to Missouri schools" in their efforts to:

1. focus on the fundamental purpose of schooling (learning),

2. develop a vision of their ideal school where all students learn,

3. commit to behaviors that will help reach the vision, and

4. set goals that are SMART (specific and strategic, measurable, achievable, results-oriented, and time-bound).

Participants in Missouri's Professional Learning Communities Project worked to focus school efforts on improving student achievement. School faculties worked in collaborative teams to continually ask and seek answers to the following four questions:

1. What should students know and be able to do?

2. How will faculty and staff know if students have learned?

3. What will faculty and staff do if students have not learned?

4. What will faculty and staff do if students have learned?

Working together, teachers responded to the first question by identifying and agreeing to teach a core curriculum aligned to state standards and valid measures, such as local, state, and national assessments. The collaborative teams of teachers focused on setting specific goals for student achievement and were provided with site-based information that helped to identify students who were not making progress. Professional Learning Communities monitored student learning continually and responded to students who were not learning by providing them with additional time and more support during the school day.

Project schools formed a team of teachers referred to as "coaches" who entered into a state-sponsored three-year training process focused on best practices to improve student achievement. The coaches then took the process back to their schools where they worked to initiate positive change by training their colleagues. The "train-the-trainer" format was sustained through shared resources and guidance from the staff of the Missouri Professional Learning Communities Project. The focus areas for these trainings varied with the state's nine Regional Professional Development Centers, but the conceptual framework adopted by DESE was state-directed and suggested the following themes for the monthly meetings of year-one participant schools:

1. laying the foundation and clarifying priorities, including an examination of a school's mission, vision, values and goals;

2. examining the current reality of the school, including data analysis and the establishing of school-wide goals;

3. forming collaborative teams, including the establishing of norms and protocols and the construction of a collaborative culture;

4. forming the leadership team, including effective communication and coordination within the learning community;

5. collaborative teams focused on results, including the analysis of student data, the clarification of essential learning targets, and the development of common formative and summative student assessments;

6. mid-year review of progress, including a benchmark evidence of progress toward goals;

7. refining the work of collaborative teams, including a focus on active student engagement and an examination of best instructional practices;

8. establishing a pyramid of interventions, including the construction of a response to students that is systematic, school-wide, and timely; and

9. end-of-year review and planning for year two of implementation, including a critical examination of barriers to progress and a sharing of successes from year one.

Year-two and three project participants met with DESE personnel on a quarterly basis and received ongoing training in the themes introduced during year one. Fourth-year and beyond project schools were provided with professional development activities

that were based on their particular needs and goals. The emphasis for these "mature" schools was on the assurance that the capacity to sustain the work of ongoing improvement had been embedded within the structure and culture of the school.

High schools that had not elected to participate in the Missouri Professional Learning Communities Project comprised the non-experimental group in the investigation. The Department of Elementary and Secondary Education provided no formal training or support to these individual schools. Consequently, the local policy and procedures of these schools, rather than formal PLC training and assistance, informed matters related to teacher collaboration, common assessment, data analysis, goal-setting, and intervention efforts.

<div align="center">Participants</div>

The population for this study consisted of all students enrolled in the public high school of Missouri with a typical ninth through twelfth grade configuration. Students in the tenth grade were assessed in the mathematics portion of the MAP test. Students in the eleventh grade were assessed in the communication arts portion of the MAP test.

<div align="center">Instrumentation</div>

The MAP achievement test was the instrument utilized to measure student achievement in the state of Missouri. The MAP test was a criterion-referenced and performance-based assessment based on the Show-Me Standards. Each MAP assessment required three to five hours of test administration time and included any of three types of test items: selected-response items, constructed-response items, and performance events (including writing prompts). The selected-response items presented students with a question followed by three or four response options. A subset of selected-response items

were extracted from the *Survey* edition of TerraNova™, a nationally-normed test

developed by CTB/McGraw-Hill. The constructed-response items required students to

supply (rather than select) an appropriate response. Students were asked to show their

work when answering questions. In addition to measuring students' content knowledge,

constructed-response items provided information about how students arrived at their

answers. The performance events used in Missouri's statewide assessment required

students to work through more complicated items. Performance events allowed for more

than one approach to arrive at a correct response. According to DESE (2008), "the

advantage of this type of assessment item is that it provides insight into a student's ability

to apply knowledge and understanding in real-life situations" (p. 1).

Student performance on the MAP was reported as a three-digit number that ranges

between 450 and 910 (referred to as a *scale score*) and was assigned to a corresponding

level on a continuum of proficiency: Below Basic, Basic, Proficient, and Advanced.

Additionally, the test battery satisfied the criteria for a state-issued assessment as directed

by the No Child Left Behind educational initiative of 2001.

Assurances for Instrument Validity

According to DESE, the validity or meaningfulness of MAP scores as indices of

proficiencies relative to the Show-Me Standards was ensured by using methodical and

rigorous test-development procedures. DESE also maintained that "content-related

validity can be demonstrated through consistent adherence to test blueprints, through a

high quality test development process" (Missouri Department of Elementary and

Secondary Education, 2007c, p. 8). MAP assessments were developed by CTB/McGraw-

Hill and DESE in accordance with accepted procedures and criteria, and were

intentionally aligned with specific Show-Me Standards measured at that grade and

subject area. For each assessment, content experts determined that the norm-referenced

items for that grade and subject matched the designated Standards. Groups of Missouri

educators then reviewed each item to produce an "item-to-Standard" congruence rating to

insure that each question sufficiently measured the content or process demanded by the

Standard. The item development for the 2006 and 2007 MAP achievement test was

described thusly:

> Planning and preparation for the development of item content to be used on the
>
> 2006 and 2007 Communication Arts and Mathematics MAP Operational Test
>
> forms commenced in late 2002. The plan specified an item development and
>
> selection cycle that included an initial item writing/passage selection workshop
>
> (Spring 2003), a local pilot study (Fall 2003), a content and bias review (Spring
>
> 2004), item refinements and form construction (Summer, Fall, Winter 2004),a
>
> subsequent round of formal field testing (Spring 2005), the selection of
>
> operational forms based on statistical data from the field test (Summer, Fall
>
> 2005), a formal standard-setting process (Winter 2005), and ultimately,
>
> operational testing (Spring 2006 and 2007) at Grade levels 3 through 8 and high
>
> school. (Missouri Department of Elementary and Secondary Education, 2007c,
>
> p. 8)

In an additional effort to assure for instrument validity, CTB/McGraw-Hill and

DESE routinely investigated the constructs measured by the MAP. These agencies

annually analyzed how performance on individual items related to performance on other

items and how performance on an individual item related to performance on the entire

assessment. These item-and score-pattern analyses conducted on MAP results were intended to evidence that each assessment was measuring the traits it was designed to measure and did not measure unrelated constructs. Evidence gleaned through a Principal Components Analysis for testing years 2006 and 2007 supported the claim that there was

> A dominant dimension underlying the items/tasks in each test and that scores from each test represent performance primarily determined by that ability. Construct-irrelevant factors such as factual knowledge irrelevant for doing well in a subject does not appear to significantly affect performance. (Missouri Department of Elementary and Secondary Education, 2007c, p. 68)

Lastly, DESE references a study of "consequential validity" as a third type of evidence supporting the meaningfulness of MAP results. This research, conducted by the Center for Learning, Evaluation, and Assessment Research at the University of Missouri-Columbia, explored the effects resulting from the implementation of MAP, focusing specifically on instructional practices in mathematics. Results indicated that teachers were becoming more convinced of the work of authentic learning activities and assessment methods. Additionally, researchers found that classroom teachers were revising grading practices as a result of the MAP, using more performance-based measures to determine student grades than in the past. (Missouri Department of Elementary and Secondary Education, 2007c)

Assurances for Instrument Reliability

In its 2007 MAP Technical Report, DESE conceptualized reliability as "the consistency of the students' test scores on parallel forms of the same test when they are administered under the same conditions" (Missouri Department of Elementary and

Secondary Education, 2007c, p. 65). The reliability of raw scores on MAP tests is annually evaluated using Cronbach's Alpha, which is a "lower-bound estimate of test reliability" (Missouri Department of Elementary and Secondary Education, 2007c, p. 65). The reliability coefficient is the ratio of the variance of true test scores to those of the observed scores, with the values ranging from 0 to 1. The closer the value of the reliability coefficient is to 1, the more consistent the scores, where 1.00 refers to a perfectly consistent test. According to DESE, reliability coefficients that were equal to or greater than 0.9 were considered acceptable for tests of lengths similar to the MAP. In 2006 and 2007, all reliability statistics were over .90 for all tests and assessed student subgroups, indicating acceptable reliability.

<div align="center">Data Collection Procedures</div>

2006 and 2007 Missouri Assessment Program (MAP) historical data for each student was obtained via the archives of the Office of Social and Economic Data Analysis (OSEDA) at the University of Missouri-Columbia, as were descriptive data related to factors of ethnicity, socio-economic status, and student participation in special school services. Participants in the Missouri Professional Learning Communities Project were identified from the website of the *School Improvement Initiatives* section of the Department of Elementary and Secondary Education. Using this retrieved database, a model was organized with the following variables:

1. MAP: The MAP scale score (either Communication Arts or Mathematics, respectively)

2. TYPE: PLC (coded "1") or NPLC (coded "0)

3. IEP: Serviced by an individual education plan; Yes (coded "1") or No (coded "0")

4. LUNCH: In receipt of free or reduced school meal programs; Yes (coded "1") or

    No (coded "0")

5. ETHNICITY: Native American or Alaska Native (coded "0"), Asian/Pacific

    Islander (coded "1"), Black (coded "3"), Hispanic (coded "4"), or White

    (coded "5")

Data Analysis

This study was designed as a non-experimental, correlational investigation. This

study evaluated a null hypothesis relating student achievement and type of Missouri high

school, PLC or NPLC, in four different contexts: (a) 2006 MAP Communication Arts, (b)

2007 MAP Communication Arts, (c) 2006 MAP Mathematics, and (d) 2007 MAP

Mathematics. A significance level of .05 was used to accept or reject the null hypothesis.

According to Gay and Airasian (2003), the first step in data analysis is to

describe, or summarize the data using descriptive statistics. Therefore, for each context

described above, the mean and standard deviation of the respective PLC and NPLC group

was determined. Using the Statistical Package for the Social Sciences (SPSS), the

Pearson Correlation Coefficient, obtained by dividing the covariance of the two variables

by the product of their standard deviations, was then calculated to determine the size and

direction of the relationship between the identified variables. This calculated coefficient

indicated the size and direction of the relationship and was represented as a decimal

number. A coefficient of +1.00 was accepted as representing a perfect positive

correlation, while a coefficient of -1.00 was accepted as having a perfect negative

correlation. A coefficient value that neared .00 indicated no relationship, and the further

away from .00 the coefficient was, in either direction, the stronger the relationship was

judged to be. In this study, the correlation coefficient was interpreted in terms of its statistical significance with $p = .05$.

Lastly, a model was specified where the independent variables described above were regressed on the dependent variable (2006 and 2007 MAP Communication Arts and Mathematics scale scores, depending on the context). Regression analyses are commonly used for the modeling of causal relationships like the one investigated in this study and are conducted to test variables believed to be predictors of a criterion (Gay and Airasian, 2003). The dataset for each null hypothesis, therefore, was analyzed using the multiple regression equation to determine if the type of Missouri high school (PLC or NPLC) was a statistically significant predictor of student achievement as measured by the MAP.

<div align="center">Limitations</div>

The following conditions and situational realities were recognized as limitations of the described investigation:

1. This study was limited to students and schools in the state of Missouri and is not necessarily applicable to students and schools in other states.

2. This study only involved high schools with a typical ninth through twelfth grade configuration.

3. This study only utilized performance data from two years of MAP tests.

4. This study was limited to one specific assessment instrument as a measure of student achievement. In this study the MAP achievement test was selected.

5. The MAP achievement test scores may be affected by the ability of the proctor to administer the assessment.

6. MAP achievement may be affected by extraneous factors that exist on the day(s)
    of testing.

7. This study focused only on student achievement differences between schools that
    participate in the Missouri PLC project and schools that do not participate in the
    Missouri PLC project.

8. This study defined a PLC school as such if it was reported to be a member of the
    Missouri PLC project. Levels of adherence, implementation, and/or involvement
    may vary among PLC project schools.

9. This study defined a PLC school as such if it is reported to be a member of the
    Missouri PLC project. NPLC schools, while not in receipt of state-supported
    training or sponsored designation, may adhere to and espouse many of the stated
    principles of the PLC framework.

CHAPTER FOUR

FINDINGS

Introduction

Literature related to school improvement is replete with references that beckon schools to become learning communities and organizations (Fullan, 2001; Hord, 1997; McLaughlin and Talbert, 2001; Talbert, 2001; Senge et. al, 2000). Learning communities are "places in which teachers pursue clear, shared purposes for student learning, engage in collaborative activities to achieve their purposes and take collective responsibility for student learning" (Sparks, 1999, para. 1). Professional learning communities provide a "vision for a different way of conducting business in the school—one that is collegial, professional, and results driven" (Wells and Feun, 2007, p. 142). McLaughlin and Talbert (2001) state that "Principles for professional development policy, practice, and initiative that come from nearly two decades of U.S. reform underscore our conclusion that teacher learning communities constitute the best context for professional growth and change" (p. 135). And DuFour, Eaker, and DuFour (2005) attest:

> The use of PLCs is the best, least expensive, most professionally rewarding way to improve schools. 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. 128)

The purpose of this study was to suggest a response to the following research question: Is there a significant relationship between student achievement scores on the MAP and the type of Missouri high school attended, PLC or NPLC?

Data Collection

The decision of a school site to participate in the Missouri Professional Learning Communities Project could not be manipulated in the proposed investigation. As such, the research method employed herein was causal-comparative in design. To reduce threats to internal validity, all participants of the populations described above were included in the investigation. Participants in the Missouri Professional Learning Communities Project were identified from the website of the *School Improvement Initiatives* section of the Department of Elementary and Secondary Education. Missouri Assessment Program (MAP) historical data for each school was obtained via the archives of the Office of Social and Economic Data Analysis (OSEDA) at the University of Missouri-Columbia. Additionally, descriptive data related to factors of ethnicity, socio-economic status, and student participation in special school services were included in the database provided by OSEDA. After statistical procedures were applied, alternative explanations for any outcomes, including common cause, reverse causality, and other possible variables, were examined.

Results

Null Hypothesis 1

Context 1: 2006 MAP Communication Arts

There will be no significant relationship between the 2006 MAP Communication Arts achievement scores of eleventh grade students and the type of Missouri high school attended, PLC or NPLC.

The first step in evaluating this context was to examine basic descriptive statistics for the 2006 MAP Communication Arts dataset. Table 1 presents a summary of the means and standard deviations for the PLC, NPLC, and TOTAL groups.

Table 1

2006 MAP Communication Arts Scores Descriptive Statistics

	Mean	Standard Deviation	N
PLC	717.79	31.14	11856
NPLC	717.07	31.06	36903
TOTAL	717.25	31.08	48759

The data presented in Table 1 supports the assertion that there was no relationship between PLC and NPLC schools in terms of an effect on MAP scores. The average 2006 MAP scale score in Communication Arts for the eleventh grade students who were enrolled in identified PLC schools was 717.79 and the corresponding standard deviation, or the measure of dispersion from the mean, was calculated to be 31.14. The average 2006 MAP scale score in Communication Arts for the eleventh grade students were enrolled in identified NPLC schools was 717.07 and the corresponding standard deviation was 31.06. The average 2006 MAP scale score in Communication Arts for the total eleventh grade researched population was 717.25 and the corresponding standard deviation was 31.08.

The idea that there was no relationship between student achievement and TYPE of Missouri high school attended was reinforced by an examination of Pearson's r results. Table 2 indicated that the strongest relationship or, in other words, the best predictor of MAP scores was IEP *(r=.43, p=.000).* At the same time, LUNCH *(r=.246, p=.000)* and ETHNICITY *(r=.205, p=.000)* had positive relationships to MAP as well. On the other hand, the variable of interest, TYPE: PLC or NPLC, had a very weak, almost zero relationship to MAP *(r=.010, p=.015).* Table 3 shows that all the correlations were statistically significant *(p<α .05)* which further supports the conclusion that TYPE had no substantively meaningful effect on student achievement as measured by MAP.

Table 2

2006 MAP Communication Arts Score Pearson Correlation Coefficient Values

	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	1.000	.010	.430	.246	.205
TYPE	.010	1.000	.017	.037	.011
IEP	.430	.017	1.000	.117	.046
LUNCH	.246	.037	.117	1.000	.253
ETHNICITY	.205	.011	.046	.253	1.000

Table 3

2006 MAP Communication Arts Score Pearson Correlation Significance Values

	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	-	.015	.000	.000	.000
TYPE	.015	-	.000	.000	.008
IEP	.000	.000	-	.000	.000
LUNCH	.000	.000	.000	-	.000
ETHNICTY	.000	.008	.000	.000	-

The third and final analysis of Null Hypothesis 1 was of the regression model described in the previous chapter. In this model the independent variables were regressed on the dependent variable, 2006 MAP Communication Arts scale scores. Table 4 presents a summary of the "goodness of fit" of the model as a whole. The adjusted R^2 of .243 means that approximately 25% of the variance in the model is explained by the specified independent variables; that is, there are other unspecified factors affecting 2006 MAP Communication Arts scale scores in the "real world"—accounting for 75% of the observed variation between observed and predicted values. In statistically generated education models like this one—given the complexity and holistic nature of the education process—this R^2 value suggests that the model has some merit (Snow et. al., 1998).

Table 4

2006 MAP Communication Arts Score Coefficient of Determination

R	R Square	Adjusted R Square	Standard Error of the Estimate
.493	.243	.243	27.03

Table 5 presents the results of the regression for each identified independent variable. Again, the conclusion that may be drawn from this data is that there is no statistically significant relationship between TYPE of Missouri high school, PLC or NPLC, and 2006 MAP Communication Arts scale scores, even after controlling for the IEP, LUNCH, and ETHNICITY variables.

Table 5

2006 MAP Communication Arts Score Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficents	_t_	Significance
	B	Standard Error	Beta		
(Constant)	650.499	.699	-	930.054	.000
TYPE	-.335	.286	-.005	-1.172	.241
IEP	40.152	.394	.404	101.889	.000
LUNCH	11.640	.294	.162	39.660	.000
ETHNICITY	4.893	.137	.145	35.697	.000

In summary, Null Hypothesis 1 was accepted because there was no significant relationship between the achievement of eleventh grade students and TYPE of Missouri high school attended, PLC or NPLC, based on performance on the 2006 MAP achievement test in Communication Arts.

Null Hypothesis 2

Context 2: 2007 MAP Communication Arts

There will be no significant relationship between the 2007 MAP Communication Arts achievement scores of eleventh grade students and the type of Missouri high school attended, PLC or NPLC.

The first step in evaluating this context was to examine basic descriptive statistics for the 2007 MAP Communication Arts dataset. Table 6 presents a summary of the means and standard deviations for the PLC, NPLC, and TOTAL groups.

Table 6

2007 MAP Communication Arts Scores Descriptive Statistics

	Mean	Standard Deviation	N
PLC	716.66	30.99	12684
NPLC	715.95	31.33	37683
TOTAL	716.12	31.23	50367

The average 2007 MAP scale score in Communication Arts for the eleventh grade students who were enrolled in identified PLC schools was 716.66 and the corresponding standard deviation was calculated to be 30.99. The average 2007 MAP scale score in

Communication Arts for the eleventh grade students were enrolled in identified NPLC schools was 715.95 and the corresponding standard deviation was 31.33. The average 2007 MAP scale score in Communication Arts for the total eleventh grade researched population was 716.12 and the corresponding standard deviation was 31.23.

The notion that there was no significant relationship between student achievement on the 2007 MAP Communication Arts assessment and type of Missouri high school attended was reinforced by an examination of Pearson's *r* results. Table 7 once again concluded that the best predictor of MAP scores was the IEP status of a student. Concurrently, LUNCH and ETHNICITY had positive and statistically significant relationships to MAP as well. On the other hand, the relationship of the variable of interest, TYPE: PLC or NPLC, had a very ineffectual, almost zero relationship to MAP ($r=.010$, $p=.013$). Table 8 shows that all correlations were statistically significant ($p<\alpha$ .05) which further supports the conclusion that TYPE had no substantively meaningful effect on student achievement.

Table 7

2007 MAP Communication Arts Score Pearson Correlation Coefficient Values

	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	1.000	.010	.446	.256	.185
TYPE	.010	1.000	.011	.030	.009
IEP	.446	.011	1.000	.119	.032
LUNCH	.256	.030	.119	1.000	.262
ETHNICITY	.185	.009	.032	.262	1.000

Table 8

2007 MAP Communication Arts Score Pearson Correlation Significance Values

	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	-	.013	.000	.000	.000
TYPE	.013	-	.005	.000	.018
IEP	.000	.005	-	.000	.000
LUNCH	.000	.000	.000	-	.000
ETHNICTY	.000	.018	.000	.000	-

The third and final analysis of the dataset specified for null hypothesis 2 was of the regression model described in the previous chapter. In this model, the independent variables were regressed on the dependent variable, 2007 MAP Communication Arts scale scores. Table 9 presents a summary of the "goodness of fit" of the model as a whole. The adjusted R^2 of .256 means that approximately 26% of the variance in the model is explained by the specified independent variables; that is, there are other, unspecified factors affecting 2007 MAP Communication Arts scale scores in the "real world"—accounting for 74% of the observed variation between observed and predicted values.

Table 9

2007 MAP Communication Arts Score Coefficient of Determination

R	R Square	Adjusted R Square	Standard Error of the Estimate
.506	.256	.256	26.95

Table 10 presents the results of the regression for each identified independent variable. Again, the conclusion that may be drawn from this data is that there was no statistically significant relationship between 2007 MAP Communication Arts student scale scores and type of Missouri high school attended, PLC or NPLC, even after controlling for the IEP, LUNCH, and ETHNICITY variables.

Table 10

2007 MAP Communication Arts Score Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficents	t	Significance
	B	Standard Error	Beta		
(Constant)	650.908	.682	-	953.882	.000
TYPE	-8.679E-02	.277	-.001	-.314	.754
IEP	41.690	.383	.422	108.892	.000
LUNCH	12.226	.284	.173	43.093	.000
ETHNICITY	4.224	.134	.126	31.600	.000

In summary, Null Hypothesis 2 was accepted because there was no significant relationship between the achievement of eleventh grade students on the 2007 MAP achievement test in Communication Arts and TYPE of Missouri high school, PLC or NPLC.

Null Hypothesis 3

Context 3: 2006 MAP Mathematics

There will be no significant relationship between the 2006 MAP Mathematics achievement scores of tenth grade students and the type of Missouri high school attended, PLC or NPLC.

The first step in evaluating this third context was to examine basic descriptive statistics for the 2006 MAP Mathematics dataset. Table 11 presents a summary of the means and standard deviations for the PLC, NPLC, and TOTAL groups.

Table 11

2006 MAP Mathematics Scores Descriptive Statistics

	Mean	Standard Deviation	N
PLC	734.28	47.11	10695
NPLC	722.75	51.25	44701
TOTAL	724.97	50.69	55396

The average 2006 MAP scale score in Mathematics for the tenth grade students who were enrolled in identified PLC schools was 734.28 and the corresponding standard deviation was calculated to be 47.11. The average 2006 MAP scale score in Mathematics for the tenth grade students enrolled in identified NPLC schools was 722.75 and the corresponding standard deviation was 51.25. This difference in calculated means—while not statistically significant—is notable, as it represents the widest variation in average MAP scale scores among the four defined contexts. The average 2006 MAP scale score in Mathematics for the total tenth grade researched population was 724.97 and the corresponding standard deviation was 50.69.

The suggestion that there was no relationship between student performance on the 2006 MAP Mathematics assessment and TYPE of Missouri high school attended was reinforced by an examination of Pearson's r results. Table 12 once again concluded that the best predictor of MAP scores was the IEP status of a student. At the same time, LUNCH and ETHNICITY had positive correlational relationships to MAP as well. Contrarily, the variable of interest; TYPE: PLC or NPLC had a very weak, almost zero relationship to MAP ($r=.009$, $p=.016$). Table 13 indicates that all the correlations are statistically significant ($p<\alpha$ .05) which further supports the conclusion that TYPE had no substantively meaningful effect on student achievement as measured by the 2006 MAP Mathematics achievement test.

Table 12

2006 MAP Mathematics Score Pearson Correlation Coefficient Values

_____

	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	1.000	.009	.426	.292	.260
TYPE	.009	1.000	.015	.033	.012
IEP	.426	.015	1.000	.123	.043
LUNCH	.292	.033	.123	1.000	.264
ETHNICITY	.260	.012	.043	.264	1.000

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Table 13

2006 MAP Mathematics Score Pearson Correlation Significance Values

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	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	-	.016	.000	.000	.000
TYPE	.016	-	.000	.000	.003
IEP	.000	.000	-	.000	.000
LUNCH	.000	.000	.000	-	.000
ETHNICTY	.000	.003	.000	.000	-

_____

The third and final analysis of the dataset specified for null hypothesis 3 was of

the regression model described in the previous chapter. Once again, the independent

variables were regressed on the dependent variable, 2006 MAP Mathematics scale scores.

Table 14 presents a summary of the "goodness of fit" of the model as a whole. The

adjusted R^2 of .274 means that approximately 28% of the variance in the model is

explained by the specified independent variables; that is, there exist other, unspecified

factors affecting 2006 MAP Mathematics scale scores in actuality—accounting for 72%

of the observed variation between observed and predicted values.

Table 14

2006 MAP Mathematics Score Coefficient of Determination

R	R Square	Adjusted R Square	Standard Error of the Estimate
.524	.274	.274	43.18

Table 15 presents the results of the regression for each identified independent

variable. Again, the conclusion that may be drawn from this data is that there was no

statistically significant relationship between 2006 MAP mathematics student scale scores

and TYPE of Missouri high school attended, PLC or NPLC, even after controlling for the

IEP, LUNCH, and ETHNICITY variables.

Table 15

2006 MAP Mathematics Score Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficents	t	Significance
	B	Standard Error	Beta		
(Constant)	610.009	1.023	-	596.537	.000
TYPE	-.637	.427	-.005	-1.493	.135
IEP	60.040	.555	.394	108.135	.000
LUNCH	21.361	.419	.193	51.022	.000
ETHNICITY	10.491	.205	.192	51.196	.000

In summary, Null Hypothesis 3 was accepted because there was no significant relationship between the achievement of tenth grade students on the 2006 MAP achievement test in Mathematics and TYPE of Missouri high school attended, PLC or NPLC.

Null Hypothesis 4

Context 4: 2007 MAP Mathematics

There will be no significant relationship between the 2007 MAP Mathematics achievement scores of tenth grade students and the type of Missouri high school attended, PLC or NPLC.

The initial step in analyzing this fourth context was to examine basic descriptive statistics for the 2007 MAP Mathematics dataset. Table 16 presents a summary of the

means and standard deviations for the PLC, NPLC, and TOTAL groups.

Table 16

2007 MAP Mathematics Scores Descriptive Statistics

	Mean	Standard Deviation	N
PLC	725.27	47.38	13753
NPLC	723.12	47.79	42510
TOTAL	723.65	47.70	56263

The average 2007 MAP scale score in Mathematics for the tenth grade students who were enrolled in identified PLC schools was 725.27 and the corresponding standard deviation was calculated to be 47.38. The average 2007 MAP scale score in Mathematics for tenth grade students who were enrolled in identified NPLC schools was 723.12 and the corresponding standard deviation was 47.79. The average 2007 MAP scale score in Mathematics for the total tenth grade researched population was 723.65 and the corresponding standard deviation was 47.70.

The idea that there was no relationship between student achievement and TYPE of Missouri high school attended, PLC or NPLC, was reinforced by an examination of Pearson's r results. Table 17 indicated that the strongest relationship or, in other words, the best predictor of MAP scores was IEP *(r=.424, p=.000)*. At the same time, LUNCH *(r=.281, p=.000)* and ETHNICITY *(r=.253, p=.000)* have positive relationships to MAP as well. Alternately, the variable of interest, TYPE: PLC or NPLC, had a very weak

relationship to MAP *(r=.019, p=.000)*. Table 3 shows that all of the correlations are

statistically significant *(p<α .05)*.

Table 17

2007 MAP Mathematics Score Pearson Correlation Coefficient Values

	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	1.000	.019	.424	.281	.253
TYPE	.019	1.000	.015	.027	.000
IEP	.424	.015	1.000	.113	.040
LUNCH	.281	.027	.113	1.000	.255
ETHNICITY	.253	.000	.040	.255	1.000

Table 18

2007 MAP Mathematics Score Pearson Correlation Significance Values

	MAP	TYPE	IEP	LUNCH	ETHNICITY
MAP	-	.000	.000	.000	.000
TYPE	.000	-	.000	.000	.469
IEP	.000	.000	-	.000	.000
LUNCH	.000	.000	.000	-	.000
ETHNICTY	.000	.469	.000	.000	-

The third and final analysis of the dataset specified for null hypothesis 4 was of

the regression model described in the previous chapter. Once again, the independent

variables were regressed on the dependent variable, 2007 MAP Mathematics scale scores.

Table 19 presents a summary of the "goodness of fit" of the model as a whole. The

adjusted R^2 of .268 means that approximately 27% of the variance in the model is

explained by the specified independent variables; that is, there are other, unspecified

factors affecting 2007 MAP Mathematics scale scores in the "real world"—accounting

for 73% of the observed variation between observed and predicted values.

Table 19

2007 MAP Mathematics Score Coefficient of Determination

R	R Square	Adjusted R Square	Standard Error of the Estimate
.518	.268	.268	40.80

Table 20 displays the regression coefficients for each independent variable

identified in the research model. The results suggest that TYPE (PLC or NPLC) accounts

for a difference of .958 scale score points in 2007 tenth grade Mathematics MAP scores

after controlling for the variables of IEP, LUNCH, and ETHNICITY. In other words,

students in PLC schools would have been predicted to have achieved, on average, a scale

score of less than a single point more than their peers in a NPLC school. Thus, while the

coefficient is statistically significant ($p=.017<\alpha=.05$), the practical effect is almost nil.

Table 20

2007 MAP Mathematics Score Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Significance
	B	Standard Error	Beta		
(Constant)	617.097	.945	-	652.947	.000
TYPE	.958	.400	.009	2.392	.017
IEP	56.765	.522	.395	108.782	.000
LUNCH	19.404	.388	.188	50.053	.000
ETHNICITY	9.567	.188	.189	50.796	.000

In summary, Null Hypothesis 4 was rejected because there was a statistically significant relationship between student performance on the 2007 MAP achievement test in Mathematics and TYPE of Missouri high school attended as determined by the regression analysis. There was little substantive difference, however, in the results.

Summary

This chapter presented the statistical findings of this causal-comparative, non-experimental study. The examined population consisted of all students enrolled in the public high school of Missouri with a typical ninth through twelfth grade configuration. Students in the tenth grade were assessed in the mathematics portion of the MAP test. Students in the eleventh grade were assessed in the communication arts portion of the MAP test. 2006 and 2007 MAP historical data for each student was obtained via the archives of the Office of Social and Economic Data Analysis (OSEDA) at the University

of Missouri-Columbia, as were descriptive data related to factors of ethnicity, socio-economic status, and student participation in special school services. Participants in the Missouri Professional Learning Communities Project were identified from the website of the *School Improvement Initiatives* section of the Department of Elementary and Secondary Education.

The data from this study was statistically analyzed using descriptive statistics, the Pearson Product Correlation, and simple linear regression. The results of the data analysis related to each hypothesis and context were reported. Null Hypothesis 1, Null Hypothesis 2, and Null Hypothesis 3 were accepted. It was not possible, however, to accept Null Hypothesis 4.

It was determined that there was no statistically significant relationship between student achievement and type of Missouri high school attended, PLC or NPLC, in three of the four contexts analyzed: (a) 2006 MAP Communication Arts, (b) 2007 MAP Communication Arts, and (c) 2006 MAP Mathematics. The fourth context, Null Hypothesis 4, was rejected because there was a statistically significant relationship between student performance on the 2007 MAP achievement test in Mathematics and TYPE of Missouri high school attended as determined by the regression analysis. There was little substantive difference, however, in the results.

Chapter Five summarizes the conducted investigation, offers an examination of the results and seeks to draw conclusions from the data presented in this chapter. The discussion of the results and conclusions of this study, as well as suggestion for best practice, focuses on the areas of essential characteristics of a professional learning community, professional learning communities and the practice of teaching, professional

learning communities and school culture, and professional learning communities and

staff development. Implications for school leaders are discussed, and recommendations

for replication of this study and for further study are submitted.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, DISCUSSIONS, RECOMMENDATIONS

This chapter summarizes the conducted investigation, offers an examination of the results and seeks to draw conclusions from the data presented in Chapter Four. This discussion of the results and conclusions of this study, as well as suggestions for best practice, focuses on the areas of essential characteristics of a professional learning community, professional learning communities and the practice of teaching, professional learning communities and school culture, and professional learning communities and staff development. Implications for school leaders are discussed, and recommendations for replication of this study and for further study are submitted.

Summary of the Study

The purpose of this study was to suggest a response to the following research question: Is there a significant relationship between student achievement scores on the MAP and the type of Missouri high school attended, PLC or NPLC?

The decision of a school site to participate in the Missouri Professional Learning Communities Project could not be manipulated in the described investigation. As such, the research method employed herein was causal-comparative in design. The data collected in this study was of an interval variety, thus lending itself to inferential statistics. This study evaluated a null hypothesis relating student achievement and type of Missouri high school, PLC or NPLC, in four different contexts: (a) 2006 MAP Communication Arts, (b) 2007 MAP Communication Arts, (c) 2006 MAP Mathematics,

and (d) 2007 MAP Mathematics. A significance level of .05 was used to accept or reject the null hypothesis.

The independent variable in this study was the type of high school attended by each member of the studied population, either PLC or NPLC. The dependent variable in this study was the scale score for tenth grade students in the area of Mathematics and of eleventh grade students in the area of Communication Arts, as measured by the Missouri Assessment Program (MAP) achievement test. Variables identified as controlled were socioeconomic status, special education services, and ethnicity.

The MAP achievement test was the instrument utilized to measure student achievement in the state of Missouri. The MAP test was a criterion-referenced and performance-based assessment based on the Show-Me Standards. Each MAP assessment required three to five hours of test administration time and included any of three types of test items: selected-response items, constructed-response items, and performance events (including writing prompts). The selected-response items presented students with a question followed by three or four response options. A subset of selected-response items were extracted from the *Survey* edition of TerraNova™, a nationally-normed test developed by CTB/McGraw-Hill. The constructed-response items required students to supply (rather than select) an appropriate response. Students were asked to show their work when answering questions. In addition to measuring students' content knowledge, constructed-response items provided information about how students arrived at their answers. The performance events used in Missouri's statewide assessment required students to work through more complicated items. Performance events allowed for more than one approach to arrive at a correct response. According to the Missouri Department

of Education (2008), "the advantage of this type of assessment item is that it provides insight into a student's ability to apply knowledge and understanding in real-life situations" (p. 1).

Student performance on the MAP was reported as a three-digit number that ranges between 450 and 910 (referred to as a *scale score*) and was assigned to a corresponding level on a continuum of proficiency: Below Basic, Basic, Proficient, and Advanced. Additionally, the test battery satisfied the criteria for a state-issued assessment as directed by the No Child Left Behind educational initiative of 2001.

The population for this study consisted of all students enrolled in the public high schools of Missouri with a typical ninth through twelfth grade configuration. Students in the tenth grade were assessed in the mathematics portion of the MAP test. Students in the eleventh grade were assessed in the communication arts portion of the MAP test. Schools were selected on the basis of grade configuration and participation in the Missouri Professional Learning Communities Project. To reduce threats to internal validity, all participants of the populations described above were included in the investigation. Participants in the Missouri Professional Learning Communities Project were identified from the website of the *School Improvement Initiatives* section of the Department of Elementary and Secondary Education. Missouri Assessment Program (MAP) historical data for each school was obtained via the archives of the Office of Social and Economic Data Analysis (OSEDA) at the University of Missouri-Columbia. Additionally, descriptive data related to factors of ethnicity, socio-economic status, and student participation in special school services were included in the database provided by OSEDA.

For each context described above, the mean and standard deviation of the respective PLC and NPLC group was determined. Using the Statistical Package for the Social Sciences, the Pearson Correlation Coefficient was then calculated to determine the strength of the relationship between the identified variables. Finally, a model was specified where the independent variables described above were regressed on the dependent variable (2006 and 2007 MAP Communication Arts and Mathematics scale scores, depending on the context). The outcomes of the descriptive statistics, correlation results, and regression analysis for each context were reported. Based on the results of these analyses, Null hypothesis 1, Null hypothesis 2, and Null hypothesis 3 were accepted. Null hypothesis 4, however, was rejected.

<div align="center">Conclusions and Discussion</div>

A discussion of the conclusions of this study, as well as implications for best practice, will focus on essential characteristics of a professional learning community, professional learning communities and the practice of teaching, professional learning communities and school culture, and professional learning communities and staff development. Implications for school leaders will be also be discussed.

<div align="center">*Essential Characteristics of a Professional Learning Community*</div>

The concept of a PLC is based largely on a premise from the business sector regarding the capacity of organizations to learn (Senge, 1990). Thompson, Gregg, and Niska (2004) described the modifications that the learning organization experienced to accommodate the world of education—of becoming a learning community that strived to develop collaborative work cultures for teachers. These school-based learning communities are grounded in two pivotal assumptions: (a) It is assumed that knowledge

is poised in the lived experiences of professional educators and best understood through

critical discussion and reflection and reflection with others who share the same

experience; and (b) it is assumed that actively engaging teachers in PLCs will increase

their professional knowledge and enhance student learning (Buysse, Sparkman, and

Wesley, 2003).

The trend toward establishing PLCs in schools has not been without criticism and

struggle. Rick DuFour (2004) openly bemoaned the fact that all combinations of

individuals with any stake or interest in schools are referring to themselves as PLCs.

According to Vesciso et al (2008), "Everyone from grade level teams to state departments

of education is framing their work in terms of PLCs. Yet using the term PLC does not

demonstrate that a learning community does, in fact exist" (p. 81). There is no assurance,

therefore, that the sites identified as PLC schools in this study demonstrated full

adherence or implementation of PLC characteristics and ideals. Nor is there evidence to

contradict the possibility that the schools that were *not* members of the Missouri

Professional Learning Communities Project at the time of this study might have adhered

to many of the precepts and philosophies of the PLC model.

Implications for Best Practice as Related to Essential Characteristics of a PLC

In 2004, DuFour cautioned educational leaders that the term "PLC" had been

"used so ubiquitously that it is in danger of losing all meaning." (p. 6). To prevent the

PLC model from succumbing to the fate of other well-intentioned school reform efforts,

DuFour (2004) recommended that educators continually reflect on the ways in which

they are endeavoring to entrench the importance of student learning and teacher

collaboration into the culture of their schools. Ultimately, however, these same educators

must critically examine the outcomes of their efforts in terms of student achievement. In

order to evidence results, PLCs must be able to communicate outcomes in terms of

empirical data that actually indicate changed teaching practices and improved student

learning.

Professional Learning Communities and the Practice of Teaching

A primary goal of the PLC model is to change the management and

organizational structure of a school by bringing the entire community together to redefine

its vision. Through subsequent conversation, planning, and collaboration, strategies are

designed and implemented—ultimately resulting in measurable academic improvement.

At its core, therefore, the concept of a PLC rests on the premise of enhancing student

learning by improving teaching practice. It is notable, however, that in a review of

literature on the impact of professional learning communities on teaching practice,

Vescio et al. (2008) described a pervasive trend in which researchers reported that

teachers *perceived* their practices had changed instead of providing descriptions of any

specific changes in pedagogy.

This trend is discernable within the population described in this study. Members

of the Missouri Professional Learning Communities Project received training in data

analysis, creating SMART goals, forming a vision, collaborative teaming, developing and

administering common formative assessments, and creating tiered, school-based

interventions. These selected schools did not, however, necessarily receive state-

sponsored professional development in or for improved instructional techniques and

methodologies. Participation in the project alone, therefore, did not necessarily beget

enhanced teacher effectiveness, nor did it suggest a heightened attentiveness to student learning.

Implications for Professional Learning Communities and the Practice of Teaching

Kaplin and Owings (2004) insisted that teacher effectiveness must be the focus of any successful educational reform effort. The authors indicate that teachers and their respective quality of teaching are the most powerful predictors of student success: "The more years that students work with effective teachers, the higher their measured achievement, far outpacing their peers who start with comparable achievement but who spend consecutive years studying with less effective teachers" (p. 1).

Little (1990) described issues related to working conditions that could impact teacher motivation and effectiveness. These conditions included appropriate teaching assignments, adequate opportunity to work with peers and students, systemic and sustained professional development opportunities, and viable feedback on teaching methods. Each of these elements is integral and implicit within the framework of the professional learning community. Participation in PLCs facilitates professional growth that is driven by the needs of teachers as they are "naturally engaged in efforts to accomplish their goals" (Vescio et al., 2008, p. 86). Berry et al. (2005) reported that teachers in one learning community searched for outside ideas to help them solve their teaching dilemmas, and elsewhere Bolam et al. (2005) indicated that teachers realized a clear connection between their professional learning opportunities within the PLC and changes in their practices and student learning. According to Vescio et al. (2008), PLCs honor both the knowledge and experience of teachers and knowledge and theory generated by other researchers: "Through collaborative inquiry teachers explore new

ideas, current practice, and evidence of student learning using processes that respect them as the experts on what is needed to improve their own practice and increase student learning" (p. 89).

<div align="center">*Professional Learning Communities and School Culture*</div>

In a review of 11 studies related to the impact of professional learning communities on teaching and learning, Vescio et al. (2008) and DuFour (2004) identified characteristics inherent in learning communities that worked to promote changes in school cultures: including teacher collaboration, an instructional emphasis on student learning, and a school-wide focus on results.

Teacher Collaboration

Professional collaboration is evidenced when teachers and administrators work together, share professional knowledge and experience, contribute ideas, and develop plans for the purpose of achieving the goals of the school. True collaborative practice is exemplified when members of a school staff convene on a regular basis in an ongoing attempt to become more effective teachers so that students can become more effective learners (Thompson et al., 2004). According to Louis and Marks (1998), successful collaborative efforts include strategies that "open" practice in ways that encourage sharing, reflecting, and assuming the risks needed to change. Teachers who work within an atmosphere of collaboration do not function in isolation. These educators benefit from insights and exchanges with peers—an activity that has the potential of maximizing learning for all students. The collaborative culture described by the PLC model is critical for collective action, as school improvement in the larger sense has the best opportunity

for success when all individuals involved in the process work collaboratively to identify and solve problems.

The existence of this sort of collaborative culture was not guaranteed by a school's membership in the Missouri Professional Learning Communities Project, nor was it denied by its non-membership. As Dooner et al. stated, "Partners in a collective structure share space, time, and energy, but they need not share visions, aspirations, or intentions" (2008, p. 567). Similarly, the degree of teacher collegiality and/or isolation was an unknown factor in this study, and as Schmoker (2006) asserted, "Schools that have high levels of collaboration or collegiality, yet lack a focus on achievement through assessment, will have little impact on the character and quality of teacher practice (p. 178). Still, given the amazing resiliency to change of the high school (Fullan, 2001), it would not be overly presumptuous to speculate that *not all* teachers in the studied PLC schools were working collaboratively to improve student achievement. This notion is supported by Schmoker (2004b) where the author called teacher collaboration "our most effective tool for improving instruction," yet bemoans the current status of the practice, calling it "exceedingly, dismayingly rare" (p. 431).

Implications for Best Practice in Collaboration

According to the National Board for Professional Teaching Standards (NBPTS, 2004) and the National Commission on Teaching and America's Future (NCTAF, 2003), instructional quality and school effectiveness depended on the degree to which teachers worked in a professional partnership with their colleagues. An effective system of teacher collaboration within a professional learning community, however, does not emerge "spontaneously or by invitation" (Gajda and Koliba, 2008, p. 134). According to Pappano

(2007), if secondary schools are to generate high levels of student learning, leaders must

employ models of supervision, evaluation, and professional development that will

purposefully cultivate high-quality collaboration. Researchers insisted that those working

in a supervisory capacity must:

> demonstrate transparency in their decision-making processes, focus committee
>
> dialogue on the examination of student learning and other essential outcome data,
>
> and use pre-planned and prioritized meeting agendas that communicate a clear
>
> purpose for the group that goes well beyond information dissemination. (Gajda
>
> and Kokiba, 2008, p. 150)

Instructional Emphasis on Student Learning

In a review of research on the impact of professional learning communities on

teaching and learning, Vescio et al. (2008) found persistent focus on student learning to

be the key to increased achievement. Each of the eight referenced studies documented

that the collaborative efforts of teachers in these improved schools were centered on

meeting the learning needs of their students. Elsewhere, in a large-scale study conducted

in England, Bolam et al. (2005) compared PLC characteristics of schools with student

outcome data from a national pupil assessment database. Links between the strength of

PLC characteristics and student achievement were statistically significant at both the

elementary and secondary levels. The authors concluded that, "the greater the extent of

reported staff involvement in professional and pupil learning, the higher was the level of

pupil performing and progress in both primary and secondary schools" (p. 132). These

results suggest that student achievement gains vary with the strength of the PLC within in

the school.

Membership in the Missouri Professional Learning Communities Project did not assure a united adherence to the principles of the model, nor did it promise an unwavering commitment to student learning on the part of every teacher. Alternatively, non-membership did not suggest a lack of commitment to student learning among those school communities. One could safely assume that the strength of the professional learning communities within the studied populations varied considerably and could have influenced any potential learning gains.

Implications for Best Practice in Instructional Emphasis

In 1998, Louis and Marks examined the nature of impact of PLC on pedagogy and student achievement. The researchers concluded that the focus on the intellectual quality of student learning within professional learning communities boosts student achievement because it functions to push teachers toward the use of "authentic pedagogy." A case study by Phillips (2003), collected interview data which revealed that middle school teachers continually analyzed individual student data in an effort to identify ways to advance his/her success both cognitively and affectively. The researcher concluded that the teachers "knew their students' population well and they deliberately created culturally relevant programs to make learning more meaningful" (p. 258).

In a related article, DuFour (2004) contended that when a school truly begins to function as a professional learning community, teachers "become aware of the incongruity between their commitment to ensure learning for all students and their lack of a coordinated strategy to respond when some students do not" (p. 8). Learning teams in a high functioning PLC address this discrepancy by designing strategies to ensure that struggling students receive additional time and support during the school day. DuFour

described the professional learning community's response to students who experience difficulty as: (a) timely, (b) based on intervention rather than remediation, and (c) directive. Schools that are truly committed to the concept of learning for each student, DuFour argues, will "stop subjecting struggling students to a haphazard education lottery…[and] will guarantee that each student receives whatever additional support he or she needs" (p. 9).

School-Wide Focus on Results

Optimally-functioning professional learning communities judge effectiveness on the basis of results (DuFour, 2004). Every teacher team participates in an ongoing process of "identifying the current level of student achievement, establishing a goal to improve the current level, working together to achieve that goal, and providing periodic evidence of progress" (p. 10). In the results-oriented PLC model, data is welcomed and is arranged into relevant and useful information for staff. This data becomes the catalyst for improved teacher practice and informed student interventions. Without the process of turning data into information—information that is needed to support learning—a foundational component of the PLC is missing. It is only with the inclusion of data that the action and activities of a professional learning community are focused on learning and improved student achievement.

The degree to which the participants in the Missouri Professional Learning Communities Project profiled in this study adhered to a school-wide focus on results was unknown. Regional trainings emphasized the importance of data collection and a school-wide results-based orientation. One could reasonably assume that, at some sites, collaborative groups successfully administered regular formative assessments, analyzed

student results, and collectively reflected on areas of concern and responsive strategies.

Like other profiled elements of successful learning communities, however, membership

in the Missouri project did not automatically assure for full functionality of the entirety of

the PLC precepts.

<center>Implications for Best Practice in School-Wide Focus</center>

Determining whether the efforts of educators are resulting in improvements is an

aspect of the professional learning community that cannot be overlooked. According to

DuFour (2004), "A focus on continual improvement and results requires educators to

change traditional practices and revise prevalent assumptions" (p. 11). School

professionals in successful professional learning communities embrace data as a useful

indicator of student progress, stagnation, or regression. At the same time, these educators

consciously work to cease the disregarding of unfavorable data and confront the facts

about the students in the classroom. DuFour contended that genuine learning

communities stop "limiting goals to factors outside of the classroom, such as staff student

discipline and staff morale, and shift their attention to goals that focus on student

learning" (p. 11).

<center>Professional Learning Communities and Staff Development</center>

In 1998, Dennis Sparks, former executive director of the National Staff

Development Council, stated that "professional learning communities are indeed the best

form of staff development" (p. 18). In a 2002 study by Singh and McMillan, researchers

purposed to identify effective staff development practices in schools where there had

been an increase in scores on state-mandated tests over a period of two years. Results

from that investigation were consistent with the conceptual frameworks and themes of the

professional learning community. Practices included an unwavering commitment to student learning, ongoing training centered on the professional needs of teachers, small group collaboration, and a culture of support and success. Comments from teachers revealed that informal staff development was occurring in these schools on a regular basis as the need arose. While some of those interviewed indicated that they did attend more formal staff development sessions at the district, state, or national levels, they maintained that "activities conducted at the building level were more valuable because they were more relevant and practical" (p. 6).

While this sort of professional development might have been the intention of the Missouri Professional Learning Communities Project model, it was not assured in its design. Schools entering the Project were required to form leadership teams of four to six people (one of whom must have been an administrator). Together these teams attended a summer academy and monthly, day-long training meetings throughout the first year of participation in the project. The leadership team, then, was presumed to have had the knowledge and skills necessary to serve as organizers of the implement within their respective schools. From a state and regional vantage, however, there was little to guarantee that these team-based workshops actually translated into the research-based, school-wide action necessary for improved student performance.

Implications for Professional Learning Communities and Staff Development

According to Schmoker (1999), a direct correlation exists between staff development and improvements in student achievement. The author insisted that, for these improvements to occur, the critical components of teacher collaboration, goal-setting, and data analysis—each of which constitute a key element in the professional

learning communities model—must be implicit in the professional development plan of a

school or district. Traditional models of professional development have focused on

providing teachers with the skills and knowledge necessary to be "better" educators.

These models have typically been grounded in the assumption that the purpose of

professional development is to convey to teachers "knowledge *for* practice" (Vescio et

al., 2008, p. 88). In a 2001 study of teacher participation in professional development

activities, however, the National Center for Educational Statistics found that teachers

were most likely to have taken part in professional development that focused on the

integration of education technology into the grade or subject taught, an in-depth study of

the subject area representing the main teaching assignment, and implementing new

methods of teaching (Parsad, Lewis, and Farris, 2001).

The PLC model represents a fundamental shift away from this traditional form of

staff development. At their best, PLCs are grounded in the creation of knowledge *of*

practice. These collaboratively arranged groups of educators regularly work to gather and

analyze relevant data to set priorities and establish goals for professional development

activities. Professional development must be arranged for collective participation—that

teachers from the same school or grade level will have more opportunity to discuss

concepts, share resources, and discuss students' needs across classes. Unlike one-time

workshops, these activities must be "sustained over time so they provide opportunities for

in-depth discussion of content, student understanding of content, and strategies for

teaching the content" (Singh and McMillan, 2002).

Implications for School Leaders

Marzano, Waters, and McNulty (2005) maintained that "a highly effective school leader can have a dramatic influence on the overall academic achievement of students" (p. 10). Elsewhere, University of Wisconsin researchers Newmann and Wehlage (1995) questioned, "How can schools become professional communities? Success depends largely upon human resources and leadership. The effectiveness of a school staff depends much on the quality of leadership" (p. 37). Louis, Kruse, and Raywid (1996) asserted, "The principal plays a critical role in the development of professional learning communities, forging the conditions that give rise to the growth of learning communities in schools" (p. 19). But according to Hughes (2007), "Many leaders have embraced and implemented communities of learners; however the reform has not endured over time" (p. 2).

Neither style of leadership nor quality of leadership within the profiled populations of high schools was investigated in the context of this study. It could be speculated, however, that some of the school- or district-level leaders in the PLC schools may have been ineffective or unsuccessful at evoking or maintaining whole school change like that necessitated by the framework of the professional learning community. Perhaps those leaders were unclear about their primary responsibility—that of ensuring that all students acquire the knowledge, skills, and dispositions essential to their success. They may have been unable to effectively disperse leadership in a collaborative, cooperative manner that would result in collective action. It could also be that the leaders of the PLC high schools may not have been adept at bringing coherence to the

"complexities of schooling" by aligning the structure and culture of the school with its core purpose (DuFour, Eaker, and DuFour, 2008).

According to DuFour, Eaker, and DuFour (2008), educators who hope to cultivate professional learning communities must engage in a conscious, intentional process to impact the culture of their schools. Many involved in the leadership realm of formal education have been habituated to regard school improvement as a program or a policy— something that is purchased, adopted, or implemented. To successfully effect the sort of change that genuine change necessitates, leaders must begin to see school improvement as an ongoing process that builds the collective capacity of an organization to "achieve its purpose, priorities, and goals" (p. 21). In a high-functioning learning community, leaders realize and understand that true, lasting change is a complex, time-intensive journey that requires shared decision-making, a purposeful empowering of teachers and teams, and a widespread distribution of leadership.

<center>Recommendations for Replication</center>

Reflecting on the results and conclusions of the conducted study elicited several issues that could potentially be investigated differently if the investigation were replicated:

1. This study was based on archived data from the 2005-2006 and 2006-2007 school years. The study should be replicated and expanded to determine if any difference in student achievement is statistically significant, based on future data.

2. This study was based on archived data from the 2005-2006 and 2006-2007 school years. The study should be replicated with student-level longitudinal data from

elementary and middle-level PLC and NPLC schools to determine if any

difference in student achievement is statistically significant, based on future data.

3. Although there was only one evaluated context that revealed a statistically

significant difference in student achievement, there were uncontrolled variables in

this study that could have potentially influenced outcomes.

4. The population of schools identified as Professional Learning Communities was

limited to those in receipt of state support as members of the Missouri

Professional Learning Communities Project. This study should be replicated to

include those high schools with a grade configuration of nine through twelve that

endorse the PLC framework, but are not members of the Missouri Professional

Learning Communities Project.

5. The generalizability of this study may be limited, as only high schools in the state

of Missouri were examined.

6. The generalizability of this study may be limited, as only high schools with a

grade configuration of nine through twelve were examined.

7. The generalizability of this study may be limited, as the only assessment

instrument used was the MAP achievement test, which is criterion-referenced to

published state standards.

8. The question of validity of the MAP achievement test as an indicator of

achievement level for children with special needs may indicate the need for a

standardized, norm-referenced assessment to accurately compare achievement

between groups of students.

Limitations

1. This study was limited to high schools in the state of Missouri.

2. This study only involved high schools with a typical ninth through twelfth grade configuration.

3. This study only utilized performance data from two years of MAP tests.

4. This study used student achievement as measured by the MAP achievement test assessment.

5. MAP achievement test scores may be affected by the ability of the proctor to administer the assessment.

6. MAP achievement may be affected by extraneous factors that exist on the day(s) of testing.

7. This study focused only on student achievement differences between high schools that participate in the Missouri PLC project and high schools that do not participate in the Missouri PLC project.

8. This study defined a PLC school as such if it is reported to be a member of the Missouri PLC project. Levels of adherence, implementation, and/or involvement may vary among PLC project schools.

9. This study defined a PLC school as such if it is reported to be a member of the Missouri PLC project. NPLC schools, while not in receipt of state-supported training or sponsored designation, may adhere to and espouse many of the stated principles of the PLC framework.

Recommendations for Further Study

If this investigation were the basis for further study, there are several related issues that may warrant further investigation:

1. School leaders are considered to be the most important factor in either promoting or preventing school change. It would prove interesting to compare leadership styles of administrators in PLC and NPLC schools to investigate if there is any correlation between leadership style and student achievement.

2. The classroom teacher is considered to be the most important factor in student learning. It would prove interesting to conduct a longitudinal observational study to investigate changes in teaching practices as teachers work in professional learning communities.

3. The research question investigated in this study was "Is there a significant difference in student achievement between high schools that are members of the Missouri Professional Learning Communities Project (PLC) and high schools that are not members of the Missouri Professional Learning Communities Project (NPLC)?" It would prove interesting to conduct a survey of teachers in project schools and teachers in PLC schools that are *not* members of the Missouri project to investigate if any significant difference exists in the strength of the implement components between the two populations.

4. The Professional Learning Communities project is one of several agency-endorsed reforms that are currently being implemented to redesign schools and improve student performance. Achievement in PLC schools could be compared to

achievement in schools implementing other initiatives, such as the Coalition of
Essential Schools project or the Accelerated Schools project.

5. Level of participation of schools in the Missouri PLC project is defined by the
number of years the school has received state support. Achievement in PLC
schools could be analyzed based on the level of participation in the project.

6. A study could be conducted to investigate the effectiveness of PLC schools in
meeting legislative mandates such as Adequate Yearly Progress and the
requirements of the Missouri Annual Performance Report.

7. In this study, the archived data utilized for statistical purposes included MAP
achievement test scores in Communication Arts and Mathematics, ethnicity,
student socioeconomic status, and student special education status. Other
demographic archived data is accessible and would lend itself to statistical
analysis. For example, a study could be conducted to investigate the relationship
of teacher experience or financial support in PLC schools to student achievement.

8. Level of implementation of the PLC precepts is recognized as a factor that limits
interpretation of study results. A study could be conducted to investigate if the
level of implementation (as evidenced by survey data) to PLC precepts correlates
with student achievement.

Summary

The findings of this study suggest that there is no significant relationship between
student achievement in Communication Arts or Mathematics and type of Missouri high
school attended, PLC or NPLC, based on the results of the 2006 MAP achievement test.
Additionally, there was no significant relationship between student achievement in

Communication Arts and type of Missouri high school attended, PLC or NPLC, based on the results of the 2007 MAP achievement test. There was, however, a statistically significant relationship between student achievement on the 2007 MAP Mathematics test and type of Missouri high school attended, PLC or NPLC. There was little substantive difference, however, in the results.

A wealth of professional literature, however, suggests that the Professional Learning Communities framework is conducive to effecting change in schools. In the evocation of common sense, few [if any] educators would argue that schools are more effective when teachers work in isolation, when they focus more on what is taught than what is learned, when summative assessments are the only tools used to monitor learning, or when the response to students who are not learning is left to chance or happenstance. Schools that fully embrace the PLC model are committed to increasing student achievement by focusing on learning rather than teaching, working collaboratively and collegially with peers, and maintaining accountability for results.

From a philosophical vantage, the PLC movement exemplifies the essence of best practices that have proven effective in enhancing student performance: data-driven decision making, collaboration in discussion and collectivity in action, the use of research-based strategies and methods to improve student, and sustained and systemic professional activity that is appropriate for all teachers at all stages of the career continuum.

Nevertheless, efforts to identify and document schools that are functioning successfully as professional learning communities has proven to be an incredible challenge for many researchers. There are relatively few models and little universally

clear information to guide the creation of professional learning communities. Although much discussion, hypothesizing, and reporting have transpired in the business sector, there is no guarantee that those experiences would translate well into the arena of public education. Many researchers have lamented the lack of research-based protocols to guide the formulation and establishment of the school-based learning community. Still, schools that make the commitment to the improvement model often face challenges that are unforeseen and unpredictable. Regardless, the journey—as arduous as it may be at times—is well worth the investment of time, energy, and resources if enhanced student learning and dramatically improved school conditions—as mandated by current state and federal legislation—are to be the result.

SOURCES CONSULTED

Achinstein, B. (2002). Conflict amid community: The micropolitics of teacher

    collaboration. *Teachers College Record. 104*(3), 421-455.

Alsalam, N., & Ogle, L. (1990). The condition of education. In L. Ogle (Ed.), *National

    Center for Educational Statistics*. Washington, DC: U.S. Government Printing

    Office.

Astuto, T. A., Clark, D. L., Read, A. M., McGree, K., & Fernandez, L. de K. P. (1993).

    Challenges to dominant assumptions controlling educational reform. Andover,

    MA: Regional Laboratory for the Educational Improvement of the Northeast and

    Islands.

Barth, R. S. (2001). *Learning by heart*. San Francisco: Jossey-Bass Publishers.

Becker, B. E., & Luthar, S. S. (2002). Social-emotional factors affecting achievement

    among disadvantaged students: Closing the achievement gap. *Educational

    Psychologist, 37*(4), 197-214.

Berry, B., Johnson, D., & Montgomery, D. (2005). The power of teacher leadership.

    Educational Leadership, 59(6), 25-27.

Bolam, R., McMahon, A., Stoll, L., Thomas, S., & Wallace, M. (2005). *Creating and

    sustaining professional learning communities*. Research Report Number 637.

    London, England: General Teaching Council for England, Department for

    Education and Skills.

Bolman, L., & Deal, T. (1991). *Reframing organizations: Artistry, choice, and

    Leadership*. San Francisco: Jossey-Bass Publishers.

Buysse, V., Sparkman, K. L., & Wesley, P. W. (2003). Communities of practice: Connecting what we know with what we do. *Exceptional Children, 69*(3), 263-277.

Center on Organization and Restructuring of Schools. (1992). *Collaborative planning time for teachers* (Brief no. 2) [Brochure]. Madison, WI: Author.

Conzemius, A., & O'Neill, J. (2001). *Building shared responsibility for student learning.* Alexandria, VA: Association for Supervision and Curriculum Development.

Cowen, D., Fleming, G., Thompson, T., & Morrissey, M. (2004). Study description: Investigation five PLC schools. In S. M. Hord (Ed.), *Learning together: Leading Together: Changing schools through PLCs* (pp. 15-19). New York: Teachers College Press.

Darling-Hammond, L. (1996a). The quiet revolution: Rethinking teacher development. *Educational Leadership, 53*(6), 4-10.

Darling-Hammond, L. (1996b). What matters most. *Phi Delta Kappan. 78*(3), 193-200.

Darling-Hammond, L. (2005). Teaching as a profession: Lessons in teacher preparation and professional development. *Phi Delta Kappan. 87*(3), 237-240.

Dilworth, R. (1995). The DNA of the learning organization. In C. Sarita and J. Renesch (Eds.), *Learning organizations: Developing cultures for tomorrow's workplace* (pp. 243-254). Portland, OR: Productivity Press.

Dooner, A. M, Mandzuk, D., & Clifton, R. A. (2008). Stages of collaboration and the realities of professional learning communities. *Teaching and Teacher Education, 24*(2008): 564-574.

DuFour, R. & Burnette, B. (2002). *Pull out negativity by its roots*. Retrieved October 18, 2007, from http://www.nsdc.org/library/publications/jsd/burnette233.cfm.

DuFour, R., & Eaker, R. (1998). *Professional learning communities at work: Best practices for enhancing student achievement*. Bloomington, IN: Solution Tree.

DuFour, R., Eaker, R., & DuFour, R. (2005). *On common ground: The power of professional learning communities*. Bloomington, IN: National Education Service.

Eaker, R., & DuFour, R. (2002). *Getting started: Reculturing schools to become professional learning communities*. Bloomington, IN: Solution Tree.

EdSource. (2006). *Similar students, different results: Why do some schools do better?* Retrieved October 1, 2006, from http://edsource.org/pdf/simstusumm06.pdf

Education Trust. (2005). Gaining traction, gaining ground: How some high schools accelerate learning for struggling students. Retrieved October 8, 2006, from http://www2.edtrust.org/NR/rdonlyres/6226B581-83C3-4447-9CE7-31C5694B9EF6/0/GainingTractionGainingGround.pdf.

Elmore, R. (2002). The limits of "change." *Harvard Education Letter*. Retrieved September 13, 2008, from http://www.edletter.org/past/issues/2002-jf/limitsofchange.shtml.

Elmore , R. F. (2000). *Building a new structure for school leadership*. Washington DC: Albert Shanker Institute.

Fullan, M. G. (1990). Staff development, innovation, and institutional development. In *The 1990 ASCD yearbook: Changing school culture through staff development* (pp. 3-25). Alexandria, VA: Association for Supervision and Curriculum Development.

Fullan, M. G. (1991). *The new meaning of educational change*. New York: Teachers College Press.

Fullan, M. G. (2001). *Leading in a culture of change.* San Francisco: Jossey-Bass.

Fullan, M. G. (2002). The change leader. *Educational Leadership, 59*(8), 16-20.

Fullan, M. G. & Hargreaves, A. (1996). *What's worth fighting for in your school?* New York: Teachers College Press.

Gajda, R., & Koliba, C. J. (2008). Evaluating and improving the quality of teacher collaboration: A field-tested framework for secondary school leaders. *NASSP Bulletin 92*(2), 133-153.

Gay, L.R., & Airasian, P. (2003). *Educational research: Competencies for analysis and applications.* (7th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Gideon, B. H. (2002). Structuring schools for teacher collaboration. *Principal Leadership, 68*(2), 30-34.

Gusky, T. (2003). Scooping up meaningful evidence. *Journal of the National Staff Development Council, 24*(4), 27-30.

Haycock, K. (2005, June). *Improving academic achievement and closing gaps between groups in the middle grades*. Presentation given at CASE Middle Level Summit, Keystone, CO.

Hipp, K. K., & Huffman, J. B. (2003, January). *Professional learning communities: Assessment—Development—Effects*. Paper presented at the International Congress for School Effectiveness and Improvement, Sydney, Australia.

Hollins, E. R., McIntyre, L. R., DeBose, C., Hollins, K. S., & Towner, A. (2004). Promoting a self-sustaining learning community: Investigating an internal model for teacher development. *International Journal of Qualitative Studies in Education, 17*(2), 247-264.

Hord, S. M. (2004). *Learning together, leading together: Changing schools through professional learning communities*. New York: Teachers College Press.

Hord, S. M. (1997). *Professional learning communities: Communities of continuous inquiry and improvement*. Austin, TX: Southwest Educational Development Laboratory.

Huffman, J. B., & Hipp, K. A. (2000, April). *Creating communities of learners: The interaction of shared leadership, shared vision, and supportive conditions*. Paper presented at the Annual Meeting of the American Educational Research Association, New Orleans, LA.

Kaplan, L., & Owens, W. (2004). Introduction to special issue: Teacher effectiveness. *NASSP Bulletin, 88*(638), 1-4.

Kruse, S., Louis, K. S., and & Bryk, A. S. (1994). *Building professional community in schools*. Madison, WI: University of Wisconsin, Center on Organization and Restructuring of Schools.

Kruse, S., & Louis, K. S. (1995). *Teacher teaming: Opportunities and dilemmas. Brief to Principals.* Madison, WI: University of Wisconsin, Center on Organization and Restructuring of Schools.

Kruse, S., & Louis, K. S. (2001). Professional communities and learning communities: What school leaders need to know. *Orbit Magazine for Schools*, *30*(1), 7-9.

Jackson, A. W., & Davis, G. A. (2000). *Turning points 2000: Educating adolescents in the 21st century*. New York and Westerville, OH: Teachers College Press and National Middle School Association.

Jones, J. P. (2007). *Moreno elementary school.* Retrieved December 21, 2007, from http://www.allthingsplc.info/evidence/morenoelementaryschool/index.php.

Langford, L. (2003). Proper selfishness: Hallmark of a professional learning community. *Teacher Librarian, 31*(1), 19-21.

Little, J. W. (December, 2006). *Professional community and professional development in the learning centered school*. Retrieved December 21, 2007, from http://www.nea.org/research/bestpractices/images/pdbrief.pdf.

Little, J. W. (1990). The persistence of privacy: Autonomy and initiative in teachers' professional relations. *Teachers College Record. 91*(4), 509-536.

Louis, K., Kruse, S., & Raywid, M. (1996, May). Putting teachers at the center of Reform. *NASSP Bulletin. 80*(580), 9-21.

Louis, K. S., and Marks, H. M. (1998). Does professional learning community affect the classroom? Teachers' work and student experiences in restructuring schools. *American Journal of Education, 106*(4), 532-575.

Marzano, R. J. (2003). *What works in schools: Translating research into action*.

    Alexandria, VA: Association for Supervision and Curriculum Development.

Mclaughlin, M. W., & Talbert, J. E. (2001). *Professional communities and the work*

    of high school teaching. Chicago, IL: University of Chicago Press.

Mid-Continent Research for Education and Learning. (2006). *Student achievement*

    improves in Ignacio, Colorado with McREL support. Retrieved October 1, 2006,

    from http://mcrel.org/about/work/ignacio.asp.

Missouri Department of Elementary and Secondary Education (2008). Missouri

    assessment program guide to interpreting results. Retrieved September 13, 2008,

    from http://dese.mo.gov/divimprove/assess/map/documents/girmanual.pdf.

Missouri Department of Elementary and Secondary Education. (2007a). *Missouri*

    professional learning communities fact sheet. Retrieved September 8, 2007, from

    http://www.dese.mo.gov/divteachqual/sii/MPLC_FactSheet2007.pdf.

Missouri Department of Elementary and Secondary Education (2007b). Missouri

    professional learning communities project. Retrieved September 8, 2007, from

    http://www.dese.mo.gov/divteachqual/sii/prolearning/description.htm.

Missouri Department of Elementary and Secondary Education (2007c). Missouri

    assessment program: technical report 2007. Retrieved October 28, 2008 from

    http://dese.mo.gov/divimprove/assess/tech/Final%20MAP%20Tech%20Report.pdf

Morrissey, M. S. (2000). *Professional learning communities: An ongoing exploration*.

    Austin, TX: Southwest Educational Development Laboratory.

National Association of Elementary School Principals. (2001). *Leading learning*

    communities: Standards for what principals should know and be able to do.

    Retrieved July 26, 2008, from www.naesp.org/client_files/LLC-Exec-Sum.pdf

National Association of Secondary School Principals. (2004). *Breaking ranks II: Strategies for leading high school reform.* Reston, VA: Author.

National Association of Secondary School Principals. (2006). *Breaking ranks in the Middle: Strategies for leading middle level reform.* Reston, VA: Author.

National Board for Professional Teaching Standards. (2004). *What teachers should know and be able to do: The five core propositions*. Retrieved August 23, 2008, from http://www.nbpts.org/UserFiles/File/what_teachers.pdf.

National Commission on Excellence in Education. (1983). *A nation at risk: The imperative for educational reform.* Washington, DC: Government Printing Office.

National Commission on Teaching and America's Future. (2003). *No dream denied: A pledge to America's children.* Washington, DC: Author.

National Staff Development Council. (2003). *Standards for staff development*. Oxford, OH: National Staff Development Council.

Newmann, F. & Wehlage, G. (1995). *Successful school restructuring: A report to the public and educators by the center for restructuring schools*. Madison, WI: University of Wisconsin.

Newmann, F. M. (1994). School-wide professional community. *Issues in Restructuring Schools, 6*(1), 1-19.

O'Neill, J. & Conzemius, A. (2006). *The power of smart goals: Using goals to improve student learning.* Bloomington, IN: Solution-Tree.

Orenstein, A. C., & Hunkins, F. P. (2004). *Curriculum foundations, principles, and issues.* Boston: Pearson Education, Inc.

Outstanding Schools Act. (1993). Missouri Statutes §160.514.

Pappano, L. (2007). More than "making nice": Getting teachers to (truly) collaborate. *Harvard Education Letter, 23*(2), 1-3.

Parsad, B., Lewis, L., & Farris, E. (2001). *Teacher preparation and professional development*. 2000. Washington, D.C.: National Center for Educational Statistics, U.S. Department of Education.

Phillips, J. (2003). Powerful learning: Creating learning communities in urban school reform. *Journal of Curriculum and Supervision, 18*(3), 240-258.

Reese, W. J. (2005). *America's public schools: From the common school to no child left behind*. Baltimore, MD: The Johns Hopkins University Press.

Reeves, D. B. (2004). Accountability in action: A blueprint for learning organizations (2nd ed.). Englewood, CO: Advanced Learning Press.

Rentfro, E. R. (2007). Professional learning communities impact student success. Retrieved January 4, 2007, from http://www.naesp.org/ContentLoad.do ?contentId=2383

Rosenholtz, S. J. (1992). *Teachers' workplace: The social organization of schools*. New York: Teacher College Press.

Schmoker, M. (2004). Learning communities at the crossroads: Toward the best schools we've had. *Phi Delta Kappan, 86*(1), 84-88.

Schmoker, M. (2004). Tipping point: From feckless reform to substantive instructional Improvement. *Phi Delta Kappan, 85*(6), 424-432.

Schmoker, M. (2006). *Results now: How we can achieve unprecedented improvements in teaching and learning.* Alexandria, VA: Association for Supervision and Curriculum Development.

Schlechty, P. C. (1997). *Inventing better schools: An action plan for educational reform.* San Francisco, CA: Jossey-Bass.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization.* New York: Currency Doubleday.

Senge, P., Cambron-McCabe, N., Lucas, T., Smith, B., Dutton, J., & Kleiner, A. (2000). *Schools that learn. A fifth discipline fieldbook for educators, parents, and everyone who cares about education.* New York: Currency Doubleday.

Sergiovanni, T. J. (1994). *Building community in schools.* San Francisco: Jossey-Bass.

Singh, J., & McMillan, J. H. (2002, April). *Staff development practices in schools demonstrating significant improvement on high-stakes tests* [Electronic version]. Paper presented at the 2002 Annual Meeting of the American Educational Research Association, April 1, New Orleans, LA. (ERIC Document Reproduction Service No. ED464103). Retrieved September 8, 2008 from ERIC database.

Snow, C. E., Burns, M. E., & Griffin, P.(Eds.).(1998). *Preventing reading difficulties in young children.* Washington D.C.: National Academy Press.

Sparks, D. (1998). Professional development. *AEA Advocate*, 18-21.

Sparks, D. (1999). Real-life view: An interview with Ann Lieberman. *Journal of Staff Development, 22*(3). Retrieved July 26, 2008, from http://www.nsdc.org/library/publications/jsd.lieberman204.cfm

Supovitz, J. A. (2002). Developing communities of instructional practice. *Teachers College Record, 104*(8), 1591-1626.

Thompson, S. C., Gregg, L., & Niska, J. M. (2004). Professional learning communities, leadership, and student learning. *Research in Middle Level Education, 28*(1), 1-15.

U.S. Department of Education. (1996). *Eighth-grade mathematics lessons: United States, Japan, and Germany* (NCES Publication No. 97-1023R). Washington, DC: U.S. Government Printing Office.

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education 24*(2008), 80-91.

Wells, C., & Feun, L. (2007). Implementation of learning community principles: A study of six high schools. *NASSP Bulletin, 91*(2), 141-160.