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An Examination of Teacher Perceptions Within Professional Learning Communities

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An Examination of Teacher Perceptions Within Professional Learning Communities

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Approval Page

This applied dissertation was submitted by Tiffany Nicole Reese under the direction of the persons listed below. It was submitted to the Abraham S. Fischler College of Education and approved in partial fulfillment of the requirements for the degree of Doctor of Education at Nova Southeastern University.

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Statement of Original Work

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Tiffany Nicole Reese
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"And whatever you ask in prayer, you will receive, if you have faith." Matthew 21:22

"She laughs without fear of the future." Proverbs 31:25

Abstract

An Examination of Teacher Perceptions Within Professional Learning Communities. Tiffany Nicole Reese, 2018: Applied Dissertation, Nova Southeastern University, Abraham S. Fischler College of Education. Keywords: communities of practice, teacher attitudes, teacher effectiveness, interprofessional relationship, collegiality

This applied dissertation was designed to determine the strength of the relationship between elementary teachers' perceptions of the six school practices of the professional learning community (PLC) model and students' science achievement and if differences exist among teachers at the target school district's five elementary schools. The six practices of the PLC model are (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions–relationships, and (f) supportive conditions–structures. The PLCs are presently defined as one of the most discussed school reforms within kindergarten to Grade 12. They assist in advancing best instructional practices and educator collaboration, which has been instrumental in enhancing teacher and student learning.

There is a need to address the diverse learning styles of students and ways teachers can prepare students to be 21st-century learners. The researcher investigated fifth-grade teachers' perceptions across five elementary schools in the target district. The perceptions and practices of PLC members have an impact on the success of the learning community. The findings in this study suggested a need for shared and supportive leadership. Findings also indicate there is a need to build strong, trusting relationships among PLC members to enhance student learning.

Administrators, teachers, and stakeholders are accountable for each other; so the research indicated that systems need to be in place that allow PLC members to work as a cohesive team to enhance student learning and achievement. The study's results provided insight on barriers impacting elementary professional learning communities including the school environment. The environment of an effective PLC allows members to build positive relationships, cultivate collegial discourse, and action research to enhance student learning. The results of this study may help educators improve collaborative efforts and teaching practices that are focused upon the science achievement for students.

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Chapter 1: Introduction

In an age of compliance, increased accountability, and data-driven instruction, school districts across America must seek to improve teacher effectiveness and increase student achievement (Missouri Department of Elementary and Secondary Education [MDESE], 2016a; Stewart, 2017). To accomplish these ultimate goals, schools have shifted from a culture of isolation to one of collaboration (Stamper, 2015). Professional learning communities (PLC) represent a method by which schools seek to transform all aspects of the school's culture by promoting collaboration among stakeholders (Stamper, 2015; Stewart, 2017). The PLC model is rooted in the framework of both organizational learning theory and social learning theory (Krier, 2014; Robbins, 2013). Organizational learning theory is the process of disseminating knowledge to various stakeholders within the organization, and social learning theory involves internal factors (e.g., cognitive skills, self-efficacy) and external factors, such as the ability to observe and model others (Krier, 2014; Stewart, 2017).

The PLCs are collaborative. The PLCs transform the school culture and norms of an organization by creating an environment of ongoing collaborative inquiry (DuFour & DuFour, 2012). The PLCs are composed of a group of school-level stakeholders who collaborate regularly to improve instructional practices and ensure that the school's mission and goals align with those of the community and the school district (Stewart, 2017). These stakeholders include teachers, support personnel, and school-level administrators (Golden, 2017; Stewart, 2017). The essential characteristics of PLCs are (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions–relationships, and (f) supportive conditions–structures (DuFour & DuFour, 2012).

Supportive and shared leadership involves school administrators abdicating an independent leadership model and adopting a collaborative model in which teachers assume leadership responsibilities (Golden, 2017; Stewart, 2017). Under the shared leadership construct, teachers have the capacity and autonomy to promote substantive change within the school building (Stamper, 2015; Stewart, 2017). Collective learning, once referred to as collective creativity, is a process wherein all stakeholders collectively seek opportunities to increase their professional knowledge and collectively apply their knowledge to solve issues and to promote positive interpersonal relationships among all stakeholders (McDermott, 2016). The construct of shared value and vision is an unrelenting commitment by all stakeholders to implement practices and to create a culture that promotes student achievement (Olivier & Huffman, 2016).

The PLCs are supportive. The supportive conditions dimension in PLCs are both relational and structures. These conditions are requisite supports that stakeholders need to make substantive change within the school building (Higgins, 2016). The supports include a dynamic leadership structure that facilitates collaboration among stakeholders and stakeholders being amenable to using varied forms of communication to collaborate (Almanzar, 2014; Higgins, 2016). Shared personal practice is the fostering of collegial relationships between educators as demonstrated by their willingness to visit colleagues' classrooms and gain insight into effective instructional and relational practices (Higgins, 2016; Olivier & Huffman, 2016).

Members of the PLC community are committed to the shared values and vision of the community. The members' level of commitment to student learning and their willingness to accept their roles and responsibilities in the learning community determine the success of the PLC (DuFour & DuFour, 2012; Higgins, 2016). To ensure success,

members of the PLC must actively engage in intentional and collegial learning to promote student achievement and meaningful dialogue which, in turn, fosters the implementation of innovative and effective pedagogical practices (Almanzar, 2014; DuFour & DuFour, 2012; Higgins, 2016).

Statement of the Problem

Although the target school district had used the PLC model for over 10 years, the target district had not determined teachers' perceptions of the PLC model. Additionally, the school district had not determined if there were differences in teachers' perceptions of the PLC model across the school district's five elementary schools. The six practices of the PLC model that were examined in this applied dissertation were (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions–relationships, and (f) supportive conditions–structures (DuFour & DuFour, 2012; Higgins, 2016; Stewart, 2017).

The target school district initiated the PLC model across its five schools to increase teacher effectiveness and consequently improve student achievement. Although the implementation of the PLC model increased the level of collegiality among staff members and promoted a collective vision within schools (P. LeMay, personal communication, October 30, 2016), the school district's elementary schools failed to meet their growth targets for adequate yearly progress in science for the 2015-2016 school year (MDESE, 2016b). By investigating teachers' perceptions of the PLC model, the researcher sought to provide a foundation for further research and to identify strengths and weaknesses of the PLC models across the target school district's five elementary schools (Baker, 2015; Mulligan, 2016).

The topic. Researchers and professional organizations endorse PLCs (DuFour & DuFour, 2012; Watson, 2014). The PLCs represent a well-respected and recognized strategy for educational reforms. School districts implement PLCs to foster a school climate of constructive dialogue among stakeholders, ensure the implementation of data-driven instruction, and provide systems to support teacher and student learning (Allen, 2013; Stewart, 2017; Watson, 2014). The PLC is a construct through which teachers identify students' deficits, engage in reflective dialogue, and develop a data-based plan to increase student achievement (Mulligan, 2016; Parks, 2014). Through participation in an effective PLC, educators can transform their pedagogical practices through data-driven instruction, which has been effective in increasing student achievement (Parks, 2014). Determining if teachers perceive their school's PLC model is a framework for promoting professional growth is a vital component, therefore, for increasing student achievement is paramount (Baker, 2015).

Background and significance of the problem. High-stakes testing and increased accountability at district and school levels have compelled key stakeholders and school leaders to implement initiatives for improving learning for all students (MDESE, 2015, 2016c). The MDESE utilizes the Missouri school improvement program (MDESE, 2015), which is the state's accountability system that is responsible for reviewing and accrediting school districts in the state. Each school district must develop and maintain a comprehensive school plan designed to promotes continuous student growth and achievement (MDESE, 2016d). Each school year, MDESE generates annual performance reports for every school in the state. These reports determine the supports and interventions each school needs (MDESE, 2012).

The target school district's comprehensive school plan includes goals, strategies,

and action steps to guide (a) governance, (b) student performance, (c) highly qualified staff, (d) facilities, (e) support and instructional resources, and (f) parent and community involvement. Teachers engage in ongoing collaborative inquiry, analyzing student assessment data, and engaging in both collaborative lesson planning and reflective pedagogical dialogue. Although the target school district received full accreditation from the MDESE and implemented the PLC model, all five of its elementary schools failed to meet their required annual progress growth targets in science for the 2015-2016 school year (MDESE, 2016a).

Description of the setting. The setting for this study was a suburban school district in a midwestern state. This school district serves over 4,200 students. The district has an early childhood center, four elementary schools, a kindergarten through Grade 8 school, middle school for Grades 6 to 8, high school for Grades 9 to 12, and an alternative school for kindergarten through Grade 12. Student enrollment increased by 12% from 2011 to 2016. Student demographics for the district were as follows: (a) African American = 52%, (b) Caucasian = 21%, (c) Hispanic = 19%, and (d) Asian, Indian, or other minority backgrounds = 8%. Approximately 79% of the district's students receive free and reduced-price lunches.

The researcher's role. The researcher is a lifelong resident of the target midwestern state and a graduate of one of its public school systems. The researcher attended the University of Missouri–Kansas City and earned two degrees (i.e., bachelor of liberal arts and master of arts in special education). Currently, the researcher is an elementary special education teacher servicing kindergarten through fifth-grade students who have mild to moderate disabilities. The researcher taught at one of district's elementary schools for 3 years and was a special education teacher for 5 years. The

researcher was also a special education process coordinator for 5 years in another school district and taught special education in two school districts, both of which implemented the PLC model.

The research problem. The target school district had been implementing the PLC model for over 10 years. The problem was that it was unknown if the school-based PLC initiative, which the target district implemented during the 2015-2016 school year, impacted teachers' instructional and professional practices and impacted students' academic achievement in science. The district invested time and funding to implement the PLC initiative. The instructional coaches, principals, and other administrators provided PLC professional development during both faculty meetings and collaborative meetings. School district administrators expected all teachers to attend at least two collaborative meetings each week. Each school year, the district provided professional development to new and existing staff members to ensure an understanding of the vocabulary and objectives of the PLC process.

The researcher is a special education teacher at one of the elementary schools that met its performance targets for adequate yearly progress and received the accredited with distinction status because its third, fourth, and fifth graders demonstrated achievement growth on the state assessment in English-language arts and mathematics (MDESE, 2016b). Although the researcher's school made growth in English-language arts and mathematics and received the accredited with distinction status, less than 40% of its fifth-grade students scored in the proficient and advanced range in science (MDESE, 2016c).

Teachers at the researcher's school district utilized the constructs of the PLC model to meet the goals of their school improvement plan. However, three of the five elementary schools in the target district did not meet their growth targets in both English-

language arts and mathematics, and all five of the elementary schools did not meet their growth targets in science (MDESE, 2016c, 2016d). The inability of the elementary schools to meet their growth targets in three academic areas and the lack of knowledge of the perceptions of the five elementary schools' teachers regarding the PLC model were the impetus for conducting this study.

Deficiencies in the evidence. Prior research investigated the impact of PLCs on teacher instruction, student achievement, teacher efficacy, teacher collaboration, leadership, and improving professional development (DuFour & DuFour, 2012; Golden, 2017; Mulligan, 2016; Murphy, 2015; Robbins, 2013; Stamper, 2015; Stewart, 2017; Watson, 2014). Although there is an extensive body of qualitative research that investigated teachers' perceptions of PLCs, there is a limited body of quantitative research that has investigated their perceptions of PLCs. By conducting this study, the researcher believed it was possible to identify barriers impacting both the effectiveness of PLCs at the target school district's five elementary schools and the ability of the target schools to implement effective teaching practices and improve student learning. The researcher also believed that conducting this type of a study increased the body of knowledge regarding teachers' perceptions of PLCs.

The audience. The audience for this study involved teachers, instructional coaches, school-level administrators, and district-level administrators from one midwestern school district. The findings of this study may have increased stakeholders' scope of knowledge regarding teachers' perceptions of the PLC constructs and revealed potential barriers that impact the capacity of the five elementary schools to promote effective teaching practices and improve both teacher and student learning. By identifying potential barriers, the researcher may have identified corrective

recommendations to maximize the benefits of PLCs, improve learning communities within the target district, and provide recommendations for further research regarding PLCs.

Definition of Terms

For the purpose of this applied dissertation, the following terms are defined.

Annual performance report. In accordance with both state law and the regulations set forth by the Missouri State Board of Education, the annual performance report is the 3-year average of a school district's performance across the following five categories: academic achievement, subgroup achievement, college and career readiness, graduation rate, and attendance. The Missouri State Board of Education uses the points each school district earns to determine its accreditation status (MDESE, 2016b).

Collaboration. Within PLCs, collaboration is a process in which educational stakeholders establish school norms, commit to engage in active listening, share strategies to improve student achievement, and seek to arrive at a consensus regarding critical school matters (DuFour & DuFour, 2012; Fields, 2013). Fostering trust among group members is the foundation for successful collaboration (Bryk, Gomez, Grunow, & LeMahieu, 2015; Fields, 2013; Khan, Saleem, Qayyum, & Tahir, 2015; Oswick & Grant, 2016; Peterson, 2015).

Collaborative planning. An essential component of the PLC model, collaborative planning is a process in which teachers across either grade levels or subject areas meet regularly to exchange ideas pertaining to curriculum and pedagogical practice (Fields, 2013; Ronfeldt, Farmer, McQueen, & Grissom, 2015). Through the process of collaborative planning, teachers foster a professional support system (Fields, 2013).

Collective inquiry. The construct of collective inquiry is a process wherein

teachers seek to improve professional practice by examining student achievement data, reflecting upon past and current pedagogical practices, and collectively identifying new methods and practices to promote student success (Carpenter, 2015).

Comprehensive school improvement plan. This term refers to the method through which schools identify achievement deficits and needs of their students and formulate a plan to ensure their students are college and career ready (MDESE, 2014).

Missouri assessment program. This term refers to the state's annual standardized assessment program that measures students' skills and knowledge across several academic domains. The state learning standards determine the knowledge and skills students in each grade level of for each academic subject. The assessments yield academic achievement data at the student, class, school, district, and state levels. School districts use the data to identify strengths and weaknesses across schools and among subgroups such as minority students, students from low socioeconomic backgrounds, and students with disabilities (MDESE, 2014).

The Missouri assessment program is composed of a series of yearly standardized assessments that assess the academic knowledge and skills of Missouri's public school students. The state of Missouri reports each student's performance on a performance assessment as a numeric value and then assigns one of the following achievement-level designations: below basic, basic, proficient, and advanced. Each achievement-level designation has a corresponding score range that varies according to the subject area and the grade level (MDESE, 2014).

Missouri assessment program performance index. This term refers to a school's single composite score that composes the program performance of each of its students across subject areas, grade levels, and subgroups (MDESE, 2015). The MDESE

uses the performance index to establish performance targets for schools and their student subgroups (MDESE, 2015). The MDESE reports student performance on the state assessment as below basic, basic, proficient, or advanced and then assigns a corresponding point value to each performance designation (MDESE, 2014).

Professional learning communities (PLC). This term refers to educational stakeholders who meet regularly to determine the most appropriate courses of action to improve student achievement. The PLCs promote collegiality among educational stakeholders by participating in ongoing professional development, engaging in action research, and demonstrating a staunch commitment to practice the essential characteristics of PLCs, which are supportive and shared leadership, collective learning, shared values and vision, supportive conditions, and shared personal practice.

Sustaining stage. The sustaining stage is the fourth stage on the PLC continuum. Cunningham (2016) described the sustaining stage as a construct that is interwoven into the school's mission and overarching goals, and all stakeholders demonstrate an unrelenting commitment to creating a school culture that brings about positive outcomes.

Purpose of the Study

The purpose of this study was to determine if teachers' perceptions of the six tenets of the PLC framework varied across five elementary schools within a suburban school district located in the midwestern part of the United States. Although the PLC model had been implemented over 10 years, the target school district had not investigated teachers' perceptions of the extent to which school-level practices impact their professional learning. By conducting this study, the researcher increased the body of knowledge within the target school district regarding teachers' perceptions of the framework of a PLC and its ability to provide a foundation for teachers' professional

growth; moreover, the researcher increased the body of knowledge concerning the ability of each practice of the PLC model to promote ongoing professional growth among the target elementary school teachers.

Determining teachers' perceptions of the PLC model and its related practices could compel school-level stakeholders to analyze components of their PLC model. By analyzing components of their PLC model, stakeholders may be able to identify barriers that impact teacher growth and student learning. The researcher notes that promoting student achievement across the target school district's five elementary schools is critical because all elementary schools failed to meet their growth targets for adequate yearly progress in science for the 2015-2016 school year.

Chapter 2: Literature Review

Introduction

The construct of PLCs emerged in the early 1960s to reduce the isolated nature of the teaching profession and to promote collegiality among educators (Dougherty-Stahl, 2015). Historically, teachers used a one-size-fits-all approach to instruction that proved to be ineffective and, as a result, increased learning gaps for some students (Philpott & Oates, 2017). The scope of research regarding PLCs within schools expanded throughout the 1970s and 1980s (Williams, 2013). Researchers found that teachers who expanded their professional roles and collaborated with their colleagues addressed the varied needs of their students (Marzano, Heflebower, Hoegh, Warrick, & Grift, 2017; Owen, 2014).

Theoretical Framework

There were two complementary theoretical frameworks for the study: constructivist learning theory and organizational learning theory (Senge, 2000, 2006; Vygotsky, 1978, 1986). Social constructivism and organizational learning theory represent the framework upon which learning organizations establish the attributes of and the outcomes for PLCs (Karpen, 2015; Simanjuntak & Maruli, 2015). Social constructivism is appropriate for this applied dissertation because social interactions, team collaboration, and collective inquiry are distinguishing characteristics of effective PLCs (Aylsworth, 2012; Karpen, 2015; Vygotsky, 1986). Organizational change theory is appropriate for this research study because effective change will not occur unless the members of the PLC collectively analyze all aspects of the school culture, adapt new mindsets and approaches, and accept a new leadership paradigm (Finley, 2013).

Social constructivism. Three essential themes undergird Vygotsky's social constructivism: (a) social interactions, (b) the more knowledgeable other, and (c) the zone

of proximal development (Vygotsky, 1978, 1986). Vygotsky (1978) found that social interactions are the foundation upon which individuals construct knowledge. The more knowledgeable other is the individual who distinguishes himself or herself from others by demonstrating a high level of knowledge. Despite the knowledge gap, Vygotsky (1986) concluded that others can increase their knowledge by engaging in thought provoking interactions with this individual. The zone of proximal development is the gap between what the learner can complete independently and what the learner cannot complete independently (Vygotsky, 1978). In a social learning situation, the zone of proximal development refers to the gap between what an individual can accomplish individually and what the group can accomplish collectively (Vygotsky, 1986).

Organizational learning theory. According to Senge (2006), the organizational learning theory consists of individuals continuously developing their capacity to create desired results through innovative thinking and generative learning. The Senge model includes the following disciplines: (a) system thinking, (b) personal mastery, (c) mental models, (d) shared vision, and (e) team learning (Senge, 2000, 2006). According to Senge, system thinking is a framework of systematic thinking that individuals use to recognize interrelationships, cause-effect patterns, and underlying influences within an organization. Personal mastery involves individuals engaging in personal development and growth.

Mental models represent the assumptions, ideas, values, beliefs and mindset that impact individuals' thoughts and actions (Senge, 2000). Shared vision is a common goal that has a clear link to the organization's purpose (Senge, 2000). By adopting this shared vision, group members recognize that the whole is greater than the sum of its parts (Senge, 2006). Team learning is a process wherein group members engage in active

learning and meaningful dialogue, share ideas, and solve issues within an organization (Senge, 2006). These five disciplines are the core characteristics of an effective PLC model, wherein learning occurs at all levels and people become change agents who shift their mindset from being reactive to the present to preparing for the future (Finley, 2013).

The members of PLCs engage in both professional-development opportunities and meaningful learning activities to improve their professional practice (DuFour & DuFour, 2012; Finley, 2013). A platform for social constructivist learning, PLCs cultivate and offer a collaborative learning environment (Aylsworth, 2012; Finley, 2013). Vygotsky (1986) asserted that social interactions through mediated tools and meaningful learning activities foster individuals' ability to engage in a form of metacognitive self-regulation of behavior and thereby activates their ability to learn. The collaborative efforts of PLC members allow them to engage in rich dialogue and to share their professional knowledge and experiences about increasing student achievement (DuFour & DuFour, 2012; Vygotsky, 1978).

Senge (2006) believed a perfect learning organization is not an attainable goal; nonetheless, members of the learning organization must follow the ideas and principles to sustain continuous change and growth. By creating these conditions, the organization taps into everyone's commitment and capacity to learn at all levels (Finley, 2013). The culture of learning organizations encourages active and lifelong learning for all members of the community (Senge, 2000). The PLCs are the conceptual framework for reculturing the school and transforming the behaviors of its members (Marzano et al., 2017). The following three themes are prevalent in the conceptual framework of a PLC and are the foundation upon which schools develop policies and programs: (a) group members developing a cohesive mission statement, vision, values, and goals; (b) group members

working together to achieve common goals; and, (c) group members focusing on producing data-driven results to demonstrate continuous improvement (DuFour & DuFour, 2012). Members of PLCs can use this conceptual framework as a guide throughout the improvement process and as an instrument to assess the effectiveness of the PLC (DuFour & DuFour, 2012).

Evidence of Underperformance

Over 30 years ago, the National Commission on Excellence in Education (1983) released its report entitled *A Nation at Risk*. The Commission found pervasive issues across the American public school system and stressed the need for educational reform. Since the Commission published its report, educational policy makers have implemented educational reforms aimed at improving America's educational system. In 2001, Congress passed the No Child Left Behind Act. The federal mandate was the catalyst for schools to adopt initiatives such as PLCs to improve teacher instructional practices (DuFour & DuFour, 2012). The legislation also forced public schools to focus on improving students' standardized test scores, to increase teacher accountability, and to implement compliance-driven systems (DuFour & DuFour, 2012). Many school districts across the country have chosen to implement the PLC model to improve underperforming schools and increase student achievement (Marzano et al., 2017).

Student achievement around the world. Every 3 years, the United States participates in the Programme for International Student Assessment (Organization for Economic Cooperation Development, 2016). The program measures students' ability to apply academic knowledge in real-world situations. The test is administered in reading, mathematics, and science to 15-year-old students in 35 developed nations. Kastberg, Chen, and Murray (2016) found that students in the United States ranked 20th in reading

literacy, 19th in science, and 31st in mathematics when compared to their peers from other developed nations.

DeSilver (2017) conducted similar comparisons between American students and their international peers; however, and unlike Kastberg et al. (2016), DeSilver focused on math and science achievement scores and expanded the scope of the study by comparing American students and students from 60 other countries. Students' scores on the Trends in International Mathematics and Science Study were the data they compared. The test has been administered to fourth-grade students and eighth-grade students every 4 years since 1995. DeSilver found that approximately 20% of the countries had higher scores in science than the United States, and approximately the same percentage of the countries had higher scores in math. Saxena and Sell (2016) concluded that students from East Asian countries, which included Singapore, the Republic of Korea, Hong Kong, China, Chinese Taipei, and Japan, had disproportionately higher scores on both the 2012 Programme for International Student Assessment and the 2011 Trends in International Mathematics and Science Study than students from the United States.

The rate at which American students have improved their math and science achievement when compared to their peers from other industrialized nations could contribute to the achievement gap. Hanushek, Peterson, and Woessmann (2012) investigated international data trends among American students and their international peers. They focused on the reading, math, and science scores of fourth- and eighth-grade students. Hanushek et al. found that, although the achievement scores of American students improved across all content areas over a 14-year period, the scores of students from other developed nations improved at a significantly greater rate than those of American students. For example, students in Latvia, Chile, and Brazil improved their

scores on international assessments at a rate that was three times higher than that of American students. Students in Portugal, Hong Kong, Germany, Poland, Liechtenstein, Slovenia. Columbia, and Lithuania improved at a rate that was two times higher than that of students of the United States. They concluded the discrepancy in the rate of improvement between American students and their international peers contributed to achievement gaps across grade levels and subject areas.

Student achievement at the national level. Although the United States is a wealthy country that invests a considerable amount of money in its educational system, researchers found that American students from low socioeconomic backgrounds scored poorly on the Programme for International Student Assessment (Organization for Economic Cooperation Development, 2016). Students of low socioeconomic status had disproportionately lower science achievement scores than their peers of middle or high socioeconomic status. Researchers have also compared science achievement between racial groups and found that approximately two thirds of African American students failed to demonstrate grade-level proficiency, and approximately one fifth of Caucasian students failed to demonstrate grade-level proficiency.

DeSilver (2017) cited the results of the 2015 National Assessment of Educational Progress and found gaps in science achievement among U.S. students, especially in secondary education students, in which less than 25% of 12th-grade students scored in the proficient range. The test is administered nationally to students in Grades 4, 8, and 12 in the content areas of mathematics, reading, science, and writing. DeSilver noted that less than one third of U.S. students scored in the proficient range on the 2015 assessment in science, and less than one third scored in the below basic range on the same assessment.

Researchers believed the low levels of science achievement among American students had far-reaching implications on the U.S. economy (Burns, 2013; Dailey & Robinson, 2016). Researchers also noted the limited number of high school graduates enrolling in science, technology, engineering, and math majors and the dearth of college graduates entering professions in these fields (Burns, 2013; West, 2012). Dailey and Robinson (2016) concluded the lack of knowledge across the disciplines of science, technology, engineering, and math among American students and the limited number of college graduates entering professions related to these fields could impact America's ability to remain a global economic power.

Student achievement across the state. According to the MDESE (2016c), the science scores of Missouri's students have improved; however, the science scores of students who attend underperforming schools across the state of Missouri have continued to lag behind those of students who attend schools that met their performance indicators. Across the state of Missouri, 42% of fifth-grade students scored at or above proficient on the state assessment for the 2015-2016 school year. With 42% of its fifth-grade students scoring at or above the proficient range, the state of Missouri is well below its target of having 70% of its students scoring at or above proficient on the science assessment by 2020 (MDESE, 2016c). One factor that may be contributing to the low percentage of fifth-grade students across the state scoring at or above proficient is the disproportionately low science scores of students from low socioeconomic backgrounds (MDESE, 2016c). In 2015, approximately half of the U.S. states had higher national science assessment scores at the fourth-grade level than the state of Missouri had at the fourth-grade level (MDESE, 2016c).

In 2011, the mean score on the national science assessment for Missouri's eighth-

grade students was 156, and the mean score on the national science assessment for eighth-grade students across the United States was 151 (Aud et al., 2013; MDESE, 2016c). Although Missouri's eighth-grade students scored five points higher than eighth-grade students across the United States, Missouri's eighth-grade students did not improve their overall mean score from 2009 (M = 156) to 2011 (M = 156). Further analysis of the 2011 national science assessment scores revealed that only slightly more than one third of Missouri's eighth-grade students scored at or above the proficient range. When comparing Missouri's science assessment scores on the National Assessment of Educational Progress across student subgroups, Aud et al. (2013) found that the overall mean score of African American students was 32 points below that of Caucasian students and that students who were eligible for free and reduced-price lunches had an overall mean score that was 20 points lower than students who were not eligible for free and reduced-price school lunches.

Student achievement in the target school district. The target school district began implementing the PLC model over 10 years ago. Although the PLC model is aligned with the school improvement plan, some schools are struggling to increase student achievement (MDESE, 2016c). Based on the 2015-2016 school year science scores on the state assessment, three of five elementary schools in the target school district failed to meet their academic growth targets, and all five elementary schools received a rating of underperforming from the Missouri Department of Education (MDESE, 2016c). Noteworthy were the 2016 science scores of the target school district's fifth-grade students, as less than 40% of its fifth-grade students scored at or above the proficient range (MDESE, 2016c).

Further analysis of the 2016 state science assessment from the target school

district revealed that 14% of fifth-grade students performed in the below basic range, which is the lowest performance designation, and 45% of fifth-grade students performed in the basic range, which is the second lowest performance designation (MDESE, 2016c). The MDESE (2016c) also noted that 28% of the eighth-grade students from the target school district scored in the below basic range on 2016 state science assessment, and 40% scored in the basic range. Therefore, more than two thirds of the eighth-grade students from the target school district failed to demonstrate grade-level proficiency on the 2016 state science assessment (MDESE, 2016c).

Evidence of Problems in PLCs

Schools and professional organizations endorse PLCs (Dougherty-Stahl, 2015; DuFour & DuFour, 2012; Marzano et al., 2017); however, researchers found that problems existed within PLC models, and these problems impacted the overall effectiveness of PLCs across multiple school settings and multiple grade levels (East, 2015; Higgins, 2016; Krier, 2014; Mulligan, 2016; Stamper, 2015; Stewart, 2017). Higgins (2016) found that high school teachers across one southern state perceived that PLCs could be an effective method to promote academic achievement among students; however, they perceived that their schools lacked the requisite resources and support to implement PLC models effectively. Krier (2014) sought to determine the extent to which the implementation of PLCs impacted the academic achievement of students who attended over 100 Title I elementary, middle, and high schools within one midwestern state. Krier concluded that the implementation of PLCs at these Title I schools had no statistically significant impact on students' academic achievement.

Mulligan (2016) compared teachers' and administrators' perceptions of the five PLC dimensions and concluded that their perceptions differed across two of the

dimensions. Likewise, Stamper (2015) concluded that teachers and administrators from one southern state differed in their perceptions of the significance of the five PLC dimensions. One of the factors that Stamper believed attributed to the discrepancy between the teachers' perceptions and the administrators' perceptions was their incongruent understanding of the PLC construct and its related dimensions. Stewart (2017) found that an ineffectual implementation model at one small urban school district in the southeastern part of the United States, and the school district's inability to implement an effective PLC model, impacted teachers' capacity to improve student achievement. Stewart recommended a broad overhaul of the school's district's current PLC model and the implementation of a PLC model that fostered collegiality between teachers and administrators, empowered educators, and promoted accountability among all stakeholders within the school district.

Researchers identified several factors contributing to problems within PLCs (Cancio, Albrecht, & Johns, 2013; Higgins, 2016; MDESE, 2016c; Mulligan, 2016; Stamper, 2015; Stewart, 2017). Cancio et al. (2013) and Lavian (2015) found that a lack of leadership or inadequate leadership at the school level and low levels of collaboration among teachers were predictive factors of an ineffective PLC model. Cancio et al. underscored the importance of school leaders crafting a mission for the PLC and fostering an environment that was conducive to improving both student learning and teacher practices. Lavian noted that a lack of collaboration among teachers had a negative effect on systematic efforts to promote effective pedagogical practices and student achievement. Almanzar (2014) concluded that low teacher morale contributed to problems within PLCs. Almanzar found that teachers believed that they did not have the requisite resources to improve student achievement. DuFour and DuFour (2012) cited the

inadequate resources as well as the construct of resistance to change among teachers and administrators as a contributory factor to ineffective PLCs.

Transformational leadership. Administrators play an integral role in developing and sustaining the PLC (DuFour & DuFour, 2012; Fullan, 2014). Sustaining a PLC is a continuous process and requires ongoing commitment of its members, and the guidance of a transformational leader is required to foster a collaborative school climate (DuFour & DuFour, 2012). To transform a school culture, a principal must be a transformational leader (DuFour & DuFour, 2012). Without strong leadership, the constructs of the PLC can be compromised and impact the effectiveness of the initiative. Administrators and teaching staff need to commit to the culture of the school with fidelity of implementation (DuFour & DuFour, 2012; Fullan, 2014).

Within effective PLCs, administrators identify the professional needs of the community members (DuFour & DuFour, 2012). Principals provide resources, conditions, and professional-development opportunities that meet the professional learning needs of teachers and identify instructional strategies that will challenge all students (DuFour & DuFour, 2012). Administrators share the decision-making process with community members and foster teacher leaders in school improvement programs and initiatives (DuFour & DuFour, 2012; Fullan, 2014). Olivier and Huffman (2016) concluded that developing effective school-level leadership skills was critical to the success of the PLC model. The leadership skills they highlighted included the ability to craft a vision and mission for the school, the ability to communicate expectations, and the ability to model the school's overarching vision and mission.

Shared and supportive leadership. In addition to transformational leadership, shared and supportive leadership represents an essential component of a successful PLC

(Parks, 2014). Shared and supportive leadership shapes the way teachers engage in PLCs (DuFour & DuFour, 2012; Parks, 2014). Carpenter (2015) found shared and supportive leadership was essential to the climate and teacher morale within the PLC. Carpenter further noted that school leaders who removed themselves from the continuous improvement cycle created a climate that was unconducive for sharing divergent perspectives and ideas among teachers. Teachers, consequently, withdrew from collaborating, which hindered the overall effectiveness of the learning community. Carpenter recommended that administrators work with teachers to develop policies and procedures to guide the PLC and provide leadership structure.

Parks (2014) investigated elementary teachers' perceptions of the construct of shared and supportive leadership within their PLCs. Parks included a cross-section of teachers from elementary schools across the western United States. The subscale that Parks used to investigate teachers' perceptions of shared and supportive leadership was composed of 11 statements, and teachers ranked each statement on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Parks found that the overall sample mean score for all 11 statements was approximately 3.00, and, therefore, elementary teachers perceived that they received shared and supportive leadership for PLCs.

Parks (2014) also compared teachers' perceptions of the construct shared and supportive leadership within PLCs based on their years of experience. Parks found teachers who had 16 years or more years of experience had statistically significantly lower mean scores than those with 0 to 15 years of experience. Parks provided a couple of reasons for the statistically significant difference between the two groups' mean scores. Parks surmised that teachers with more than 16 years of experience had less exposure to high-stakes testing than those with fewer years of experience and, therefore,

lacked a clear understanding of the positive impact that PLCs had on both student learning and teacher instruction.

Educator collaboration. As a mechanism of communication, collaboration among teachers is the foundation for promoting student success and effective teaching practices including PLCs (DuFour & DuFour, 2012). By collaborating with other professionals, teachers are able to engage in interactive dialogue regarding instructional practices and to share professional resources (Higgins, 2016). Fullan (2014) noted that a school culture with supportive collaborative conditions allows PLC members to observe peer practices and to reflect on instruction. According to Marzano et al. (2017), teacher collaboration is a key component of PLCs. For collaboration to affect change, schools must embed purposeful and structured collaboration in every aspect of their school culture (Schneider, 2015). Collaboration is an opportunity for teachers to engage in active problem solving and to assess students' academic readiness, deficits, and strengths (DuFour & DuFour, 2012).

Within the constructs of PLCs, collaborative teams are composed of administrators, teachers, counselors, librarians, school social workers, and other stakeholders (DuFour & DuFour, 2012). A school-based PLC may include several collaborative teams, wherein school administrators can use different grouping criteria when formulating collaborative teams, including grade level, subject area, and the needs and goals of the school (Cancio et al., 2013). D'Auria (2015) stated, "The ability to develop and support high-functioning teams school-wide is essential to ensuring improved and inspired learning for all learners-adults and children" (p. 54). Further, Edmonson (2013) asserted highly effective collaborative teams within PLCs possess the skills to problem solve difficult tasks and challenges.

Researchers have identified barriers that adversely impacted collaboration within PLCs (East, 2015; Finley, 2013; Higgins, 2016). Higgins (2016) found that a lack of understanding of the overarching purpose of PLCs and of common planning time negatively impacted the ability of high school teachers from one southern state to engage in authentic collaboration. East (2015) used a mixed-methods design to investigate various aspects of PLCs at low performing schools in one southern state. Similar to Higgins (2016), East found that a lack of common planning time inhibited teachers' ability to collaborate. The teachers further cited the related challenges of working in low performing schools and that their planning time was often spent completing paperwork, meeting with parents, and planning lessons. A lack of time to collaborate was a recurrent theme that emerged in Stewart's (2017) study. Stewart recommended providing teachers with other opportunities to collaborate during the week and not infringing on their planning time.

According to Finley (2013), a disconnect between teachers' practices and their application of these practices adversely impacted collaboration in PLCs. Teachers reported they were structurally implementing PLC practices but not embedding these practices in their team work. They also focused on surface-level practices, did not engage in substantive dialogue, and failed to promote teacher accountability. Similar to Higgins (2016) and East (2015), Finley found teachers had limited opportunities to collaborate. Finley believed teachers could overcome this barrier by communicating through web-based video conferencing software such as Skype and web-based programs such as wikis. Teachers recognized the capacity of web-based conferencing software to promote collaboration in PLCs; however, web-based conferencing tools should not supplant face-to-face interactions. Finley recommended giving teachers a common planning time to

collaborate. Fullan (2014) stressed that a school culture with supportive collaborative conditions allows PLC members to observe peer practices, reflect on instruction, and share their pedagogical practices.

Collaboration among general and special education teachers. Collaboration among general and special education teachers is paramount when addressing the distinct learning needs of students with disabilities (Jones, Youngs, & Frank, 2013). General education and special education teachers must collaborate regularly to discuss students' individual education plans, accommodations, modifications, differentiated instruction, and overall academic progress (Jones et al., 2013; Kurth & Keegan, 2012). Special education teachers can be an invaluable professional resource to general education teachers by helping them adapt their lesson plans, integrate appropriate problem-solving strategies, and improve classroom management (Jones et al., 2013; Kurth & Keegan, 2012; McLeskey, Waldron, & Redd, 2014; Sorani-Villanueva, McMahon, Crouch, & Keys, 2014).

Although researchers highlighted the importance of collaboration among general and special education teachers (Kurth & Keegan, 2012), special education teachers feel disconnected from their regular education peers, which impacts their willingness to collaborate and marginalizes their importance within the school culture (Jones et al., 2013). Robbins (2013) identified three barriers that impacted collaboration between general and special education teachers: a lack of common planning time, topics not conducive to collegiality, and coteachers attending different PLCs. Robbins further noted that teacher collaboration fostered the development of cohesive relationships and shared planning time was essential to planning instruction. Robbins urged school administrators to give coteachers their teaching assignments for the subsequent school year prior to the

start of summer vacation because general and special education teachers could collaborate during the summer break.

Teacher morale. Teacher morale impacts the effectiveness of the PLC (Basileo, 2016; Owen, 2016). Basileo (2016) found a positive association between the level of teacher morale and students' academic achievement and their willingness to display positive behaviors and between the level of teacher morale and the overall effectiveness of the school. Owen (2016) used a case-study design to investigate the psychological well-being of teachers in PLCs. Owen noted that teachers formulated co-teaching partnerships, developed lesson plans, and engaged in critical self-reflection of their instructional practices. Owen found that teachers were able to increase their pedagogical expertise and improve student outcomes by developing positive collegial relationships with their peers. Teachers also reported increased levels of enthusiasm because their collaborative efforts were catalysts for improving student achievement. Owen concluded that PLCs need to go beyond working in teams and create an environment that allows teachers to develop a sense of purpose. Well-functioning PLCs will foster positive relationships among colleagues, foster a passion for teaching, and promote a positive learning environment for both teachers and students (Marzano et al., 2017).

Lambersky (2016) found administrators' behaviors influenced teacher morale, commitment, burnout, stress, self-efficacy, and collective efficacy. Lambersky also concluded that school leaders who respect teachers' capabilities, acknowledge teachers' commitment, foster a safe learning environment, maintain a visible presence in the school, engage in reciprocal communication, and adhere to a school's vision and mission positively affected both the teachers' emotional well-being and the overall school community. Lambersky also noted that principal behaviors were key factors in improving

teachers' morale and their job satisfaction.

Resistance to change. Administrators and teachers must commit to the culture of the school by implementing the learning community model with fidelity (DuFour & DuFour, 2012; Marzano, 2013). Resistance to change among staff is one of the most reported issues schools encounter within their PLC constructs. Resistance to change within PLCs can impede the benefits of the framework (Carpenter, 2015). Changing the mindset of some PLC members can be a daunting task. However, transforming the culture of a school is the most powerful way to influence those who are resistant to adopt a school culture that promotes positive change (Marzano et al., 2017).

Resistance to change can manifest in conflicts and disputes among PLC members (Marzano, 2013). According to Marzano et al. (2017), conflicts and disagreements are inevitable during the change process because PLC members have varying perspectives and personality traits. In fact, Marzano et al. believed conflict was an essential part of the change process; however, they cautioned that unresolved conflict hindered the school improvement process. Effective leaders recognize that disagreements will occur within PLCs and seek to find a common ground. Minimizing conflict in PLCs can help build stronger collaborative teams. Finley (2013) described the behaviors of those who were resistant to change, including failing to complete tasks and being unprepared for meetings. Finley believed administrators should enlist a neutral party, such as a teacher from another grade level, to facilitate and mediate the conflict within the PLC team.

Inability to make data-based instructional decisions. Using assessment data to guide instructional decisions is a significant component of a PLC's vision for school improvement. Sims and Penny (2014) used a case-study design to investigate the perceptions of high school teachers who were part of their schools' PLC data teams. They

found that the PLC data teams had a negligible impact on student outcomes because administrators and teachers were disengaged in the PLC process. Sims and Penny further noted that team members lacked a clear understanding of how to assist their students and felt unprepared to make data-driven decisions. Using data that did not provide insight into students' individual strengths and weaknesses was problematic. Teachers also believed their participation in the PLC constrained their creativity when teaching and lesson planning. Sims and Penny recommended increasing teachers' capacity to make data-driven decisions.

Farley-Ripple and Buttram (2014) agreed with Sims and Penny (2014) and also found that teachers lacked the ability to make data-based instructional decisions. Farley-Ripple and Buttram believed that mandates and policies created opportunities for educational change and that compliance was not conducive to developing effective collaborative efforts that impacted teacher knowledge and student learning. The authors recommended that district leadership should focus on developing a strong vision and providing collaborative opportunities for teachers to make data-based instructional decisions.

Researchers attributed teachers' inability to make data-based instructional decisions to the data-rich, information-poor syndrome (Farbman, Goldberg, & Miller, 2014). Within education, this syndrome is a condition in which teachers are inundated with student data but lack the wherewithal to disseminate, analyze, and interpret the student data (Mokhtari & Consalvo, 2016). To ensure that this syndrome does not hinder the efforts of PLC teams, Salika (2017) believed schools should focus on identifying patterns and trends within the data and use specific questioning strategies that facilitated the ability of teachers to apply the data to improve teacher practices and student learning.

Farbman et al. (2014) and DuFour and Fullan (2013) underscored the importance of teachers strategically analyzing student data and identifying trends and patterns within the data to enhance their instructional practices and improve student learning. By increasing teachers' capacity to analyze student data, schools enhance teachers' ability to address their students' academic needs (Hattie, 2012).

Lack of supportive conditions: Time and resources. Researchers investigated the impact that supportive conditions within the school building had on PLC communities (Robbins, 2013; Sims & Penny, 2014). Sims and Penny (2014) stressed that common planning time was an effective means for implementing, developing, and sustaining an effective PLC and not having a common planning time resulted in the PLC focusing on reviewing student data rather than on developing instructional strategies to enhance student learning. Researchers noted that a lack of supportive conditions such as common planning time was a hindrance to teachers' ability to engage in collective inquiry and to analyze student data (Robbins, 2013; Sims & Penny, 2014). Fullan (2014) suggested integrating weekly collaborative planning times into schools' master schedules and scheduling both early release and in-service days for faculty collaboration.

Resources were another supportive condition that researchers investigated (Farley-Ripple & Butram, 2014; Hubbard, Datow, & Pruyn, 2013). Hubbard et al. (2013) found that teachers lacked the resources to align textbooks and assessments, and, consequently, a disconnect existed between curriculum and pedagogy. This disconnect had a negative impact on teachers' ability to make data-based lesson planning and instructional decisions in both social studies and science. Hubbard et al. found that despite the disconnect between curriculum and pedagogy, the school's administration tracked data and shared information with teachers to demonstrate the need to utilize data-

driven decisions across the curriculum.

Science curriculum and PLCs. Jones, Gardner, Robertson, and Robert (2013) investigated the PLC experiences of science teachers in one urban school district. Jones et al. noted that only science teachers were part of the PLC. The teachers believed the PLC was a venue for sharing instructional strategies, for learning others' perspectives, and for increasing their ability to teach the science curriculum. Some of the challenges that teachers experienced during the PLC were the inability of the administrator to adhere to an agenda, stringent time limits for meetings, colleagues not following the managing protocol. Teachers concluded that these challenges hindered teachers' professional growth and the culture of change in a learning organization. Jones et al. found that participating in a PLC was more beneficial for novice teachers than for veteran teachers.

Mintzes, Marcum, Messerschmidt-Yates, and Mark (2013) investigated the impact of a sustained PLC teacher self-efficacy to teach science. Mintzes et al. used Bandura's social learning theory as the theoretical framework and included 116 inservice elementary school teachers. Participants revealed they were reluctant to teach science prior to participating in the PLC, citing time constraints and their inability to master the science curriculum. Participants reported that collaboration with colleagues during the PLC meetings had a positive impact on their ability to design, implement, and assess science lessons. They also perceived an increased sense of empowerment in their capacity to teach hands-on activities and higher self-efficacy levels than they had before participating in a PLC.

Solutions to the Problems Within PLCs

Prior research supports the ability of PLCs to provide a powerful infrastructure for reculturing schools (Marzano et al., 2017; Mindich & Lieberman, 2012; Robbins, 2013).

Reculturing involves using inquiry to improvement instructional practices, adopting a collaborative mindset, and increasing the scope of responsibility for both teachers and administrators (Robbins, 2013). A PLC is a school improvement mechanism that allows educators to reflect collaboratively on their instructional practices, to assess student data, and to promote student achievement (Mindich & Lieberman, 2012). The process of becoming an effective PLC begins with reculturing the school and changing the mindset of its members (Marzano et al., 2017).

Implementing effective PLCs. Implementing an effective PLC is a nonlinear process (Marzano et al., 2017). Eaker and Keating (2012) identified 10 steps to implement and sustain a successful PLC. The first step is PLC members must acknowledge that collaboration is a mechanism for understanding issues, solving problems, and making decisions. The second step is PLC members must have an understanding of the constructs and dimensions of an effective learning community. The third step is PLC members develop and faithfully adhere to the shared mission, vision, values, and goals of the PLC. The fourth step is the members must have a keen understanding of the PLC's mission: to improve student learning. The fifth step is PLC members must craft a vision statement that conveys a culture of excellence. The vision statement is a description of what the PLC members believe is a culture of excellence in relation to school climate, leadership, and curriculum.

The sixth step is PLC members must integrate the vision statement throughout all aspects of the PLC and budget, curriculum, initiatives, and processes. The seventh step is members must link the values of the PLC to the school's vision statement and model the school's vision statement through their attitudes and behaviors. The eighth step is the school's improvement plan must be the foundation for developing and implementing

goals, and PLC members must monitor and assess both short-term and long-term goals and celebrate their success in achieving these goals. The ninth step is the school improvement plan must be data driven and include research-based strategies and practices. To develop an effective school improvement plan, PLC members must engage in collective inquiry regarding best practices and base data-driven decisions on student learning outcomes. The final step is understanding that developing and sustaining a successful PLC is an incremental process wherein PLC members must focus on improving student learning every day.

Transformational leadership. Transformational leadership is an effective model for solving problems within PLCs because those who model the overarching characteristics of transformational leadership act as facilitators who guide others into embracing the vision and goals of the organization (Marzano et al., 2017). Transformational leaders are charismatic individuals who have the innate ability to meet the needs of members of the organization, to foster creativity across all levels of the organization, and to solve problems that hinder organizational growth (DuFour & DuFour, 2012). They challenge the teachers in the PLC to be accountable for their students' growth (DuFour & DuFour, 2012). Transformational leaders also motivate individuals to collaborate to solve problems (DuFour & DuFour, 2012; Marzano et al., 2017). Finally, transformational leaders foster climate of collective inquiry and innovation (Edmonson, 2013).

Utilizing relevant data. To combat the data-rich, information-poor syndrome and the lack of relevant data, PLC members need to form collaborative teams and "gather defensible and dependable evidence from many sources and hold collaborative discussions with colleagues and students about this evidence, thus making the effect of

their teaching visible to themselves and to others" (Hattie, 2012, p. 19). Utilizing relevant data assists collaborative teams in identifying, analyzing, evaluating, and reflecting on the needs of their students and on their instructional practices (Fullan, 2014; Owen, 2016). Collaborative teams can effectively utilize data to create rigorous, attainable, and measurable goals that are inextricably linked to the desired outcomes of the PLC. Collaborative teams can use benchmarking, common assessments, and other relevant data to develop specific, measurable, attainable, realistic, and timely goals (Sims & Penny, 2014). The teams must engage in action research and have indepth conversations about improving student achievement and promoting innovative instructional practices (Sims & Penny, 2014).

Science, technology, engineering, and math. Fulton and Britton (2011) stated, "Teaching in science, technology, engineering, and math is more effective and student achievement increases when teachers join forces to develop strong professional learning communities in their schools" (p. 4). The authors conducted a 2-year study synthesizing PLCs and research on science, technology, engineering, and math and found that instruction in science, technology, engineering, and math is more effective and increases student achievement when teachers are engaged in an effective PLC. The National Commission on Teaching and America's Future (2012) advised policy makers to provide a platform for educators to create a culture of collaboration within PLCs to improve teaching in science, technology, engineering, and math. Researchers underscored the importance of stakeholders understanding the implications of education in science, technology, engineering, and math to America's economic growth and global competitiveness (Fulton & Britton, 2011; National Commission on Teaching and America's Future, 2012). America's 20-year decline in science achievement is further

evidence of the need for school districts to align their PLC constructs with professional development in science, technology, engineering, and math (Fulton & Britton, 2011).

Teacher professional development. According to DuFour, DuFour, Eaker, Many, and Mattos (2016), a PLC's goal is to provide teachers to address the needs of students through collaboration. Mindich and Lieberman (2012) found that schools with effective PLCs allowed teachers to select their learning opportunities. Supporting the theory of Mindich and Lieberman, Akiba and Liang (2016) conducted a longitudinal study in which they investigated the effect of teacher professional development on student achievement. They collected survey data from 467 middle school mathematics teachers in 91 schools and used students' mathematics scores from the Missouri assessment program to measure student achievement. Akiba and Liang found that teacher-centered collaborative activities (e.g., teacher collaboration and informal communication) were more effective than teacher-centered professional development (e.g., university courses and individual learning).

Akiba and Liang (2016) also found a slightly positive association between student achievement on the Missouri assessment program and the extent to which teachers collaborated with each other, attended professional conferences, and engaged in informal communication about teaching mathematics. Akiba and Liang concluded that the collaborative learning activities and collective inquiry that occurred among teachers during the PLCs were mechanisms for sharing pedagogical practices. Mindich and Lieberman (2012) suggested that school districts promote student achievement by providing professional development based on teacher-centered collaboration and research-based learning.

Preservice teacher education. Engaging in a PLC can be difficult for novice

teachers; however, teacher education programs can prepare preservice teachers to participate in a PLC before they begin their teaching careers. Hoaglund, Birkenfeld, and Box (2014) conducted a study that included preservice teachers from Samford University who participated in a year-long learning community model as part of their teacher education program. The purpose of the year-long initiative was to develop their collaborative skills within the context of a PLC. After completing a self-rating scale based on state teaching standards and indicators, each preservice teacher completed a professional learning plans. University faculty then placed preservice teachers in groups based on their self-identified weaknesses. Faculty facilitated the group discussions and provided resources for the preservice teachers.

Hoaglund et al. (2014) found that the overall impact of the initiative was positive when preservice teachers learned how to analyze data, problem solve, and examine student work. Faculty mentors also met with teacher candidates throughout the academic year to discuss and monitor their growth. In addition to participating in PLCs at the university, teacher candidates participated in PLCs in partnering schools. Hoaglund et al. believed the experience allowed preservice teachers to engage with practitioners in a school setting. Hoaglund et al. recommended that educators participate in teacher education programs that focus on the skills needed to teach in a 21st-century school setting.

Attributes of a Successful PLC

DuFour et al. (2016) found that the attributes of a successful PLC were collaboration, a clear focus on student learning, shared leadership, continuous learning and professional development, celebration of successes, persistence among members, a succinct mission statement, and a clear vision statement.

Collaboration. The first attribute, collaboration, is significant to the success of learning community because the ability of teachers to work together is paramount to the school improvement process (DuFour & DuFour, 2012; Owen, 2014). Collaboration is an opportunity for PLC members to establish daily norms and routines. Collaborative planning times are scheduled throughout the school day to share teaching practices, review student progress, and engage in problem solving (DuFour et al., 2016).

Focus on student learning. A clear focus on student learning is the second attribute of a successful PLC (D'Auria, 2015). Members focus on student learning by clearly identifying the proactive behaviors that will promote student achievement (Owen, 2014).

Shared leadership. Shared leadership is the third attribute (DuFour & Fullan, 2013). The administrator's role in the PLC community is to promote, protect, and defend the school's vision and values and to encourage members to remain committed to the community (DuFour & Fullan, 2013). Administrators are viewed as leaders of leaders because they promote opportunities for growth by delegating leadership roles for all members (McLeskey et al., 2014). The shared values that the PLC establish have a clear connection to the school's vision; however, shared values are not enough, and therefore, the PLC must establish goals to measure the school's performance (DuFour et al., 2016).

Continuous learning and professional development. Continuous learning and professional development by administrators and teachers is the fourth attribute (DuFour & DuFour, 2012; Owen, 2014). Administrators and teachers pursue a direct and explicit purpose for student learning (DuFour et al., 2016; McLeskey et al., 2014; Owen, 2014). During collaborative activities and professional development, members of the PLC analyze and discuss assessment data for insight into students' strengths and areas of need

(Owen, 2014).

Celebration of success and persistency among members. The fifth attribute is celebration of successes. Schools recognize and celebrate the achievements of both students and teachers (DuFour & DuFour, 2012). Persistence among members is the sixth attribute of a successful PLC (DuFour et al., 2016). Reform efforts in traditional schools are temporary and inconsistent; however, the initiatives of a PLC include permanent and sustaining changes to the school's culture and persistence among members has an integral role in establishing and sustaining these changes (Owen, 2014). D'Auria (2015) concluded, "Continuous improvement requires a process by which educators develop habits and routines for assessing their effect; they must learn from what is working and adjust their practice accordingly" (p. 54). Members of a PLC are persistent and committed to the re-culturing school's community (DuFour et al., 2016).

Succinct mission and clear vision statement. The next attribute, a succinct mission and clear vision statement, is a guide for the learning community (DuFour & DuFour, 2012). The mission statement includes what students will learn, how they will learn, and how the school will respond to its struggling students (Anrig, 2013). This mission statement should include the methods the school will use to address hindrances to the learning process (Anrig, 2013). The final attribute, a clear vision statement, is a series of research-based statements focusing on the goals of the school and serving as an outline for school improvement (DuFour et al., 2016).

Summary

The PLC model is a school reform that promotes team collaboration, teacher accountability, shared leadership, collective creativity, a supportive environment, and continuous school improvement (DuFour & DuFour, 2012; Huffman et al., 2015; Owen,

2014). Teachers within PLCs are accountable for student performance through a results-orientated approach (DuFour et al., 2016). Administrators and teachers analyze both internal and external data sources (Huffman et al., 2015). Internal data sources include unit tests, reading benchmarks, and math scrimmages while external data sources include the results of summative and standardized assessments (Huffman et al., 2015; McLeskey et al., 2014).

Anrig (2013) found that analyzing internal and external data was an effective means for making data-based instructional decisions. By making data-based decisions instructional decisions, teachers are able to target their students' academic deficits and to develop a strategic plan to provide the students individualized support (Sorani-Villanueva et al., 2014). DuFour and Fullan (2013) proposed that a PLC was a mechanism for acquiring pedagogical strategies, developing a deeper understanding of content knowledge, and promoting a strong sense of student-centered instruction (McLeskey et al., 2014).

The PLCs are at the forefront of educational reform (Marzano et al., 2017). Across the United States, school districts are adopting the PLC framework to address the needs of underperforming schools (Basileo, 2016; Huffman et al., 2015) The primary goal of PLCs is to reculture schools into a climate of collaboration, collective inquiry, shared knowledge, and problem solving (Carpenter, 2015; Owen, 2016). The collaborative culture of PLCs fosters an environment for high-performing teams that are committed to increasing student achievement through data-driven instructional practices (Carpenter, 2015). The implementation of PLCs is a nonlinear process and requires all community members commit to the constructs of the PLC model (Marzano et al., 2017). Stakeholders are guided by the values, vision, and goals of the school (Marzano et al.,

2017). The PLCs are not a program but a process focusing on teaching and learning throughout the school year to address the individual challenges and issues within the community (Stewart, 2017).

Research Questions

The following research questions were established according to the six tenets of the PLC framework, which include (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions–relationships, and (f) supportive conditions–structures:

1. Do teachers' perceptions of shared and supportive leadership vary across the five elementary schools within the same school district?

2. Do teachers' perceptions of shared values and vision vary across the five elementary schools within the same school district?

3. Do teachers' perceptions of collective learning and application vary across the five elementary schools within the same school district?

4. Do teachers' perceptions of shared personal practice vary across the five elementary schools within the same school district?

5. Do teachers' perceptions of supportive conditions–relationships vary across the five elementary schools within the same school district?

Do teachers' perceptions of supportive conditions–structures vary across the five elementary schools within the same school district?

Chapter 3: Methodology

The purpose of this research study was to determine if teachers' perceptions of the six tenets of the PLC framework varied across five elementary schools within a suburban school district located in the midwestern part of the United States. This chapter describes this study's methodology, participants, data-collection instruments, and procedures for conducting the study and analyzing the data.

Participants

The target school district has five elementary schools. The demographics of the student population and teaching staff at each school varied significantly, as did the years of teaching experience of the staff at each school. Each participant taught at schools using the PLC constructs. The target population involved fifth-grade elementary teachers who administered the Missouri assessment program in science. The researcher is a special education teacher at one of the five elementary school within the school district. The researcher did not serve in the role of supervisor to any of the potential participants. The school district's superintendent and school district administration gave the researcher permission access to the teachers and school sites. In the subsequent paragraphs, the researcher describes the demographics of each school.

Sampling procedure. The researcher used a convenience sampling procedure to select participants for this study. Convenience sampling is a nonprobability sampling technique that researchers use when they select participants who are easily accessible (Creswell, 2014a, 2014b; Suen, Huang, & Lee, 2014). The researcher concluded that a convenience sampling procedure was appropriate because the 40 target elementary schools and respective schools were easily accessible.

Demographics of target schools. School A is an elementary school that serves

approximately 361 students in kindergarten to Grade 5. The racial demographics of the student population are as follows: (a) African American = 42.1%, (b) Caucasian = 30.7%, (c) Hispanic = 15.8%, and (d) multiracial = 9.4%. The percentage of students receiving free or reduced lunch is 80.3. Approximately 54% of School A's teaching staff have earned a master's degree or higher, and all of the teachers have professional teaching licenses and are highly qualified according to the criteria set forth by the MDESE (2016c). The mean number of years of teaching experience among the staff is 14.2, and the teacher-to-student ratio is 1:18.

School B is an elementary school that serves approximately 421 students in kindergarten to Grade 5. The racial demographics of the student population are as follows: (a) African American = 48.1%, (b) Hispanic = 28.0%, (c) Caucasian = 16.9%, and (d) multiracial = 9.4%. The percentage of students receiving free or reduced lunch is 90.3. Approximately 86.2% of School B's teaching staff have earned a master's degree or higher, 96% have professional teaching licenses, and 98% are highly qualified according to the criteria set forth by the MDESE (2016c). The mean number of years of teaching experience among the staff is 15.6, and the teacher-to-student ratio is 1:18.

School C is an elementary school that serves approximately 435 students in kindergarten to Grade 5. The racial demographics of the student population are as follows: (a) African American = 48.9%, (b) Hispanic = 27.3%, (c) Caucasian = 25.6%, and (d) multiracial = 6.7%. The percentage of students receiving free or reduced lunch is 80.6. Approximately 70.4% of School C's teaching staff have earned a master's degree or higher, and all of the teachers have professional teaching licenses and are highly qualified according to the criteria set forth by the MDESE (2016c). The mean number of years of teaching experience among the staff is 14, and the teacher-to-student ratio is 1:18.

School D is an elementary school that serves approximately 772 students in kindergarten to Grade 5. The racial demographics of the student population are as follows: (a) African American = 38.1%, (b) Hispanic = 27.3%, (c) Caucasian = 25.6%, and (d) multiracial = 6.7%. The percentage of students receiving free or reduced lunch is 80.6. Approximately 67.7% of School D's teaching staff have earned a master's degree or higher, 98% of the teachers have professional teaching licenses, all of the teachers are highly qualified according to the criteria set forth by the MDESE (2016c). The mean number of years of teaching experience among the staff is 13.4, and the teacher-to-student ratio is 1:18.

School E is a Title I elementary school that serves approximately 441 students in kindergarten to Grade 5. The racial demographics of the student population are as follows: (a) African American = 49.9%, (b) Hispanic = 20.2%, (c) Caucasian = 20.0%, and (d) multiracial = 9.1%. The percentage of students receiving free or reduced lunch is 64. Approximately 54% of School A's teaching staff have earned a master's degree or higher, and all of the teachers have professional teaching licenses and are highly qualified according to the criteria set forth by the MDESE (2016c). The mean number of years of teaching experience among the staff is 13.1, and the teacher-to-student ratio is 1:17.

Instruments

The researcher used the revised version of the PLC assessment for the data collection (see Appendix). Participants completed the survey in one single phase (Creswell, 2014b). According to Hipp and Hoffman (2010), the instrument provides data on school-level practices within PLCs. The assessment contains 52 questions and uses a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The researcher obtained permission to use the instrument. The researcher used the instrument

to determine and compare fifth-grade teachers' perceptions of the following six practices: (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions–relationships, and (f) supportive conditions–structures (Hipp & Huffman, 2010). The alpha reliability coefficients for the factored subscales are as follows: (a) shared and supportive leadership, $\alpha = .94$; (b) shared values and vision, $\alpha = .92$; (c) collective learning and application, $\alpha = .91$; (d) shared personal practice, $\alpha = .87$; (e) supportive conditions–relationships, $\alpha = .82$; and (f) supportive conditions–structures, $\alpha = .88$ (Hipp & Huffman, 2010).

Procedures

Design. The researcher used a one-time point, descriptive research design. According to Creswell (2014a), descriptive designs are appropriate when researchers seek to describe the general characteristics of the population under investigation. Creswell (2014b) noted that descriptive research can either be qualitative or quantitative because researchers provide either a numerical or a written description of the characteristics of a segment of the population. The researcher concluded that a convenience sampling procedure was appropriate because the five target elementary schools were easily accessible. The researcher conducted this study in a suburban school district in the midwestern United States and used a quantitative methodology to collect, analyze, and provide an interpretation of the survey data. The quantitative approach allowed the researcher to examine teachers' perceptions of the PLC constructs, identify themes, and determine differences across the five elementary schools (Creswell, 2014b).

Data collection. The data-collection process had three distinct phases. After completing the three distinct phases, the researcher analyzed the survey data. The

following is a description of each data-collection phase:

1. Prior to collecting data, the researcher obtained permission to recruit participants from the school district's superintendent and the schools' principals. The researcher obtained Institutional Review Board approval from Nova Southeastern University. Upon receiving permission from the school district's administrators and receiving university approval, the researcher recruited participants (Creswell, 2014a; O'Dwyer & Bernauer, 2014).

2. To solicit participation in this study, the researcher enlisted district instructional coaches to inform the teachers about the study. The researcher attended a grade-level meeting at each school site to distribute the study's consent forms and provide additional information about the study.

3. Upon receiving the consent forms, the researcher sent an email to potential participants' school email accounts. In the email, the researcher provided them with details about the study and the timeline for completing the survey. The researcher sent a Survey Monkey link to access the PLC instrument. Participants had 2 weeks to complete the survey. Participants who had not completed the PLC instrument received a follow-up email after 5 days and then another after 10 days. The researcher kept all consent forms and other related documentation in a secure locked filing cabinet at the researcher's school site. The researcher was the only person with a key to this filing cabinet.

Data analysis. First, the data were exported from Microsoft Excel into Version 24 of the Statistical Package for the Social Sciences, which was the program used to analyze the data and ultimately answer the research questions. Next, Cronbach's reliability analyses were conducted to determine whether the various survey items loaded reliably ($\alpha > .70$) onto their subsequent scales. The researcher found that all of the scales were

reliable: shared and supportive leadership, α = 87; shared values and vision, α = 92; collective learning and application, α = 89; shared personal practice, α = 78; and supportive conditions–structures, α = .93. The researcher did not conduct a reliability analysis for supportive conditions–relationships as only one survey item measured that tenet.

Next, new variables were created in the statistical software program for all of the subscales that yielded an alpha coefficient greater than .70. Lastly, the means, standard deviations, minimum scores, and maximum scores were determined for each survey construct as they corresponded to the research questions. These descriptive analyses were run for teachers across all schools (N = 12) followed by separate analyses for teachers at each school (i.e., School A, School B, School C, School D, and School E). The survey responses ranged from 1 (*strongly disagree*) to 4 (*strongly agree*), with scores that were close to 4.0 indicating a high level of agreement. It is important to interpret the findings with caution given the small, uneven sample size and given the fact that the researcher compared mean values and did not determine if mean values were statistically different from each other.

The researcher used participants' responses to Survey Items 1, 2, 8, and 9 to answer the first research question. Participants' responses to Survey Items 14, 15, 16, 17, and 20 provided the data to answer the second research question. Participants' responses to Survey Items 23, 24, 26, 28, and 29 provided the data to answer the third research question. Participants' responses to Survey Items 31, 32, 33, and 35 provided the data to answer the fourth research question. Participants' responses to Survey Item 42 provided the data to answer the fifth research question. Participants' responses to Survey Items 43, 44, 45, 46, 47, and 52 provided the data to answer the sixth research question.

The researcher examined the data for accuracy, missing values, and outliers in the PLC assessment data (Creswell, 2014a). Next, the researcher uploaded the data into a SPSS statistical software program for analysis (Creswell, 2014a). The researcher screened the data for accuracy by calculating ranges, minimums, and values (Creswell, 2014b; O'Dwyer & Bernauer, 2014). The researcher omitted from the analysis the results of participants who did not complete at least 50% of the survey items. The researcher reported the findings through a balance of description, analysis, and interpretation of the results (Creswell, 2014b; O'Dwyer & Bernauer, 2014). The researcher also included a discussion of the interpretation of the statistical findings. According to O'Dwyer and Bernauer (2014), interpretation "requires a creative leap based on our own experience, ingenuity, creativity, and critical thinking that represents our 'take' on what we have found" (p. 14).

Chapter 4: Results

Introduction

The purpose of this research study was to determine if teachers' perceptions of the six tenets of the PLC framework varied across five elementary schools within a suburban school district located in the midwestern part of the United States. The six tenets the researcher investigated were as follows: (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions–relationships, and (f) supportive conditions–structures across five elementary schools within the same school district.

Findings for Research Question 1

Do teachers' perceptions of shared and supportive leadership vary across the five elementary schools within the same school district? The teachers' perceptions of shared and supportive leadership across all five schools resulted in a mean of 2.63, which was below the mean scores at School A (M = 3.60), School B (M = 2.70), and School C (M = 3.07). Table 1 shows the mean scores for perceived shared and supportive leaderships were slightly lower at School D (M = 2.07) and School E (M = 2.40).

Table 1

Descriptive Statistics for Shared and Supportive Leadership

Item	No. teachers	Minimum	Maximum	Mean	*SD*
All schools	12	1.00	3.60	2.63	0.69
School A	1	3.60	3.60	3.60	0.00
School B	2	2.40	3.40	2.70	0.99
School C	3	2.60	3.60	3.07	0.50
School D	3	1.00	2.60	2.07	0.92
School E	3	2.40	2.40	2.40	0.00

Findings for Research Question 2

Do teachers' perceptions of shared values and vision vary across the five elementary schools within the same school district? The teachers' perceptions of shared values and vision across all five schools resulted in a mean of 2.62, which was below the mean scores at School A (*M* = 3.20), School B (*M* = 2.90), and School C (*M* = 3.07). Table 2 shows the mean scores for perceived shared values and vision were slightly lower at School D (*M* = 2.07) and School E (*M* = 2.33).

Table 2

Descriptive Statistics for Shared Values and Vision

Item	No. teachers	Minimum	Maximum	Mean	*SD*
All schools	12	1.40	3.60	2.62	0.64
School A	1	3.20	3.20	3.20	0.00
School B	2	2.40	3.40	2.90	0.71
School C	3	2.80	3.60	3.07	0.46
School D	3	1.40	2.80	2.07	0.70
School E	3	2.00	2.80	2.33	0.41

Findings for Research Question 3

Do teachers' perceptions of collective learning and application vary across the five elementary schools within the same school district? The teachers' perceptions of collective learning and application across all five schools resulted in a mean of 2.52, which was below the mean scores at School A (*M* = 2.75), School B (*M* = 2.75), and School C (*M* = 2.67). Table 3 shows the mean scores for collective learning and application were slightly lower at School D (*M* = 2.17) and School E (*M* = 2.50).

Findings for Research Question 4

Do teachers' perceptions of shared personal practice vary across the five

elementary schools within the same school district? The teachers' perceptions of shared personal practice across all five schools resulted in a mean of 2.60, which was below the mean scores at School A (*M* = 3.00), School B (*M* = 3.17), and School C (*M* = 2.94). Table 4 shows the mean scores for shared personal practice were slightly lower at School D (*M* = 2.17) and School E (*M* = 2.39).

Table 3

Descriptive Statistics for Collective Learning and Application

Item	No. teachers	Minimum	Maximum	Mean	*SD*
All schools	12	1.50	4.00	2.52	0.63
School A	1	2.75	2.75	2.75	0.00
School B	2	1.50	4.00	2.75	1.76
School C	3	2.25	3.00	2.67	0.38
School D	3	1.75	2.50	2.17	0.38
School E	3	2.25	2.75	2.50	0.25

Table 4

Descriptive Statistics for Shared Personal Practice

Item	No. teachers	Minimum	Maximum	Mean	*SD*
All schools	12	1.17	3.83	2.60	0.72
School A	1	2.75	2.75	3.00	0.00
School B	2	2.50	3.83	3.17	0.94
School C	3	2.50	3.50	2.94	0.51
School D	3	1.17	2.67	2.17	0.75
School E	3	2.00	3.00	2.39	0.54

Findings for Research Question 5

Do teachers' perceptions of supportive conditions–relationships vary across the five elementary schools within the same school district? The teachers' perceptions of

supportive conditions–relationships across all five schools resulted in a mean of 2.75, which was below the mean scores at School A (*M* = 3.00) and School C (*M* = 3.00). Table 5 shows the mean scores for supportive conditions–relationships were slightly lower at School B (*M* = 2.50), School D (*M* = 2.67), and School E (*M* = 2.67). It is important to note that this construct consisted of only one survey item, as opposed to mean scores created by multiple items.

Table 5

Descriptive Statistics for Supportive Conditions–Relationships

Item	No. teachers	Minimum	Maximum	Mean	*SD*
All schools	12	1.00	4.00	2.75	0.75
School A	1	3.00	3.00	3.00	0.00
School B	2	1.00	4.00	2.50	2.12
School C	3	3.00	3.00	3.00	0.00
School D	3	2.00	3.00	2.67	0.58
School E	3	2.00	3.00	2.67	0.58

Findings for Research Question 6

Do teachers' perceptions of supportive conditions–structures vary across the five elementary schools within the same school district? The teachers' perceptions of supportive conditions–structures across all five schools resulted in a mean of 2.60, which was below the mean scores at School A (*M* = 3.00), School B (*M* = 2.94), and School C (*M* = 2.94). Table 6 shows the mean scores for supportive conditions–structures were slightly lower at School D (*M* = 1.94) and School E (*M* = 2.39).

Summary

Teachers' perceptions of shared and supportive leadership across all five schools was 2.63, which was between a rating of disagree and agree. Teachers' perceptions of

shared values and vision across all five schools was 2.62. Teachers' perceptions of collective learning and application across all five schools was 2.52. Teachers' perceptions of collective learning and application across all five schools was 2.52. Teachers' perceptions of shared personal practice across all five schools was 2.60. Teachers' perceptions of supportive conditions–relationships across all five schools was 2.75. Teachers' perceptions of supportive conditions–structures across all five schools was 2.60.

Table 6

Descriptive Statistics for Supportive Conditions–Structures

Item	No. teachers	Minimum	Maximum	Mean	*SD*
All schools	12	1.17	3.83	2.60	0.71
School A	1	3.00	3.00	3.00	0.00
School B	2	2.50	3.50	2.94	0.50
School C	3	2.50	3.50	2.94	0.50
School D	3	1.17	2.67	1.94	0.75
School E	3	2.00	3.00	2.39	0.53

Chapter 5: Discussion

Introduction

This applied dissertation was designed to determine if there was a difference in the fifth-grade teachers' perceptions of the PLC model across five elementary schools in the target school district. The problem was that it was unknown if the school-based PLC initiative that was implemented during the 2015-2016 school year impacted teachers' instructional and professional practices. The target school district invested time and funding to implement the PLC initiative. Although the district had implemented and adopted the PLC model for over 10 years, there had been no collection of data examining differences across the five elementary schools in the target school district.

The purpose of this study was to determine if differences existed in teachers' perceptions of the PLC model across five elementary schools in one midwestern school district. Although the PLC model had been implemented over 10 years, the target school district had not investigated teachers' perceptions of the extent to which school-level practices impacted their professional learning. By conducting this study, the researcher increased the body of knowledge within the target school district regarding teachers' perceptions of the framework of a PLC and its ability to provide a foundation for teachers' professional growth; moreover, the researcher increased the body of knowledge concerning the ability of each practice of the PLC model to promote ongoing professional growth among the target elementary school teachers. It is important to note that the differences in the results were very small and, therefore, should be interpreted with caution because the researcher was not able to test for statistically significant differences.

Elaboration and Interpretation of Results

Research Question 1. The first research question sought to determine if

perceptions of shared and supportive leadership varied across the five elementary schools within the target school district. The mean perception of shared and supportive leadership across all five schools was 2.63, which was lower than the mean score at School A (M = 3.60), School B (M = 2.70), and School C (M = 3.07) but higher than the mean score at both School D (M = 2.07) and School E (M = 2.40). The range in participants' scores was 2.60, and the mean score across all five schools was in the range of disagreement (i.e., 2.00 to 2.99).

The mean perception of shared and supportive leadership across five schools did not align with the finding of Parks (2014), who conducted a descriptive study that included elementary teachers from the western part of the United States. Similar to this study, Parks used a 4-point Likert scale survey to determine teachers' perceptions of shared and supportive leadership within their PLCs. Parks found the mean score among teachers for the construct of shared and supportive leadership was approximately 3.00, and, therefore, elementary teachers perceived they received shared and supportive leadership within their PLCs.

Although the researcher did not assess factors impacting teachers' perceptions of shared and supportive leadership, participants from School B, School D, and School E may have perceived their school administrators did not facilitate teacher collaboration and participation nor did they foster a collaborative climate. Carpenter (2015) believed shared and supportive leadership was essential to both the climate of and the morale within the PLC. Carpenter further noted that an effective PLC promoted both shared leadership and mutual respect among its members. Furthermore, Buttram and Farley-Ripple (2016) believed the role of administrators in PLCs was to facilitate teacher participation and collaboration. Kincaid (2014) found a lack of shared teacher leadership

impacted the effectiveness of the PLC. Olivier and Huffman (2016) believed developing school-level leadership skills among PLC members was critical to the success of the PLC model. DuFour and DuFour (2012) believed the PLC was sustainable when its members were committed and when a transformational leader fostered a collaborative school climate.

Research Question 2. The second research question sought to determine if teachers' perceptions of shared values and vision varied across the five elementary schools within the target school district. The mean perception of shared values and vision across all five schools was 2.62, which was lower than the mean score at School A (M = 3.20), School B (M = 2.90), and School C (M = 3.07) but higher than the mean score at both School D (M = 2.07) and School E (M = 2.33). Further analysis of the results revealed that, although School A, School B, and School C had mean scores that were above the mean score across all five schools, the number of participants from these three schools was identical to the number of participants from both School D and School E; hence, the mean score for six participants was lower than the mean score across all five schools, and the mean score for six participants was higher than the mean score across all five schools. The range in participants' mean scores was 2.20, and the mean score across all five schools was in the range of disagreement (i.e., 2.00 to 2.99).

Although the researcher did not assess factors impacting teachers' perceptions of shared values and vision, participants from School B, School D, and School E may have perceived their school administrators did not promote student achievement by promoting teachers' capacity to make data-driven decisions and by encouraging teachers to share knowledge. Shared vision is a common goal that has a clear link to the organization's purpose (Senge, 2006). The shared values and vision dimension focus on norms,

expectations, goals, and shared vision that guides teaching and learning (Olivier & Huffman, 2016). The shared values of PLC members are connected to the vision of the organization (DuFour & DuFour, 2012). Members of the PLC support teaching and learning by making data-driven decisions (Fullan, 2014; Huffman et al., 2015; Owen, 2016). Referencing Senge's organizational learning theory, teachers' perceptions should be aligned with the continuous development of their capacity to create desired results in their learning community through generative thinking, disseminating knowledge, and sharing their expertise within the learning community (Krier, 2014; Senge, 2006; Stewart, 2017).

Research Question 3. The third research question sought to determine if teachers' perceptions of collective learning and application varied across the five elementary schools within the same school district. The mean perception of collective learning and application across all five schools was 2.52, which was lower than the mean score at School A (M = 2.75), School B (M = 2.75), and School C (M = 2.67) but higher than the mean score at both School D (M = 2.17) and School E (M = 2.50). Further analysis of the results revealed that, although School A, School B, and School C had mean scores that were above the mean score across all five schools, the number of participants from these three schools was identical to the number of participants from both School D and School E; therefore, the mean score for six participants was lower than the mean score across all five schools, and the mean score for six participants was higher than the mean score across all five schools. The range in participants' mean scores was 2.50, and the mean score across all five schools was in the range of disagreement (i.e., 2.00 to 2.99).

Participants across all five schools may have perceived their school administrators

did not provide a venue for stakeholders to work collectively to solve school-related issues. The research found it noteworthy that none of the mean scores across the five schools were in the range of agreement (i.e., 3.00 to 3.99). The collective learning and application dimension consists of collaborative teams engaging in shared knowledge, strategies, collective inquiry, and problem solving (Olivier, Hipp, & Huffman, 2010). Based on the mean scores, Vygotsky's constructivist theory was not embedded in the PLC dimensions across all five schools.

Within the PLC, teachers who exhibit the characteristics associated with the constructivist theory exhibit the behaviors of collective inquiry, application, and knowledge within the context of each school (Aylsworth, 2012; Karpen, 2015; Vygotsky, 1986). Further, social constructivism is demonstrated through social interactions, team collaboration, and collective inquiry, which are distinguishing characteristics of effective PLCs (Aylsworth, 2012; Karpen, 2015; Vygotsky, 1986). Brevitti (2014) found teachers had difficulty collaborating due to lack of time and support. Teachers needed professional development and mentoring to assist them in maximizing the benefits of collaborative teaming.

Research Question 4. The fourth research question sought to determine if teachers' perceptions of shared personal practice varied across the five elementary schools within the same school district. The mean perception of shared personal practice across all five schools was 2.52, which was lower than the mean score at School A (M = 3.00), School B (M = 3.17), and School C (M = 2.94) but higher than the mean score at both School D (M = 2.17) and School E (M = 2.39). Further analysis of the results revealed that, although School A, School B, and School C had mean scores that were above the mean score across all five schools, the number of participants from these three

schools was identical to the number of participants from both School D and School E; therefore, the mean score for six participants was lower than the mean score across all five schools, and the mean score for six participants was higher than the mean score across all five schools. The range in participants' scores was 2.66, and the mean score across all five schools was in the range of disagreement (i.e., 2.00 to 2.99).

Participants from School C, School D, and School E may have perceived their school administrators did not facilitate teachers' ability to establish collegial relationships by providing substantive feedback to each other regarding instructional practices. The inability to establish collegial relationships may be especially prevalent among teachers who worked at School D and School E, as their mean scores were at the low end of the range of disagreement. The shared personal practice dimension consists of PLC members fostering collegial relationships by establishing mutual respect and trustworthiness (Higgins, 2016; Olivier et al., 2010). The characteristics associated with shared personal practice are collaboration, peer observations, and formative feedback from colleagues in a nonevaluative approach (Dos Santos, 2017; Olivier & Huffman, 2016). Olivier and Huffman (2016) found teachers in PLCs were in collegial relationships and engaging in opportunities for shared practices. According to Sims and Penny (2014), teachers improve student achievement by promoting instructional practices through indepth conversations, action research, and collective inquiry.

Research Question 5. The fifth research question sought to determine if teachers' perceptions of supportive conditions–relationships varied across the five elementary schools within the same school district. It is important to note that this construct consisted of only one survey item. The teachers' perceptions of supportive conditions–relationships across all five schools was 2.75, which was below the mean score at both School A (*M* =

3.00) and School C (M = 3.00) but higher than the mean score at School B (M = 2.50), School D (M = 2.67), and School E (M = 2.67). Further analysis of the results revealed the number of participants from both School A and School C was four, and the number of participants from School B, School D, and School E was eight; therefore, the mean score for two thirds of the sample was lower than the mean score across all five schools, and the mean score for one third of the sample was higher than the mean score across all five schools. The range in participants' scores was 3.00, and the mean score across all five schools was in the range of disagreement (i.e., 2.00 to 2.99).

Participants in School B, School D, and School E may have perceived relationships among PLC members to be unsupportive. Teachers may be exhibiting difficulty with openly examining student data and discussing their findings with their colleagues. The supportive conditions–relationships dimension pertains to promoting mutual respect and trust among colleagues and to fostering collegial relationships. DuFour et al. (2016) asserted teachers in PLCs should support each other and dedicate themselves to confronting divergent behaviors such as a lack of collegial support and collaboration. With the mean scores for two thirds of the sample being lower than the mean scores across all five schools, the target school district leaders may need to implement systems to assist PLC members in developing supportive relationships. Supportive relationships allow school staff to have meaningful conversations, problem solve, create innovative solutions, and examine data to enhance teaching and learning (Fullan, 2014; Hattie, 2012; Olivier et al., 2010; Owen, 2016).

Research Question 6. The sixth research question sought to determine if teachers' perceptions of supportive conditions–structures varied across the five elementary schools within the same school district. The teachers' perceptions of

supportive conditions–structures across all five schools was 2.60, which was lower than the mean score at School A (*M* = 3.00), School B (*M* = 2.94), and School C (*M* = 2.94) but higher than the mean score at both School D (*M* = 1.94) and School E (*M* = 2.39). Further analysis of the results revealed that, although School A, School B, and School C had mean scores that were above the mean score across all five schools, the overall number of participants from these three schools was identical to the number of participants from both School D and School E; therefore, the mean score for six participants was lower than the mean score across all five schools, the mean score for six participants was higher than the mean score across all five schools, and the mean score across all five schools was in the range of disagreement (i.e., 2.00 to 2.99).

Participants in School B, C, D, and E may have perceived a lack of supportive conditions such as a lack of common planning time and a school schedule that does not promote collective learning and shared practice, although the perceived lack of supportive among fifth grade teachers at School B and School C was only slightly below the range of agreement (i.e., 3.00 to 3.99), and, therefore, a lack of supportive conditions may not have been as prevalent at School B and School C as it was at School D and School E. These barriers may hinder PLC members' ability to engage in collective inquiry, analyze student data, enhance instructional practices, and participate in professional development (Robbins, 2013; Sims & Penny, 2014). The supportive conditions–structures dimensions pertain to time, resources, and funding for PLC members (Robbins, 2013). Watson (2014) indicated effective PLCs need school schedules that are conducive to collective learning, to collaboration, and to professional growth.

Implications of Findings

The purpose of the PLC was to increase student achievement by implementing the six dimensions of the PLC model: (a) shared and supportive leadership, (b) shared values and vision, (c) collective learning and application, (d) shared personal practice, (e) supportive conditions–relationships, and (f) supportive conditions–structures. This study was conducted in five suburban schools, limiting generalizability to the schools in this study. The implications discussed are specific to the five schools in the target school district. Cunningham (2016) asserted establishing shared leadership and vision were significant to implementing and sustaining an effective PLC. Administrators and teachers pursue a direct and explicit purpose for student learning (DuFour et al., 2016; McLeskey et al., 2014; Owen, 2014). During collaborative activities and professional development, members of the PLC analyze and discuss assessment data for insight on students' strengths and areas of need (Owen, 2014).

Limitations

The study has several limitations that warrant discussion. The limitations in this study include the following: (a) role of the researcher, (b) small sample size, (c) sampling, and (d) self-reported data. The limitations of the study impacted the data analysis and conclusions.

Role of the researcher. The first limitation was the teacher's employment with the target school district and the collegial relationships the researcher developed with this study's participants by attending department and professional-development meetings with them. To address any issues with familiarity, the researcher removed any identifying information from each participant's survey. The researcher did not hold a leadership position within the target school district and had not served as either a department

chairperson or a supervisor for the any of this study's participants. The researcher minimized this limitation by removing any identifying information from each participant's survey. The researcher does not hold a leadership position and has never been a department chairperson or held a supervisory position over the potential study participants in the school district; therefore, the researcher's role did not influence the viewpoints of the participants. The researcher also minimized this limitation by employing a neutral stance as she implemented the study procedures (Creswell, 2014b).

Small sample size. The second limitation was the study's sample size. According to Creswell (2014a), it can be difficult to determine significant relationships in a small sample size and limit generalization. A larger sample size and different location may produce inconsistent results (Creswell, 2014a). The small sample size did not detect statistical significance across the five elementary schools in the target school district; however, the study provides additional literature in the area of PLCs. A related limitation with respect to the sample was the inclusion of teachers from only one grade level. Including teachers across all grade levels would have provided a comprehensive and perhaps precise understanding of teachers' perceptions of the PLC model at their respective schools.

Sampling. The third limitation is the use of convenience sampling to select this study's participants. According to Creswell (2014a), purposeful sampling eliminates random sampling. The sampling method was appropriate because the researcher selected participants that were accessible (Creswell, 2014b). Although the current study had limitations, the results of this study allowed the researcher to provide significant insight regarding teachers' perceptions of professional learning communities.

Self-reported data. The fourth limitation involved participants' self-reported

data (Creswell, 2014b). The participants were administered the PLC assessment to obtain their perceptions of the six dimensions of the PLC model. Self-reported data can have bias the researcher is unable to control (Creswell, 2014b). Also, self-reported data were difficult to verify and the researcher relied on the honesty of participants to obtain an accurate view of their perceptions (Creswell, 2014a).

Recommendations for Future Research

The current study included fifth-grade teachers from five suburban elementary schools within the same school district. The researcher recommends expanding the scope of this study by including kindergarten through fifth-grade teachers from other elementary schools within the target school district.

Include teachers from other elementary schools in district. By including teachers from other elementary schools in the target school district, researchers can provide a comprehensive understanding of teachers' perceptions and use inferential statistics to test for significant differences between teachers across PLC dimensions. Researchers can also conduct a similar study and include teachers from other elementary schools, middle schools, and high schools in the target school district and compare participants' perceptions across school levels (i.e., elementary and middle school, middle and high school, elementary and high school) and determine if statistical differences exist in the data.

Adjust timing of study. Another recommendation for future research is conducting a similar study in school districts as they begin the implementing PLC model and administering a preimplementation survey to teachers in target schools at the beginning of the improvement cycle. Researchers can use the preimplementation survey data as baseline data of teachers' perceptions of the PLC dimensions. After the 3-year

improvement cycle, a postimplementation survey can be administered to teachers. Researchers can analyze and compare the preimplementation survey and postimplementation survey data across the target schools or the target school districts.

Utilize mixed-methods design. The researcher recommends conducting a similar study and using a qualitative or mixed-methods design to gain an indepth understanding of teachers' perceptions of the PLC model. Researchers who conduct a qualitative study can interview teachers and administrators and identify barriers that hinder the success of PLCs. Interviews will allow participants to convey their experiences, thoughts, and perceptions regarding PLCs (Brinkman & Kvale, 2014). Interweaving descriptions from interviews can provide insight into complicated processes within an organization.

Expand scope of study. A final recommendation for further research is to expand the scope of this study by including schools from multiple school districts. The small sample size was a limitation of this study, and future studies can aim to increase the sample sizes of teachers in efforts to have more power to utilize inferential statistics to test for statistical significant. Researchers can include elementary, middle, and high schools from school districts across the state of Missouri and compare teachers' perceptions of PLCs across school settings (e.g., rural, suburban, and urban) and school levels (e.g., elementary school, middle school, and high school). By including schools from across the state of Missouri, researcher can determine if statistical significant differences exist and increase the generalizability of their findings.

Summary

The implications of these findings are the target school district should provide professional-development opportunities aimed at increasing teachers' knowledge of the PLC dimensions. Based on the review of the literature and the results from this study, the

target school district should continue to adopt, implement, and sustain the PLC model as the six PLC dimensions guide educators and stakeholders. The district's educators and stakeholders should recognize the beliefs of the PLC community and exhibit proactive behaviors that increase student achievement (DuFour & Fullan, 2013). Buttram and Farley-Ripple (2016) suggested district leadership should focus on developing a strong vision and provide collaborative opportunities for teachers to make data-driven decisions.

The researcher believes school administrators across the district should follow the recommendation of Buttram and Farley-Ripple and work with stakeholders, create a unified school vision, and provide opportunities for teachers to collaborate. School administrators across the district should also ensure the PLC meets its desired outcomes and address potential issues within the PLC community. DuFour et al. (2016) asserted that a vitally important tenet of a PLC is the school improvement plan because it focuses on improving both the school's culture and student achievement. Owen (2014) found the initiatives of a PLC include permanent and sustaining changes in the school's culture. School administrators across the target school district should link the culture of their schools to their school improvement plans and celebrate the accomplishments of both students and teachers.

Conclusion

The researcher investigated fifth grade teachers' perceptions across five elementary schools in the target school district. The perceptions and practices of PLC members have an impact on the success of the learning community. The findings in this study suggest a need for shared and supportive leadership. Findings also indicate there is a need to build strong, trusting relationships among PLC members to enhance student learning. Administrators, teachers, and stakeholders are accountable for each other;

systems need to be in place that will allow PLC members to work as a cohesive team to enhance student learning and achievement. The target school district has been employing the PLC model for over 10 years, and the findings in this study provide insight on barriers impacting elementary learning communities. The literature review revealed the significance of initiating, implementing, and sustaining an effective learning community. The environment of an effective PLC allows members to build positive relationships, cultivate collegial discourse, and action research to enhance student learning.

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Appendix

Questionnaire

Questionnaire

Directions:
This questionnaire assesses your perceptions about your principal, staff, and stakeholders based on the dimensions of a professional learning community (PLC) and related attributes. This questionnaire contains a number of statements about practices which occur in some schools. Read each statement and then use the scale below to select the scale point that best reflects your personal degree of agreement with the statement. Shade the appropriate oval provided to the right of each statement. Be certain to select only one response for each statement. Comments after each dimension section are optional.

Key Terms:
- Principal = Principal, not Associate or Assistant Principal
- Staff/Staff Members = All adult staff directly associated with curriculum, instruction, and assessment of students
- Stakeholders = Parents and community members

Scale:
1 = Strongly Disagree (SD)
2 = Disagree (D)
3 = Agree (A)
4 = Strongly Agree (SA)

STATEMENTS		**SCALE**			
	Shared and Supportive Leadership	**SD**	**D**	**A**	**SA**
1.	Staff members are consistently involved in discussing and making decisions about most school issues.	0	0	0	0
2.	The principal incorporates advice from staff members to make decisions.	0	0	0	0
3.	Staff members have accessibility to key information.	0	0	0	0
4.	The principal is proactive and addresses areas where support is needed.	0	0	0	0
5.	Opportunities are provided for staff members to initiate change.	0	0	0	0
6.	The principal shares responsibility and rewards for innovative actions.	0	0	0	0
7.	The principal participates democratically with staff sharing power and authority.	0	0	0	0
8.	Leadership is promoted and nurtured among staff members.	0	0	0	0
9.	Decision-making takes place through committees and communication across grade and subject areas.	0	0	0	0

10.	Stakeholders assume shared responsibility and accountability for student learning without evidence of imposed power and authority.	0	0	0	0
11.	Staff members use multiple sources of data to make decisions about teaching and learning.	0	0	0	0
	STATEMENTS	**SCALE**			
	Shared Values and Vision	**SD**	**D**	**A**	**SA**
12.	A collaborative process exists for developing a shared sense of values among staff.	0	0	0	0
13.	Shared values support norms of behavior that guide decisions about teaching and learning.	0	0	0	0
14.	Staff members share visions for school improvement that have an undeviating focus on student learning.	0	0	0	0
15.	Decisions are made in alignment with the school's values and vision.	0	0	0	0
16.	A collaborative process exists for developing a shared vision among staff.	0	0	0	0
17.	School goals focus on student learning beyond test scores and grades.	0	0	0	0
18.	Policies and programs are aligned to the school's vision.	0	0	0	0
19.	Stakeholders are actively involved in creating high expectations that serve to increase student achievement.	0	0	0	0
20.	Data are used to prioritize actions to reach a shared vision.	0	0	0	0
	Collective Learning and Application	**SD**	**D**	**A**	**SA**
21.	Staff members work together to seek knowledge, skills and strategies and apply this new learning to their work.	0	0	0	0
22.	Collegial relationships exist among staff members that reflect commitment to school improvement efforts.	0	0	0	0
23.	Staff members plan and work together to search for solutions to address diverse student needs.	0	0	0	0
24.	A variety of opportunities and structures exist for collective learning through open dialogue.	0	0	0	0
25.	Staff members engage in dialogue that reflects a respect for diverse ideas that lead to continued inquiry.	0	0	0	0

26.	Professional development focuses on teaching and learning.	0	0	0	0
27.	School staff members and stakeholders learn together and apply new knowledge to solve problems.	0	0	0	0
28.	School staff members are committed to programs that enhance learning.	0	0	0	0
29.	Staff members collaboratively analyze multiple sources of data to assess the effectiveness of instructional practices.	0	0	0	0
30.	Staff members collaboratively analyze student work to improve teaching and learning.	0	0	0	0
	STATEMENTS	**SCALE**			
	Shared Personal Practice	**SD**	**D**	**A**	**SA**
31.	Opportunities exist for staff members to observe peers and offer encouragement.	0	0	0	0
32.	Staff members provide feedback to peers related to instructional practices.	0	0	0	0
33.	Staff members informally share ideas and suggestions for improving student learning.	0	0	0	0
34.	Staff members collaboratively review student work to share and improve instructional practices.	0	0	0	0
35.	Opportunities exist for coaching and mentoring.	0	0	0	0
36.	Individuals and teams have the opportunity to apply learning and share the results of their practices.	0	0	0	0
37.	Staff members regularly share student work to guide overall school improvement.	0	0	0	0
	Supportive Conditions - Relationships	**SD**	**D**	**A**	**SA**
38.	Caring relationships exist among staff and students that are built on trust and respect.	0	0	0	0
39.	A culture of trust and respect exists for taking risks.	0	0	0	0
40.	Outstanding achievement is recognized and celebrated regularly in our school.	0	0	0	0
41.	School staff and stakeholders exhibit a sustained and unified effort to embed change into the culture of the school.	0	0	0	0

42.	Relationships among staff members support honest and respectful examination of data to enhance teaching and learning.	0	0	0	0
	Supportive Conditions - Structures	**SD**	**D**	**A**	**SA**
43.	Time is provided to facilitate collaborative work.	0	0	0	0
44.	The school schedule promotes collective learning and shared practice.	0	0	0	0
45.	Fiscal resources are available for professional development.	0	0	0	0
46.	Appropriate technology and instructional materials are available to staff.	0	0	0	0
47.	Resource people provide expertise and support for continuous learning.	0	0	0	0
48.	The school facility is clean, attractive and inviting.	0	0	0	0
		0	0	0	0
49.	The proximity of grade level and department personnel allows for ease in collaborating with colleagues.	0	0	0	0
50.	Communication systems promote a flow of information among staff members.	0	0	0	0
51.	Communication systems promote a flow of information across the entire school community including: central office personnel, parents, and community members.	0	0	0	0
52.	Data are organized and made available to provide easy access to staff members.	0	0	0	0