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# The Study of the Impact of Professional Learning Communities and Student Achievement

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by

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

Jori K. Phillips

Signature: Jori K Phillips Date: 3/12/14

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Abstract

The purpose of this study was to determine if a difference existed between student learning, using the Missouri Assessment Program (MAP), and Professional Learning Community (PLC) implementation within fifth-grade populations in the state of Missouri. The following research questions were utilized to drive the research: What is the difference in MAP communication arts scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model? What is the difference in MAP math scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model? What are the perceptions of administrators of Missouri PLC districts regarding the Missouri PLC program and student achievement? Three years of math and communication arts data were analyzed in this study. Yearly mean scores were compared by applying a *t*-test to determine if a statistical significance existed between PLC implementation and student learning. Missouri PLC exemplary schools' data were analyzed and compared to data of like-demographic, non-PLC implementing schools. The data revealed, in the area of communication arts, no statistical significant difference in student achievement between PLC exemplary schools and non-PLC schools. These findings led to the decision to not reject the null hypothesis and not support the alternative hypothesis. A statistical significant difference was found in the area of math, and an overall conclusion was drawn that supported the alternate hypothesis and rejected the null hypothesis. In addition, interviews were conducted with Missouri PLC exemplary school administrators to gain perspectives into the daily successful workings and effect of the Missouri PLC model on

student achievement. Administrators from the PLC exemplary schools attributed gains in student achievement to PLC implementation.

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# Chapter One: Introduction

Professional Learning Communities (PLCs) have become more prevalent in Missouri school districts over the last decade. With the adoption of the Missouri PLC model across the state, little research has been committed to the comparison of data between student performance of districts that implement the Missouri PLC model and those that do not implement the Missouri PLC model. It is evident that this research is pertinent to the field of education, as it allows educational leaders to examine real-time effects the Missouri PLC program has in its full implementation on student learning and performance.

The background of PLCs is addressed in this chapter, while focusing on the foundations the program provides for school districts that choose to implement the program. Additionally, the problem statement and research questions associated with the research study have been outlined. Finally, limitations are addressed and terms pertinent to the understanding of the study have been defined.

## Background of the Study

PLCs in their purest form drive staff development in order to improve student learning and achievement (DuFour, DuFour, & Eaker, 2002). These learning communities exist in Missouri schools to promote collaboration among staff and administrators. The origin of PLCs began in the late 1980s (DuFour et al., 2002). DuFour et al. (2002) found that educators who felt supported both in their learning and teaching practices were more effective than educators who did not have a support network of peers.

These educators shared successes and difficulties freely, thus building effectiveness through the support and suggestion of colleagues (DuFour et al., 2002). The PLC model is best utilized when it drives a district's professional development. Failed methodologies, curriculum deficiencies, or faculty inconsistencies are all areas in which professional development avenues could be utilized through the PLC model (DuFour, DuFour, & Eaker, 2008).

As evidenced by DuFour et al. (2002), educators who acted in collaboration on a routine basis had better learner outcomes than those who did not. During professional development time, districts began allowing educators more opportunities for targeted collaboration (DuFour et al., 2002). These times were provided through a common planning time for same-area core or grade-level teachers (DuFour et al., 2002). Educators were able to utilize this time to plan common assessments and create goals relative to their schools' mission statements (Ainsworth & Viegut, 2006; DuFour et al., 2002). The structured time allotted for teacher collaboration was a key component of PLCs (DuFour et al., 2002).

DuFour et al. (2008) realized the potential of collaborative communities and had laid the foundation for model PLCs by bringing training to educators nationwide. The Missouri PLC project (2011) through the Missouri Department of Elementary and Secondary Education (MODESE), has worked to create a model PLC program. This program utilizes the Benchmark Assessment Tool (see Appendix A) and the Missouri PLC Implementation Rubric (see Appendix B) that is specific to the needs of students in Missouri and measures the effectiveness of Missouri PLCs.

**Conceptual Framework**

PLCs are often marketed to school districts as a school reform tool (DuFour, DuFour, Eaker, & Many, 2010). When using this tool, districts that implement practices as outlined by the PLC model should, according to research, see improved student performance (DuFour et al., 2010). This increase in student achievement is brought about through implementing the foundational pillars of the PLC (DuFour et al., 2008). More effective staff development should produce results through better teaching practices (Stoehr & Banks, 2011).

According to data retrieved from All Things PLC (2012), at Henry County Elementary School in Virginia, fifth-grade students met and then exceeded performance expectations when compared with the state average after implementing the PLC model. This three-year trend of marked improvement in student performance was measured in the first three years of the schools implementation of the PLC model (All Things PLC, 2012). Also, according to All Things PLC (2012c), since 2004, fifth-grade students, from Snow Creek Elementary School in Virginia, have remained above the state average in both math and communication arts scores.

This higher student performance had also been attributed to the implementation of the PLC model within this district (All Things PLC, 2012c). These studies of state testing data form the premise that if districts implement the PLC model, then student performance will increase. The following concepts may be present for districts implementing PLCs to realize increases in student performance (All Things PLC, 2012c).

The first of these components is a shared vision, mission, value, and goals (DuFour et al., 2002). This focus must be common to all members of the group and

based solely on student learning (DuFour & Fullan, 2013). This component also brings to the forefront the importance of how student learning transpires and why educators are focusing on specific areas (DuFour & Fullan, 2013).

The first specific area focuses on the district mission as a whole, while trickling down to specific building, then grade-level or classroom goals (DuFour et al., 2002). This common foundation creates a platform that presents educators with the venue to fully realize the full impact that mission, vision, and goals can have when shared (Venables, 2011). Southside Elementary School in Wyoming credits this team approach with increased student performance on state testing over the last three years in both communication arts and math (All Things PLC, 2012d).

DuFour et al. (2008) further stated that the second component of a PLC is a collaborative culture with a focus on learning. It is paramount that the effective PLC incorporates an unwavering focus on learning. Pinewood Elementary School personnel in Florida stated, "Students benefit when teachers develop a more in-depth understanding of content areas, of effective means of gathering and using formative assessment data, and of how to differentiate instruction to address needs" (as cited in All Things PLC, 2012b, p. 1). This transpires when educators can focus on what students should both know and be able to do as dictated by state standards and district curriculum (DuFour et al., 2010).

The focus on student learning should examine not only what educators teach, but what students are mastering (DuFour et al., 2010). This approach brings to the forefront the double-loop learning philosophy, where schools address vision, mission, values, and goals to ensure these areas are worthy of pursuing (Hall, Quinn, & Gollnick, 2013). This

philosophy directly addresses the success of teaching methodologies on student learning (Hall et al., 2013).

Another critical component of a PLC is collective inquiry (DuFour & Fullan, 2013). When educators use data to drive their instruction and teaching methodologies, student learning should take place (DuFour & Fullan, 2013; Schmoker, 2006). This component directly impacts how educators teach and what students learn (DuFour & Fullan, 2013). Pinewood Elementary School personnel stated that "as a result of PLCs, differentiated instruction is taking place in every classroom with focused, data-driven, direct instruction taking place throughout the day, frequently in small skill-based groupings (as cited in All Things PLC, 2012b, p. 1). This data-driven approach should be a foundational element to successfully investigate practices that should be changed or topics which should be re-taught or taught using a different methodology (DuFour et al., 2008).

Another attribute of higher student performance within the PLC model occurs when members of PLCs become action-oriented (DuFour et al., 2010). These individuals should be driven by doing (Covey, 2008). This is where the biggest portion of staff development enters into the PLC. The PLC model is best utilized when it drives a district's professional development (DuFour et al., 2010). Effective members of a PLC should seek continuous improvement within their PLC (Covey, 2008). This critical component exists when its members constantly seek improvement within themselves and their learning communities (Covey, 2004; DuFour et al., 2010; Schmoker, 2006). Education is an ever-changing career field.

With the evolution of technology, educators must continually take steps to stay ahead of the learning curve to best prepare meaningful instruction for students. Educators can attain successful improvement results by focusing and gathering data relative to student learning and progress toward district and state learning standards (Doerr, 2009; DuFour et al., 2010; Schmoker, 2006). Educators should also focus on strengths and weaknesses relative to student learning and performance, and plan to target those within their PLCs (DuFour et al., 2010; Schmoker 2006).

Members of effective PLCs should be results-oriented (DuFour et al., 2010). As Covey (2004) stated, educators should "begin with the end in mind" (p. 56). This universal concept fits into the PLC model prompting educators to assess the results of progress rather than good intentions (DuFour et al., 2008). This allows educators to closely take into account tangible results that are gathered at meaningful intervals. These results provide the basis for results-oriented collaboration and learning (DuFour et al., 2010; Schmoker, 2006).

While the components must be evident in a model PLC program, there are several other facets that must exist for a PLC to be an effective form of staff development (Doerr, 2009; DuFour et al., 2008). These components serve as a tool for educators to promote teacher effectiveness, therefore, having an indirect impact on student achievement (Covey, 2008; Doerr, 2009; DuFour et al., 2010; Foord & Haar, 2012). Strong administrative support must exist for PLCs to elicit deep-rooted, meaningful change (DuFour & Fullan, 2013).

To that end, administrators must lead the charge to ensure the PLCs in their buildings are focusing on the essentials of student learning success. According to

Schmoker (2006), it is the administrators who can set the stage for this targeted staff development to ensure growth occurs within the building. These concepts firmly establish the thought districts that implement the PLC model should have higher student performance scores than those that do not implement the PLC model.

**Problem Statement**

Many districts in Missouri have developed and implemented the PLC model to increase student achievement. For example, at South Elementary School in Eldon, Missouri, Principal Erin Rentfro (2007) stated, "teachers are seeing increased student gains as measured by their benchmark goals" (para. 3). While research exists to corroborate the effectiveness of the PLC model as a school reform initiative, little research has been conducted on how districts that implement the PLC model compare with districts that do not implement PLCs. There are relatively little data on how Missouri school districts implementing PLCs compare to their non-PLC counterparts.

**Purpose of the Study**

The purpose of this study was to analyze student achievement data from districts in Missouri by utilizing fifth-grade student scores from the Missouri Assessment Program (MAP). Communication arts and math scores were reviewed in districts that implement the Missouri PLC model. These scores were compared with student scores from districts that do not implement the Missouri PLC model to determine if a difference existed between the two groups. To garner perspectives from Missouri administrators regarding the PLC model, interviews were conducted.

**Research questions and hypotheses.** The following questions and hypotheses guided this study:

1. What is the difference in MAP communication arts scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?

2. What is the difference in MAP math scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?

3. What are the perceptions of administrators of Missouri PLC districts regarding the Missouri PLC program and student achievement?

$H1_0$: There is no difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP communication arts scores.

$H1_a$: There is a difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP communication arts scores.

$H2_0$: There is no difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP math scores.

$H2_a$: There is a difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP math scores.

**Dependent variable.** One dependent variable identified in this study was student achievement as evidenced by each school's fifth-grade MAP data in the area of math. Another dependent variable in this study was student achievement as evidenced by each school's fifth-grade MAP data in the area of communication arts.

**Independent variable.** An independent variable identified in this study was the districts that implement the PLC model and have been identified by the Benchmark Assessment Tool as exemplary schools. Another independent variable in this study was the districts that do not implement the PLC model and have no affiliation with the Missouri PLC model.

## Limitations

The following limitations were identified in this study:

**Geographic region.** This study was relative to student achievement and PLC implementation of school districts in Missouri. Due to the nature of the guidelines regarding Missouri PLC implementation, one cannot generalize the findings of this study. Generalities have been constructed to span Missouri if schools are of similar student and teacher demographics as the Missouri PLC exemplary schools.

**Student demographics.** While similar student demographics existed between the districts represented in this study, they were not exact. The utilization of all districts in Missouri created the assumption that this study was valid in this specific area. Consistency existed throughout the state, as schools included in this study were located in each of the nine Missouri regions.

**Teacher demographics.** While teacher demographics were similar between the districts represented in this study, they were not exact. Educators throughout Missouri

may have had varying years of experience and graduate education. Additionally, fifth-grade teachers may have had more/less experience with the Missouri PLC processes.

**PLC implementation.** While districts implementing the PLC model were identified by the Missouri PLC project as exemplary**,** levels of implementation may have varied between districts. Variations of PLC implementation could exist by year or structure. One should note that all districts identified as implementing districts did have the same foundation relative to all PLCs and had been identified using the Missouri PLC Benchmark Assessment Tool and Missouri Implementation Rubric as exemplary schools.

**Student achievement.** While utilizing standardized test scores to gauge student achievement was necessary in education, not all summative assessment scores were true indicators of student success. In addition, indicators of student achievement were numerous. There were many extraneous factors that could have had an effect on student achievement.

**Exemplary schools.** Missouri PLC exemplary schools have been identified over the last five school years. One limitation to this study was there had not been an abundance of Missouri PLC exemplary schools from which to choose in this study due to the newness of this type of Missouri PLC recognition.

**Study sample size.** Twenty-six Missouri PLC exemplary schools were identified for the 2010-2011, 2011-2012, and the 2012-2013 school years. While the population of the schools combined reaches over 5,000 students, the sample size of 26 could be considered a limitation.

## Definitions of Key Terms

For the purposes of this study, the following terms are defined:

**Missouri assessment program.** Annual summative assessment required by Missouri to be completed by all students each spring. The assessment measures student achievement relative to the areas of math, communication arts, and science. The scores derived from this assessment are utilized as one aspect of identifying a school district's performance (MODESE, 2012).

**Missouri comprehensive data system (MCDS).** The MODESE (2012) system of collecting and publishing data which allows access to testing and other data to both the general public and individuals in the field of education.

**Professional learning community (PLC).** An ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve. PLCs operate under the assumption that the key to improved learning for students is continuous job-embedded learning for educators (All Things PLC, 2012).

**Missouri professional learning community implementation rubric.** An instrument utilized to gauge the degree of which Missouri schools affiliated with the Missouri PLC project are implementing Missouri PLCs within their school (Missouri PLCs, 2013).

**Professional learning community benchmark assessment tool.** An instrument utilized to gauge the effectiveness and model fidelity of school districts implementing the PLC model in Missouri. This tool is used to find if consensus is apparent throughout

faculty and staff through analyzing survey results in key areas of PLC implementation. (MODESE, 2012).

**Summative assessment.** According to Stiggins (2009), an assessment of learning which is designed to provide a final measure of whether or not learning goals have been met. Summative assessments yield a dichotomy: pass or fail, proficient or not proficient (Ainsworth, 2006). Additional timely support is typically not forthcoming.

**Summary**

The research derived from this study serves to determine what difference, if any, that Missouri PLCs have on student achievement as compared to non-PLC implementing schools. Utilizing schools over a three-year period that had been awarded exemplary status through the Missouri PLC Benchmark Assessment Tool and Missouri PLC Implementation Rubric provided depth to the study through a multiple-year comparison. By comparing school districts within Missouri, this will provide a starting point from which educators and educational leaders can evaluate the program before taking measures to implement Missouri PLCs in their districts. DuFour and Eaker (2002) created the PLC model which has been utilized in several schools throughout Missouri.

PLC proponents have claimed that when fully and correctly implemented, PLCs provide a basis for effective staff development. These model programs embody the changing face of education while utilizing the nature of collaborative learning to achieve both student and teacher success, which in-turn, should promote higher levels of student achievement within the classroom. This collaborative focus allows districts to utilize individual staff talents while collectively benefiting and developing the whole (DuFour et al., 2008).

Much research has been cited in support of the implementation of PLCs as a staff development tool (DuFour et al., 2002; Schmoker, 2006). This research claimed that the PLC model data drives staff development, program modifications, and overall change (DuFour et al., 2002). The following chapter provides an overview of research that examines the foundation, components, and implementation of the PLC model in schools. The research provided will give the reader a full understanding of the Missouri PLC philosophy and the essential facets that must exist for a district to become an exemplary PLC school in Missouri.

# Chapter Two: Review of Literature

PLCs are currently implemented in almost 250 Missouri schools (MODESE, 2012). The implementation of PLCs within a district promote a collaborative learning environment in which educators can focus on key issues, build upon existing knowledge bases, and utilize data to improve teaching and learning practices (DuFour & Fullan, 2013; Garmston & von Frank, 2012). With the implementation of these practices, schools should see increases in student learning and achievement (DuFour et al., 2008). The purpose of this study was to determine what difference, if any, existed in student achievement between exemplary schools implementing the Missouri PLC model and non-PLC participating schools.

The information provided in the review of literature was included to afford a background of the origins and foundations of the PLC model, focusing specifically on the Missouri PLC model. This information is relevant to the study as it indicates that the PLC model is utilized in school districts as a reform initiative to increase teaching practices as a means to improve student performance. The information included provides evidence that is essential to establish the need for more research regarding Missouri PLC implementation and the difference, if any, it has on student performance and achievement. All literature included in this review is pertinent, relative, and serves as a basis for the need of the study.

## Foundations of PLCs

The PLC model appears differently depending on the district/building in which the model exists. It is important to note that while PLCs may appear dissimilar, they are based on the same foundations. Doerr (2009) stated, “it isn’t important to have the exact

definition or model agreed upon, because each community must meet the needs of its members and reflect its school culture" (p. 3). Doerr did, however, share that PLCs must have basic components to earn the designation of a PLC. These components include the following: a problem of focus for each group, a consistent meeting time, and a collaborative nature (Doerr, 2009; DuFour et al., 2010).

Data should be shared and discussions should revolve around the problem in an attempt to come to a resolution (Covey, 2008; Doerr, 2009). Differences may exist within the schools involved in the research study, yet all still embody the foundational pillars that meet the requirements of exemplary status as evidenced in the Missouri PLC Benchmark Assessment Tool. Additional foundational requirements of PLCs follow.

**Shared vision, mission, and goals.** The first foundation of a PLC is a shared mission, vision, and goals (DuFour et al., 2008). In 2008, the National Association of Elementary School Principals (NAESP) stated that PLCs are "founded on the belief that the core mission of public education is not simply to ensure that students are taught but to ensure that they learn" (p. 16). Another building block of PLCs is a shared vision (DuFour et al., 2010). The shared vision should be embraced by all in a PLC and be utilized to drive decisions concerning both teaching and learning.

Common goals should also exist within a PLC. These goals are created by members of a learning community and explain what students should both know and do (DuFour et al., 2010). A shared vision, mission, and goals are essentials to every PLC (NAESP, 2008). This foundational component requires that PLC districts focus these aspects to promote and increase student learning and achievement (DuFour et al., 2002). As Baker and Jakicic (2012) stated, "In a PLC, that mission is to increase student

learning, and all members have a clear and collective understanding of the work to be done" (p. 6).

**Values.** Values and commitments should also be established within a PLC (DuFour & Fullan, 2013). These values and commitments could vary depending on the building or district for which they were created (DuFour & Fullan, 2013). They should be aligned to the district's vision, mission, and goals (DuFour & Fullan, 2013; Garmston & von Frank, 2012). Additionally, evidence of goal alignment within the successful PLC should exist (Garmston & von Frank, 2012). DuFour et al. (2008) credited a successful learning environment to PLC implementation.

It is, therefore, necessary to compare districts that embody this learning philosophy against those districts that do not, as the core of PLCs resides with the improvement of student learning. Hord and Sommers (2008) stated that the values embodied by the PLC team should be an essential component of the mission to further student learning. The values essential to every Missouri PLC should embody a focus of collaboration, student learning, and results-oriented practices (Missouri PLCs, 2013).

**Collaboration.** Educators within the PLC realize that the way to achieve greater successes is by working together (Covey, 2008; DuFour et al., 2010). This focus on collaboration enables educators to discuss topics, such as classroom practices that are working and those that are not working (NAESP, 2008). To further this collaborative culture, educators participate in consistent meeting times to discuss student progress, goal alignment, and interventions, if necessary (DuFour et al., 2010). Allotment of time for educator collaboration is essential for districts that implement the PLC model (Baker & Jakicic, 2012; DuFour et al., 2010). Again, the foundational component of collaboration

has claimed to have a direct effect on student learning and achievement (DuFour et al., 2010; Hill, Lenning, Saunders, & Solan, 2012).

Collaboration is based on the practice of learning from other educators within the PLC team (DuFour & Fullan, 2013). Collaboration occurs when educators feel safe when sharing successes and struggles encountered within the classroom (DuFour & Fullan, 2013). The shared time to discuss best practices and identify areas for improvement ensures that educators are constantly seeking to grow professionally (DuFour & Fullan, 2013; Hill et al., 2012; Schmoker, 2006).

## Teacher Practices

In their review of the PLC model, Adams, Ross, and Vescio (2006) stated that "at its core, the concept of a Professional Learning Community rests on the premise of improving student learning by improving teaching practice" (p. 6). These researchers spent time comparing a district's involvement in learning communities and its difference to change in classroom practices (Adams et al., 2006). It was their conclusion that all involved in a learning community changed classroom practices as a result of collaboration with other educators (Adams et al., 2006). Moreover, "developing the capacity of educators to function as members of a PLC is the 'best known' means by which we might truly achieve historic, wide-scale improvement in teaching and learning" (Schmoker as cited in DuFour et al., 2005). This change in teaching practices leads to another essential that stems from PLC implementation.

**Methodology.** When seeking to change methodologies to meet student learning needs, most commonly, educators make changes to provide more individualized or small group differentiated instruction (Hord, Roussin, & Sommers, 2010). They also focus

more on inquiry-based learning ideals, forming students into collaborative groups when working on specific skills (Hord et al., 2010). DuFour et al. (2008) also suggested that changes, such as rotating work centers focusing on previously taught skills, be implemented within classrooms.

When asking the question as to whether or not PLCs impact teacher methodologies, the answer is a resounding *yes*; however, there has been little evidence that the change in methodology has led to higher student performance (Cuban, 2010). In contrast, Cuban (2010) brought to light that "occasional results show promise but studies remain sparse. Given this underwhelming display of evidence, why so much support for bringing hard-working professionals together weekly to talk and then return to their classrooms" (p. 1)?

It is evident from the lack of research solely focusing on the impact of PLC implementation and student performance that more research must be conducted. If schools are implementing PLCs without the gain of student achievement, they are wasting time and money on a philosophy that is not bringing results. Moreover, studies that have been conducted have only shown modest differences between the implementation of PLCs and student learning (Cuban, 2010).

**Feedback.** One instructional change occurring with the implementation of PLCs with the school setting is effective feedback provided to students by the teacher (Foord & Haar, 2012; Schmoker, 2006). Educators have created a learning environment for students in which personal accountability impacts goals and instruction (Foord & Haar, 2012; Schmoker, 2006). This shift in teaching practices occurs with the use of effective feedback techniques which allow students to monitor their own learning (Marzano, 2009;

Schmoker, 2006). Through personal goal setting, students are able to monitor their progress relative to goals created either with or without teacher influence (Schmoker, 2006).

Another area in which students receive more feedback is often seen through standards-based grading practices (Marzano, 2009). Through standards-based grading, students are able to keep track of which standards they have experienced difficulty with and standards they had mastered. The use of individual goal-setting through these practices is largely utilized in collaborative teams, where discussion occurs relative to student mastery of standards (Marzano, 2009). This allows educators to identify standards that were not mastered and individualize instruction relative to specific student goals and needs (Marzano, 2009; Schmoker, 2006).

**Professional development.** PLCs, by nature, drive educators to continually learn. The change in continual learning has been found in the teaching cultures of buildings where learning communities were consistent with the degree of achievement gains or successes (DuFour et al., 2008). Educators are also bound in their learning communities by common short and long-term goals (DuFour et al., 2008; Marzano, 2009). While seeking to achieve these goals, educators turn to research-based practices to ensure they would reach these goals (Ainsworth & Viegut, 2006; DuFour et al., 2008; Marzano, 2009).

Data drive instruction and are the basis for collaborative team meetings (DuFour et al., 2005). Areas of concern are discussed as educators seek to remedy weaknesses and expound upon strengths. This form of staff development is relevant, targeted, and data-driven (DuFour et al., 2005; Marzano, 2009).

One important strategy to further develop the PLC culture noted is a focus on developing teacher quality (Avillion, 2008; Foord & Haar, 2012). In addition to developing teacher quality, Foord and Haar (2012) emphasized the practice of educators aligning their professional goals to their students' learning goals. This practice creates an atmosphere within the PLC where student-centered learning and methodologies are concurrent (Foord & Haar, 2012). Since the implementation of PLCs promotes change in teaching methodologies, it is essential to utilize data analysis in relation to goal-setting on a larger scale (Schmoker, 2006). This ensures that these changes in methodology are having an impact on student performance.

**Cultural Shift**

The focus of all PLC collaborations within the school setting should rest on student learning (DuFour et al., 2008; Foord & Haar, 2012). Traditional schools typically focus on what the teacher is doing (DuFour & Fullan, 2013). Schools that implement the PLC model focus on what students are learning (Avillion, 2008; DuFour et al., 2002). Research conducted by DuFour et al. (2008) revealed that over the last two decades, educators were viewing themselves not in terms of knowledge but in terms of effectiveness.

Effectiveness is another factor that drives PLCs to continually develop staff members to higher levels of efficiency and effectiveness through the cultural shift (Avillion, 2008; Covey, 2008; DuFour et al., 2005). While making great strides in staff development, one must consider the effect that occurs on student learning and performance. If educators are provided with relevant, research-based staff development

and professional growth opportunities, it will, in turn, foster the implementation of best practices within the classroom.

Darling-Hammond and Richardson (2009) stated that "the content of professional development can make the difference between enhancing teachers' competence and simply providing a forum for teachers to talk" (p. 47). The PLC philosophy relies heavily on collaboration and meaningful professional development within PLC groups (Avillion, 2008; DuFour & Fullan, 2013). The design is conducive to creating an arena for changed instruction relative to student needs (Avillion, 2008). Common planning time and smaller school districts tend to be better equipped to allow such time for PLCs to work effectively (Doerr, 2009; DuFour et al., 2002). Team members create a safe sounding board to discuss ideas, goals, and areas of concern for continued staff development (Darling-Hammond & Richardson, 2009).

Cuban (2010) raised a concern that districts that did implement PLCs do so "with so little time and opportunity for teachers to come together to work on common problems and figure out solutions, teachers analyzing their classroom practices and acting collectively still remains rare" (p. 2). As districts are facing both budgetary and time restraints, it goes without saying that the programs in which they invest time and resources should be research-based, proven practices (Cuban, 2010). The effect that PLCs has on student achievement should be evident, thus, the need for additional research is pertinent to real-time evidence-based program implementation.

**Isolation to collaboration.** By relying solely on oneself, an educator can often become overloaded with the demands that the education field can present. The PLC culture redirects this burden to be collectively shared by fellow educators (DuFour et al.,

2002). With this collaborative culture, educators can work through issues faced together. Creating common assessments based on state level structures comes more easily when it is a collaborative process (Ainsworth & Viegut, 2006; DuFour et al., 2010). Districts that embrace this cultural shift are less-likely to scrap current curriculum and programs for the latest educational new idea or fad (DuFour et al., 2002). These districts rely on research-based designs and practices and change course only when necessity dictates (DuFour et al., 2002; Sagor, 2010).

According to Sagor (2010), educators within PLC teams must efficiently and effectively work together to bring about changes in practice through collaboration and inquiry. Another cultural shift evident in districts that employ the PLC model is the presence of targeted areas for improvement (Sagor, 2010). Data drive staff development, program modifications, and overall change (DuFour et al., 2002; Schmoker, 2006).

Time and conflicting schedules prohibit some school districts from implementing the PLC model (Stoehr & Banks, 2011). School structures and shared staff could limit the time for collaboration within a school district or building (Darling-Hammond & Richardson, 2009). Educators often lack vision on how to implement a practice, such as PLCs. Other struggles are more prevalent than the development of PLCs. Conflicting schedules and time issues are another reason that further research should be completed regarding the implementation of PLCs and student learning (Darling-Hammond & Richardson, 2009). If research supports the claim that PLC implementation has a strong impact on student performance, then districts may be more likely to tackle these issues.

**Leadership.** Principals of PLC schools should be found not only as leaders of PLC groups, but also as participants (Vitcov & Bloom, 2010). This cultural shift shows the principal as transparent and allows one to provide advice, as well as receive advice from other members of the PLC group (Berry, Johnson, & Montgomery, 2005; Vitcov & Bloom, 2010). This is also an outlet in which the principal can nurture the shared vision, mission, and goals of the group (Vitcov & Bloom, 2010). The principal within the PLC environment should be in a place to promote professional learning opportunities that focus on coaching and professional growth for all educators (Foord & Haar, 2012). This places added emphasis on the role of the administrator within PLC districts.

At the forefront of the successful PLC rests a sound leadership team. This team should consist of individuals dedicated to the quality and constant improvement of PLC teams within the district. These individuals seek to create a positive cultural climate where shared leadership exists (Covey, 2008).

The concept of shared leadership is critical to the success of the PLC process. It ensures that buy-in exists from team members, and all participants work together toward the common vision, mission, and goals created by the team process (Berry et al., 2005; Covey, 2008). Disseminating information and allowing for shared leadership within the leadership team and PLC teams afford all individuals essential roles within their respective PLC teams and school buildings (Berry et al., 2005; Covey, 2008). Additionally, this concept creates an environment conducive to growing leaders (Covey, 2008).

The cultural shift evident when implementing the PLC process changes the way educators interact (DuFour et al., 2008). This information is relevant to the study as it

explains one major difference between districts that have implemented the Missouri PLC model and those that have not. In addition, it brings to light ideals that embody the PLC philosophy. Hill et al. (2012) also noted that while schools may have the foundations of the textbook PLC in place, there can be gaps between theory and practice if leadership is lacking and shared leadership does not exist. These ideals include consistent interactions between grade-level and building-level groups to focus on methodologies that work, while enabling student learning to transpire (Whitaker, 2004).

**Effectiveness**

The development of PLCs is encouraged by the MODESE. Districts across the state have attended conferences regarding the implementation of PLCs at both state and regional meetings. While the MODESE promotes PLC implementation, little evidence is provided to districts that actually assess if districts or buildings in Missouri implementing PLCs are performing better on the state's summative MAP test. On the MODESE website, districts or buildings that have achieved exemplary status, according the Missouri PLC Benchmark Assessment Tool, are listed and recognized as model PLC schools in the state (MODESE, 2012).

Currently, the Missouri PLC program at the state level is gaining momentum and more professional development offerings are available at the regional and state level (Missouri PLCs, 2013). While information garnered from Missouri PLC exemplary schools was available for the current-year, information regarding the implementation process is still lacking (Missouri PLCs, 2013). One such PLC exemplary building, however, is also in Level 4 school improvement, according to the district report card (MODESE, 2012). This prompted further examination of the assumption that districts

that implemented the PLC model have higher student achievement than those that do not. It also brought about the need for more information regarding Missouri PLC implementation to be available for schools seeking to garner more information relative to the program's strengths and weaknesses.

**Missouri PLC program.** The Missouri PLC project began during the 2003-2004 school year (Missouri PLCs, 2013). The program was an offshoot of another MODESE reform initiative (Missouri PLCs, 2013). Beginning with few schools and only four regional trainers, the Missouri PLC project soon realized rapid growth (Missouri PLCs, 2013). By the 2007-2008 school year, Missouri PLC trainers were in each of the nine regional professional development centers across the state (Missouri PLCs, 2013). Currently, the Missouri PLC project continues to employ trainers in each RPDC; it also serves almost 250 schools from all areas of the state (MODESE, 2012; Missouri PLCs, 2013).

The Missouri PLC program mission, as retrieved from the MODESE (2012), is to "support Missouri schools in building and sustaining professional learning communities where collaborative cultures result in high levels of learning for all and increased student achievement" (para. 2). The Missouri PLC program is supported by the MODESE as a school reform tool (MODESE, 2012) and could become a nationally recognized model of school reform (Missouri PLCs, 2013). Communication is the key to creating a school reform initiative through the process of Missouri PLC implementation.

One vision of the Missouri PLC program is to produce a collaborative culture of learning with a focus on academic results (MODESE, 2012). The Missouri PLC program also provides an essential curriculum which is consistent throughout the state (Missouri

PLCs, 2013). This curriculum focuses on essential learner outcomes and provides for constant growth within a building's PLCs (Missouri PLCs, 2013). The program affords high-quality professional development available for all schools seeking to implement the foundations of the Missouri PLC program (MODESE, 2012). Additionally, the Missouri PLC program engages all participants in the continual professional growth process offered by state level PLC resource specialists (MODESE, 2012).

**Missouri essential curriculum.** According to the MODESE (2013), the Missouri Essential Curriculum is comprised of strands necessary for successful Missouri PLC implementation. The Missouri PLC Essential Curriculum exists as a focus for schools implementing the Missouri PLC model (MODESE, 2013). This curriculum focuses on areas in which effective teams work (MODESE, 2013).

Alignment within a school implementing the Missouri PLC model should begin with a strong foundation (MODESE, 2013). Other areas aligned and essential to successful Missouri PLC implementation are: administrative leadership, effective building leadership, a focus on student learning, assessment for learning, and the existence of structures to reach struggling learners (Missouri PLCs, 2013). An overarching aspect of the curriculum is a focus on continued improvement for all PLCs (Missouri PLCs, 2013).

**Missouri PLC implementation rubric.** The Missouri PLC Implementation Rubric is a tool utilized to gauge the effectiveness of implementation (Missouri PLCs, 2013). Eight strands that came directly from the Missouri PLC Essential Curriculum have been placed into rubric form for easy assessment (Missouri PLCs, 2013). Schools are scored in four categories of implementation: Minimal or No Implementation, Partial

Implementation, Proficient Implementation, or Deep Implementation (Missouri PLCs, 2013). Schools that have Proficient or Deep Implementation in each strand and showed academic increases as evidenced by Adequate Yearly Progress are deemed Missouri PLC exemplary schools (Missouri PLCs, 2013).

**PLC benchmark assessment tool.** The state of Missouri utilizes a benchmark assessment tool to indicate how well a district implements PLC practices (Missouri PLCs, 2013). A team from the Missouri PLC project typically spends one half-day to one day at each PLC building (Missouri PLCs, 2013). They conduct online surveys with PLC staff, the administration team, and the PLC leadership team (Missouri PLCs, 2013). Through these interviews, the team is able to assess where the district falls within the PLC Benchmark Assessment Tool.

In addition, this team also receives documentation of PLC practices from the district's administration relative to specific criterion within the Benchmark Assessment Tool (MODESE, 2012). Districts that score highly on the PLC rubric are deemed Missouri PLC exemplary schools (MODESE, 2012). The schools are designated by the guidelines as follows: "that the achievement of the school's students in the most recent year tested places the school among the highest performing schools in the state on state assessments of reading and mathematics" (MODESE, 2012, para. 2).

The designation awarded following the guidelines of the PLC Benchmark Assessment Tool suggests these districts have all of the pieces in place to provide optimal avenues for increased student performance (Missouri PLCs, 2013). In contrast, Deuel, Nelson, Slavit, and Kennedy (2009) argued that student learning and achievement is less about the formation of collaborative groups and more about individual teachers assessing

whether or not their students comprehended the material. In seeking to focus on gaps in student learning, educators are more likely to find ways to bridge those gaps and reach students (Deuel et al., 2009).

**Goal setting and alignment.** Specific, measurable, accountable, realistic, and time-limited (SMART) goals should be analyzed to measure progress within a PLC group (DuFour & Fullan, 2013). Schools that implement the PLC model align goals to gauge the effectiveness of its PLC. In addition, Foord and Haar (2012) also recommended adding the following three goals: goals for professional learning, goals to measure professional growth, and goals to support professional learning as evidenced by student achievement. Goal setting and alignment are essential to the success of PLCs within schools (Avillion, 2008; Foord & Haar, 2012). Goal setting is one essential component to the successful PLC process, as "goal alignment produces a systematic way to assess PLC practices, not just student achievement" (Foord & Haar, 2012, p. 34).

Sagor (2010) outlined essential habits that should exist within the PLC for it to be effective. Some of these attributes clearly outlined include an action research plan (Sagor, 2010). This action research plan includes goal setting and alignment utilizing a district's curriculum to enhance instruction (Avillion, 2008; Sagor, 2010). Goal setting and curriculum alignment are fluid (Sagor, 2010; Schmoker, 2006). These practices should be revisited throughout the school year through the PLC process (Sagor, 2010).

Goals and curriculum should be constant works-in-progress for the successful PLC building (Covey, 2004; Deuel et al., 2009; Sagor, 2010). Additionally, Sagor (2010) discussed the importance of acting with purpose within the PLC. When acting with a

clear purpose and goals aligned to action research, PLCs are able to experience success within their respective teams (Sagor, 2010).

**Data-driven decision making.** It is essential to the implementation of a PLC that groups utilize formative assessments to identify student learning or lack thereof, to inform instruction, to inform intervention, to promote goal alignment, and to promote the improvement of instructional practices (Schmoker, 2006; Stiggins, 2009). These formative assessments are created in collaborative teams and used as a tool to focus and align the group's goals and course of action (Ainsworth & Viegut, 2006; Foord & Haar, 2010; Stiggins, 2009).

When utilized effectively, the understanding gap decreases, and students' learning needs are met (Stiggins, 2009). The utilization of formative assessment data to drive staff development assists teachers within a PLC to direct school improvement initiatives (Ainsworth & Viegut, 2006; Stiggins, 2009). The utilization of data is essential to gauge the effectiveness of what students are learning, what they do not know, and how to reach students relative to where they fall in the two categories (Stiggins, 2009).

Knight (2010) credited successful PLC implementation to strong instructional leaders, teachers, and a district mission that supported data-driven decision making. He offered the use of specific questions within the PLC to drive this process (Knight, 2010). Knight (2010) suggested a top-down approach where principals know what effective instruction looks like and are able to facilitate it within their schools.

Additionally, teachers are provided with workshops and professional development opportunities that directly meet the needs revealed in data-driven reports (Hill et al., 2012; Knight, 2010). This practice exists in order to meet student needs and ensure

practices have a direct impact on student learning (Foord & Haar, 2012; Knight, 2010). Teams are formed to ensure that all avenues of data-driven decisions include all educators within the PLC team to bring about student success (Avillion, 2008; Knight, 2010).

Data derived from these assessments, when analyzed correctly, should be utilized within the PLC group to assess needs at the classroom level, the building level, and district level (Schmoker, 2006; Stiggins, 2009). Data analysis should also center on whether the assessments given are aligned to the building goals and desired outcomes for students (DuFour et al., 2010; Stiggins, 2009). Data analysis should also exist on the summative level to gauge the success of school-wide PLC implementation and its impact on student learning (Schmoker, 2006; Stiggins, 2009).

Through the years, educators have found both advantages and disadvantages to data-driven instruction, specifically within PLCs (Schmoker, 2006). One of highest concerns was the over-reliance on the collected data (Schmoker, 2006). When this occurs, educators could be faced with tunnel vision concerning student learning. Their focus in this case could shift away from the student and become solely reliant on data and test scores (Marzano, 2009). This abuse of data should be avoided, and the focus of instruction should always remain with student learning and success (Schmoker, 2006). The collaboration that occurs between educators through the PLC process is essential (Covey, 2008)

Another disadvantage to data-driven instruction occurs when districts are over reliant on state mandated testing (Schmoker, 2006). Oftentimes, the pressures that arise from failure to meet state standards and goals force educators to focus solely on the test

(Schmoker, 2006). This is a narrow-minded approach to student instruction and learning. The pitfalls with teaching solely to the test occur when educators fail to successfully prepare students for learning that occurs beyond the school setting (Avillion, 2006; Schmoker, 2006; Stiggins & DuFour, 2009).

According to Stiggins and DuFour (2009), educators might also face hardships when utilizing data-driven instruction when they become reactionary rather than proactive educators, even within the PLC setting. This issue occurs when educators fail to make needed changes within teaching methodologies or curriculum until the data dictated (Stiggins & DuFour, 2009). Educators who employ a focus on self-improvement and evaluation could avoid this trap by examining how they are teaching and what they are teaching impact student learning (Stiggins & DuFour, 2009).

Educators who have been in the field for several years are facing more changes than ever. Data-driven instruction forces the educator to think outside the box. Educators who have been "raised" on authoritarian views and lecture principles now must make the shift to differentiate instruction (DuFour et al., 2008). This requires educators are trained in the areas of differentiated and small group instruction, which is more likely to occur when PLC processes are in place (DuFour et al., 2008).

What steps should administrators take when they feel data are controlling their building? They should strive through professional development and a collaborative culture to remedy these issues. Educators who feel they are supported by both the administration and fellow staff are able to better utilize teaching methodologies that focus on data while providing for successful student achievement (Berry et al., 2005; Schmoker, 2006).

What steps should administrators take when there is no time to analyze the data collected? This can become a factor when districts overuse data. The best action is to focus data collection efforts on those facets that would be analyzed and the results acted upon (Marzano, 2009; Schmoker, 2006). Administrators should scrap any fluff data and focus on what is relevant to their respective district's vision, mission, and goals (Baker & Jakicic, 2012; Schmoker, 2006). This would ensure that time is available to analyze data that are meaningful and pertinent to the learning process (Schmoker, 2006).

Data-driven instruction has many advantages. The first is when it is utilized correctly to drive instruction and professional development (Schmoker, 2006). Relevant data should be collected and analyzed to see if district goals are being met (Baker & Jakicic, 2012; Schmoker, 2006). The PLC is the perfect avenue to form common assessments, analyze data findings, and take action regarding results. The focus should be aligned with both state and local standards (Schmoker, 2006). The PLC also serves as an opportunity for educators to collaborate and share best practices (DuFour et al., 2010; Marzano, 2009). It also allows for staff and administrative encouragement and support when weaknesses are found.

Marzano (2009) asserted that data-driven instruction provides information relative to areas of instruction that need improvement. This effective use of data could be utilized in the PLC setting to drive professional development and foster more empowered student learning (Schmoker, 2006). Educators could utilize this information to pursue self-improvement and become more knowledgeable in their subject areas.

## Research

Research involving student achievement and PLCs began shortly after its introduction in the late 1980s (DuFour et al., 2002). Since that time, districts had utilized PLCs as a school reform model (DuFour et al., 2002; DuFour & Fullan, 2013). In an effort to raise student achievement, PLCs were introduced into many districts throughout the United States (DuFour et al., 2002).

As more Missouri schools began implementing the PLC model, little research was conducted to gauge the program's effectiveness in Missouri schools, and no longitudinal studies exist relative to Missouri PLC implementation and achievement trends. Missouri has recognized schools that deeply implemented the Missouri PLC model and have shown improvement through Adequate Yearly Progress (AYP) data (MODESE, 2012). However, other factors that influenced the exemplary school recognition and the Missouri PLC journey schools took to reach recognition were not readily available.

**Student achievement and PLC implementation.** As some districts began turning to the PLC model as a school reform initiative, student achievement and gains were the forefront of this shift. In research conducted by Thompson and Niska (2004), six school districts in both urban and suburban Midwest regions were evaluated regarding the implementation of PLCs and its impact on student achievement (Thompson & Niska, 2004). These districts consisted of middle school aged students ranging from grades 5-8 (Thompson & Niska, 2004).

In all six school districts, gains in student achievement in both math and reading were found as evidenced by test scores, student work, and portfolios (Thompson & Niska, 2004). Surveys were distributed to each administrator relative to foundational

PLC pillars, and all were concluded to be active PLCs relative to survey results (Thompson & Niska, 2004). While the language utilized within these PLC-implementing schools differed, foundational pillars were consistent (Thompson & Niska, 2004). One was shared vision, mission, values, and goals, while another was the consistency of professional development time for educators (Thompson & Niska, 2004). Throughout all districts, common planning times and protected PLC time existed (Thompson & Niska, 2004). Administrators in these districts attributed gains in student achievement to the implementation of PLCs (Thompson & Niska, 2004).

In another study, Brewer Elementary in Columbus, Georgia, sought school reform through the implementation of PLCs (Yates & Collins, 2006). A study was conducted after educators in this district sought improved student achievement in both reading and math (Yates & Collins, 2006). After two years of teacher collaboration and the implementation of best practices realized through PLC meetings, gains were noticed in the area of communication arts (Yates & Collins, 2006). PLCs throughout the school relied on goal alignment and focused team meetings to develop and implement research-based practices or programs to enhance student learning (Yates & Collins, 2006).

After gains were made in communication arts, as evidenced by common assessments, educators within the PLC then focused on research-based methodologies to improve math skills (Yates & Collins, 2006). Yates and Collins (2006) stated that students, for the first time, made AYP on state standardized tests in both 2004-05 and 2005-06. While the district witnessed the see-saw effect when focus shifted from one core content area to another, balancing PLC time between efforts stabilized the swing in

achievement (Yates & Collins, 2006). The district continued to implement best practices and collaborate weekly through PLCs (Yates & Collins, 2006).

According to the *MODESE PLC Newsletter* (2011), Jackson High School administrators credited PLCs for large gains in student achievement over several years. Vince Powell, Principal, also gave PLC implementation credit for increased student achievement within the special education population (MODESE, 2011). Jackson became involved with the PLC process in an effort to bring rigor into the existing curriculum (MODESE, 2011). Another goal of the school was to share leadership throughout faculty and staff in lieu of the top-down leadership approach (MODESE, 2011). Shared leadership, collaboration, and common assessments through PLC implementation have benefited the school through an increase in student achievement marked by grade reporting and common assessments (MODESE, 2011).

In a study conducted by Berry et al. (2005), a 3rd-5th grade building consisting of 560 students was analyzed using quantitative data concerning student achievement and the implementation of PLCs. The study found that in the first year, 50% of students were achieving at grade-level standards based on results from grade level assessments (Berry et al., 2005). By the end of the four year study, 80% of students were achieving at grade level as evidenced by the same assessments (Berry et al., 2005).

The district continually sought improvement by altering instruction based on formative assessments throughout the year (Berry et al., 2005). Goals and curriculum alignment were revisited as necessary throughout the school year and mastery learning drove progress (Berry et al., 2005). Berry et al. (2005) attributed this improvement in

achievement to increased teacher practices through the implementation of PLCs within the district.

**General student achievement trends.** In 2006, the state of Missouri adopted a new approach to state mandated testing (MODESE, 2012). This was in response to the Federal No Child Left Behind (NCLB) Act of 2002. Missouri school districts were tasked with becoming 100% proficient in the areas of both math and communication arts by the year 2014 utilizing the state's summative assessment to assess knowledge (MODESE, 2012). The Missouri Assessment Program (MAP) test determines progress made relative to NCLB (MODESE, 2012).

According to the Center on Education Policy's report (2009), Missouri showed trends of moderate to large gains on the MAP test in communication arts in the years 2006-2008. Additionally, the report showed larger numbers of elementary aged students at the basic level of the MAP test in math over the three-year period (Center on Education Policy, 2009). This report revealed that while scores in communication arts rose, the level of students scoring at the advanced level dropped (Center on Education Policy, 2009). The report attributed these numbers in student achievement to Missouri schools aligning goals to meet the requirements of NCLB (Center on Education Policy, 2009).

These statewide trends occurring over a three-year period showed that student achievement was linked to change factors in educational institutions (Center on Education Policy, 2009). Upon reflection on this report, one could surmise that the implementation of PLCs in schools could have been one of the change agents to have increased student achievement. This is another reason that more research should be conducted regarding the impact that PLCs has on school districts.

According to the Missouri *MODESE PLCs End-of-Year Newsletter* (2011), students in Missouri were scoring higher on the MAP test in all elementary areas. This growth rate, however, was not enough for Missouri schools to meet the high demands of the state's AYP targets. According to the MODESE (2012), less than half of the districts implemented the PLC model. Is implementing PLCs in Missouri schools a reform initiative that could bring improved student learning? Educational leaders should have access to research that compares the PLC implementing districts with those that do not, to gauge the effectiveness of the PLC effort across Missouri.

**Missouri PLC implementation.** According to the *MODESE PLC End-of-Year Newsletter* (2013), the spring of 2011 marked the first field-test of the Missouri PLC Benchmark Assessment Tool. At that time, PLC leaders at the state level felt the need to provide a more reliable, valid way to measure Missouri PLC implementation. The Benchmark Assessment Tool was utilized to assess the depth to which Missouri schools were implementing PLCs (Missouri PLCs, 2013).

Twelve benchmarks are assessed through the Benchmark Assessment Tool, and the results provide schools information relative to their strengths and weaknesses regarding Missouri PLC implementation (Missouri PLCs, 2013). Additionally, the Benchmark Assessment Tool utilizes surveys, phone interviews, and open-ended questioning techniques to gauge program implementation (Missouri PLCs, 2013). The Benchmark Assessment Tool, while providing an idea of the depth of implementation, does not cover areas, such as academic achievement as attributed to Missouri PLC implementation (Missouri PLCs, 2013).

At the state level, Missouri PLC program directors and team members realized that professional development opportunities were lacking (MODESE, 2011). The state sought to provide more assistance to schools implementing the project through a yearly, focused Powerful Learning Conference (MODESE, 2011). This conference would provide training and support to districts involved in the Missouri PLC program (MODESE, 2011).

The Powerful Learning Conference is sponsored by the School Improvement section of the MODESE (2012). The conference is the largest professional development initiative in the state for districts implementing PLCs (MODESE, 2012). Each year, schools that meeting the criterion set forth by the Benchmark Assessment Tool and the Implementation Rubric are recognized as Missouri PLC exemplary schools at the Powerful Learning Conference (MODESE, 2011).

Throughout the course of the 2012-2013 school year, the Missouri PLC project was engaged with 246 schools (not districts) across Missouri (MODESE, 2013). Of these schools implementing the Missouri PLC Project, 105 of these schools were in year three or four of PLC implementation (MODESE, 2013). These data revealed that the Missouri PLC project initiative is growing in participation, as there were 141 schools in years one or two of the PLC project implementation (MODESE, 2013). With the growing number of participating schools, additional research is necessary to move from merely gauging implementation to assessing the program impact on student achievement and success.

**Summary**

The PLC model has been practiced in the nation's schools for over three decades. With the implementation of PLCs come many other practices that stem from the

collaborative culture of learning and doing. While research exists to identify increases in student achievement for PLC implementing schools, the state of Missouri has little research to identify long-term advantages of Missouri PLC implementation. Additionally, long-term research regarding upward trends in student achievement, attributed to Missouri PLC implementation, does not exist.

The Missouri PLC is predicated on the premise that results-orientation is a pillar of the PLC process (Missouri PLCs, 2013). Action research should exist to promote the strengths and identify the weaknesses of the program. It is for this reason that this study is pertinent to the field of education, as it relates directly to a program implementation that could ensure increases in student achievement through this marketed school reform tool.

The foundations of PLCs were presented. The conceptual framework driving the study was discussed. Additionally, teacher practices relevant to the implementation of PLCs were stated. The cultural shift occurring over the last three decades in education, relative to PLC implementation was outlined. Teacher effectiveness relative to the PLC process was asserted. Research regarding PLCs and student achievement was synthesized.

In the following chapter, the methodology utilized in this study is presented. The problem and purpose of the research are reviewed. The research questions and hypotheses are restated. The rationale for quantitative and qualitative research is synthesized. Additionally, the research design is discussed in detail. The population and sample are specified, and the instrumentation is outlined in order to present the continuity

of the study. The data collection methods and data analysis methods are discussed to give a clear picture of this research study in its entirety

# Chapter Three: Methodology

PLCs exist in Missouri school districts as a reform model. As Senge (1990) predicted, "the most successful corporation of the future will be a learning organization" (p. 4). This study was conducted to ascertain what difference, if any, existed between the implementation of the PLC model and higher student achievement as compared to schools that did not implement the Missouri PLC model. This chapter provides an overview of the methodology that was utilized to examine whether this difference exists.

In this chapter, the problem and purpose of the research are reviewed. The research questions and hypotheses are presented. The rationale for quantitative and qualitative research is synthesized. Additionally, the research design is detailed. The population and sample are specified, and the instrumentation is outlined in order to present the continuity of the study. The data collection methods and data analysis procedures are discussed to give a clear picture of this research study in its entirety.

## Problem and Purpose Overview

Research conducted for this study determined if there was a difference between the implementation of the Missouri PLC model and student achievement as evidenced by fifth-grade MAP math and communication arts scores retrieved from the MODESE as compared to non-PLC schools. The National Board for Professional Teaching Standards stated that "accomplished teachers collaborate with others to improve student learning." (2007a, p. 1). As summarized by Darling-Hammond and Richardson (2009), the National Council of Teachers of Mathematics (NCTM) stated that math leaders should "ensure a systematic implementation of a PLC throughout all aspects of the mathematics curriculum, instruction and assessment at the school, district, and regional level" (p. 48).

In addition, the National Council of Teachers of English (NCTE) (2006) argued that teachers who are involved in PLCs "feel confident and well prepared to meet the demands of teaching" (p. 10). One is led to test these remarks in the areas of both math and communication arts to determine the differences, if any, PLCs have on student achievement in these areas.

**Research questions and hypotheses.** The following questions and hypotheses guided this study:

1. What is the difference in MAP communication arts scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?

2. What is the difference in MAP math scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?

3. What are the perceptions of administrators of Missouri PLC districts regarding the Missouri PLC program and student achievement?

$H1_0$: There is no difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP communication arts scores.

$H1_a$: There is a difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP communication arts scores.

$H2_0$: There is no difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP math scores.

$H2_a$: There is a difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP math scores.

**Rationale for Quantitative and Qualitative Research**

Quantitative data can be very effective in drawing conclusions relative to educational research when utilized correctly (Connolly, 2007). Quantitative data analysis allows conclusions to be drawn relative to specific sets of data (Connolly, 2007; Ravid, 2011). One may argue that quantitative data analysis lacks the social aspect needed to delve deeper into any given sets of data comparison, but one cannot argue with the mathematical certainty found in quantitative analysis (Creswell, 2009).

It is for this reason that researchers in education seek to equip those utilizing quantitative research methods with a greater knowledge of research methodology, limitations to educational research studies, and conclusions that can be drawn from such tests (Bluman, 2009; Connolly, 2007; Creswell, 2009). While quantitative data analysis relies on numerical values and outcomes, correct interpretation of the data is essential to fully understand a quantitative study (Connolly, 2007; Creswell, 2009). At the heart of research, numerical data provides a fool-proof outlet in which to test a research question or hypotheses (Bluman, 2009).

As Creswell (2009) stated, "in quantitative studies, researchers advance the difference among variables and pose this in terms of questions or hypotheses" (p. 7).

Presenting research questions in a manner that leads to mathematical outcomes brings objectivity to quantitative research (Creswell, 2009). Additionally, quantitative data analysis should be utilized for research questions involving statistical analysis, performance data, and statistical interpretations (Connolly, 2007; Ravid, 2011).

Quantitative studies lend themselves to testing and either supporting or not supporting alternate hypotheses and/or rejecting or not rejecting null hypotheses (Creswell, 2009). Educational research can be completed on a number of any data sets, with outcomes rendered and conclusions drawn in any area of educational research (Bluman, 2009; Connolly, 2007; Ravid, 2011). The use of quantitative data for this study ensures reliability within the findings (Creswell, 2009). The numerical MAP data analysis involved in this study is irrefutable and thus valid when analyzing research findings (Creswell, 2009).

Due to the statistical and mathematical nature of quantitative research, it is free from distortion during the research process. Quantitative research tests can be repeated several times providing a higher rate of reliability (Bluman, 2009). Additionally, mathematical analysis of given data sets provides one outcome, one research finding (Bluman, 2009; Ravid, 2011). It is for these reasons that a quantitative research design was utilized for the purposes of seeking what difference, if any, exists between Missouri PLC implementation and student achievement as compared to non-PLC schools.

In any type of educational research, norms exist to further the validity of the research process (Bluman, 2009; Creswell, 2009). Coupling the use of quantitative data with research norms and embedded statistical limitations considered, a quantitative research study leaves little room for researcher error or bias (Bluman, 2009; Creswell,

2009). When comparing two sets of groups, one can use a quantitative research method and draw conclusions as to whether a difference exists between the two sets of groups (Connolly, 2007; Ravid, 2011).

In education, this simple type of quantitative data analysis, using a *t*-test, can lead educators to evaluate programs independent of educator bias (Creswell, 2009; Ravid, 2011). However, due to the lack of perception gained through a quantitative study, a qualitative aspect was added to provide depth. The interview portion of the study was included to gain more insight as to the perceptions of administrators in Missouri's PLC exemplary schools.

Qualitative research provides a broad scope from which to choose the appropriate research design within a descriptive study (Creswell, 2009). Some individuals in the field of educational research believe that qualitative studies and their descriptive study lend to more research bias, and are therefore less reliable. Others counter that opinion, favoring the utilization of a more descriptive study to gain more insight and information from the research subjects which therefore adds reliability to the analysis of data.

Qualitative data derived from interviews add depth to quantitative research (Creswell, 2009). The qualitative aspect garnered insight as to the real-time perceptions of Missouri PLC exemplary school administrators. The interviews provided a deeper understanding of Missouri PLC implementation, as well as the daily struggles and successes educators faced through the process.

**Research Design**

A quantitative approach was utilized to ensure that data collection was standardized, efficient, and effective. To gather additional insight into the Missouri PLC

model and student achievement, qualitative interviews were used to obtain the perceptions of administrators in the Missouri PLC exemplary schools. Personal interviews were conducted, and the responses were transcribed.

The quantitative data utilized in this research were *ex-post facto* in nature and thus classified as causal-comparative (Ravid, 2011). The research sought to find indications through data analysis to determine if a difference existed between Missouri PLC implementation and student achievement as compared to non-PLC participating schools. The utilization of MAP data already in existence ensured that the independent variable of the study was not manipulated.

MAP data were collected in the fall of 2013 (for school years 2010-2011, 2011-2012, and 2012-2013) in the areas of math and communication arts. This data collection was conducted through the MODESE database. This database compiles the MAP scores of students in all public school districts in Missouri. The assessment is standardized and has been in existence for 14 years, providing a basis of reliability (MODESE, 2012).

Data were collected solely from the fifth-grade sample of Missouri PLC exemplary schools and non-PLC schools. The non-PLC schools were randomly selected. The percentiles of fifth-grade students scoring in either the advanced or proficient ranges on the MAP test were compared between the two sets: those identified as PLC exemplary schools and those not implementing the Missouri PLC model for each of the three school years. Each data year was analyzed separately then analyzed together to present a broad overview of the gains, if any, experienced over the three-year period in student achievement. The use of standardized assessment data ensures an unbiased, non-experimental data source which promotes reliability and validity of the research study.

**Population and Sample**

The population for this study included the fifth-grade MAP scores of students in Missouri public school districts over a three-year period. Schools that were awarded Missouri PLC exemplary status for one or more of the three years (2010-2011, 2011-2012, 2012-2013) were included in the population of the study. Additionally, schools that had no affiliation with the Missouri PLC process were considered. Schools that earned PLC exemplary status fifth-grade students' comprised the PLC exemplary school group. Schools that were not affiliated with the Missouri PLC project were considered for the non-PLC group.

First, geographic considerations were given to schools that were in the same region as the PLC exemplary school group. Next, student demographics were considered. Free and reduced price meal populations within a 10% range of the exemplary group were noted. Minority population and special education population were also considered. Teacher demographics did not impede the validity of the study as a large sampling population was utilized.

Regional and demographic considerations left a group of non-PLC schools for consideration in the study. To attain schools similar in demographics to the Missouri PLC exemplary schools, the MCDS portal was used. A randomizer was then utilized on this larger group to determine 17 schools for 2010-2011 school year, and 8 schools for each of the 2011-2012 and 2012-2013 school years. Data collection of the two groups then took place.

A sample was derived from fifth-grade student scores, in the areas of math and communication arts, for school years 2010-2011, 2011-2012, and 2012-2013. Two sets of

data were collected: student scores from the PLC exemplary school group and student scores from non-PLC school group. Only student scores in the advanced and proficient categories were utilized for this study.

This allowed the outcome of the research study to demonstrate greater validity within the context of the study (Bluman, 2009; Ravid, 2011). The degree of external validity in turn produced results that were easily generalized to the state of Missouri. This information can easily be applied to the field of education as it pertains to the entire state of Missouri.

An electronic mailing (e-mail) was sent to each administrator (principal) of a PLC exemplary school to request an interview. Of the 25 administrators, initially contacted, 6 consented to participate in an interview. Then, a letter of informed consent was forwarded to each administrator, as well as an interview schedule. The interviews were conducted by phone and/or in person based on the interviewees' request.

**Instrumentation**

The instrumentation utilized to conduct the data analysis for this study was the use of MAP data from the MODESE MCDS. The MCDS consists of a compilation of MAP data collected from every public school district in the state of Missouri (MODESE, 2012). These data were available in August after the completion of all spring 2013 MAP testing and are available to the public for review through the MODESE website. The data were also utilized in determining the report card or status of districts relative to a 14 point rating system which gives each school building an AYP score (MODESE, 2012). This score serves to determine which Missouri PLC schools would receive exemplary

status, along with the Benchmark Assessment Tool and Missouri PLC Implementation Rubric (MODESE, 2012).

In addition to attaining the raw data numbers required for this study from the MCDS database, this site was also used to collect information required to identify schools that were used in the non-PLC comparison group. The MCDS portal was searched to find schools with similar demographics to those of the PLC exemplary schools. When searching for comparable demographic schools, no testing scores were viewed. A list of schools and their demographics were compared side-by-side to Missouri PLC exemplary schools to identify the schools that were closest to the PLC exemplary schools in all areas of student and teacher demographics.

Interviews were also conducted with administrators in the PLC exemplary schools. These interviews allowed information to be collected relative to perceptions of the implementation of Missouri PLCs. The interview questions (see Appendix C) were created by the researcher and reviewed by educational colleagues not part of the sample to assure the questions were framed in a clear and concise manner. Interviews were conducted via phone and in person. A recruitment letter (see Appendix D) was utilized when contacting participants. The interview questions were posed as open-ended, allowing for more information to be collected. All interview participants completed the Adult Consent Form (see Appendix E) prior to their interviews.

**Data Collection**

Once approval of the project was granted (see Appendix F), data collection began. Data collection took place in the fall of 2013. The data were collected via the MODESE website for the districts determined to fit the requirements of the research study. Data

collection included two sample groups. One group consisted of Missouri PLC exemplary schools and another group consisted of the non-PLC implementing schools

Utilization of the state of the Missouri MODESE MCDS database removed any bias or assumptions relative to the outcome of this study. This database does not allow for any manipulation of the data (MODESE, 2013). It also allowed access to all of the pertinent information required to fully answer the research questions. In addition, the utilization of this performance assessment data were relevant in analysis as it enabled data analysis to occur at the same time as school administrators and personnel were analyzing MAP data.

The data were analyzed according to the implementation or non-implementation of Missouri PLCs. Districts that were deemed exemplary for the 2010-2011, 2011-2012, and 2012-2013 school years (MODESE, 2013) according to the Benchmark Assessment Tool and Missouri PLC Implementation Rubric comprised the Missouri PLC exemplary group. Data from the non-PLC comparison group were proffered. The two groups were evaluated by the fifth-grade MAP performance test scores in the areas of math and communication arts, utilizing data from the proficient and advanced categories.

The data were utilized to test the hypotheses relative to the study for each respective school year. The data collected were analyzed to determine what difference, if any, existed between the implementation of the Missouri PLC model. These schools' scores were then compared to non-PLC school group. These raw data were utilized to determine if a difference existed through mean scores. An independent *t*-test was then applied to each years' data as well as the data from a compilation of all three years in

each subject area to determine if a statistical significant difference existed between the two groups.

Once the potential interviewees were contacted and agreed to participate in the study, a letter of informed consent and the interview questions were sent electronically. A schedule to conduct the interviews was created and agreed upon by each participant. Interview responses were conducted either by telephone or in person and were audio taped for accuracy. Since the questions were open-ended, the administrators were not bound by constraints and were, thereby, free to offer professional and personal opinions and perceptions about their PLC exemplary schools.

**Data Analysis**

A *t*-test was utilized to identify the statistical significance of the study (Ravid, 2011). This facet of the study identified if a difference existed between the implementation of Missouri PLCs and student performance utilizing data from the Missouri PLC exemplary group and the non-PLC randomly selected group over a three-year period. The independent *t*-test applied to the data either revealed a statistical significant difference or no statistical significant difference.

A significance factor of .01 and .05 on either set of data was used to determine if there was a difference between Missouri PLC implementation through exemplary status and student performance or non-PLC implementation and student performance. This was determined and used to test the hypotheses and to answer the research questions. The significance factor was applied to both the fifth-grade communication arts and math MAP test data as retrieved from the MODESE database.

The research questions and hypotheses were tested after the careful analysis of fifth-grade data. The data were analyzed in two separate areas: math and communication arts over a three-year period. This analysis allowed conclusions to be drawn utilizing the comparison of the data in two areas of student achievement: communication arts and math. Trends were examined based on the data analysis.

Conclusions were drawn relative to the outcomes of the study, based on quantitative data analysis. These data were utilized to determine if a difference existed between the Missouri PLC exemplary school group when compared with the randomly selected non-PLC comparison group student scores. The data were organized into tables and charts in order to provide a clear picture of the significance, or lack thereof, between the implementation of Missouri PLCs and student performance. The information pertinent to districts that do not implement the Missouri PLC model and student performance as indicated by the data analysis were also analyzed, and trends were noted and discussed. Additionally, interview results were synthesized.

The responses from the interviews were analyzed using open and axial coding methods. From the analysis, key words, phrases, and common themes emerged. According to Creswell (2009), “those who engage in this form of inquiry support a way of looking at research that honors an inductive style, a focus on individual meaning, and the importance of rendering the complexity of a situation” (p. 4). This type of research is essential to the outcome of the study by allowing an opportunity for the participants’ voices to be heard.

**Summary**

This research was based on the examination of MAP data to determine if a statistical significance existed between student performance and the implementation of the Missouri PLC model as compared to non-PLC schools. Data were retrieved from the MCDS portal for the 2010-2011, 2011-2012, and 2012-2013 school years. The MAP scores were examined from a sample of fifth-grade students who completed both the math and communication arts tests in the spring of each respective year. Interviews conducted with Missouri PLC exemplary school administrators were utilized to provide more depth to the study by adding perceptions to the quantitative data.

In Chapter Four, these data were analyzed and organized in table format. Areas of specific interest were the percentage of students in both districts scoring in the advanced and proficient areas on the MAP test in the areas of math and communication arts. Additionally, specific interest was given to the results of the *t*-test comparison to analyze and test the hypotheses. Trend charts were created for more successful interpretation of testing results.

## Chapter Four: Analysis of Data

The purpose of this study was to ascertain what difference, if any, existed between the implementation of PLCs in Missouri schools and student achievement as compared to non-PLC schools as evidenced by MAP assessment scores. Proponents of the PLC model and the MODESE PLC project presented the PLC model as a tool to drive school reform (DuFour et al., 2008). While the MODESE and PLC proponents have made claims regarding the effectiveness of PLCs, specifically related to higher student achievement, little research exists in Missouri to back this claim.

In order to ascertain if a difference exists between student achievement and PLC implementation as evidenced by MAP data, the following research questions and hypotheses were utilized in this study:

1. What is the difference in MAP communication arts scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?

2. What is the difference in MAP math scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?

3. What are the perceptions of administrators of Missouri PLC districts regarding the Missouri PLC program and student achievement?

$H1_0$: There is no difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP communication arts scores.

$H1_a$: There is a difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP communication arts scores.

$H2_0$: There is no difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP math scores.

$H2_a$: There is a difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP math scores.

**Communication Arts MAP Data Analysis**

Communication arts MAP data were collected from the MODESE MCDS in the fall of 2013. For the exemplary schools and non-PLC schools, the percentages of fifth-grade students scoring in the advanced and proficient categories were totaled for each of the 2010-2011, 2011-2012, and 2012-2013 school years. The total scores from these two groups for each respective year were then added together and a mean score was calculated. The raw mean scores, derived from the two groupings of Missouri PLC exemplary and non-PLC implementing schools, for each school year were then calculated. One chart was utilized to compile data for each of the three years (see Figure 1). A *t*-test was applied to analyze the statistical difference between the groupings for each year.

Utilizing data retrieved from the MODESE MCDS portal for the 2010-2011 school year, 17 schools met Missouri PLC exemplary status. The communication arts data of students scoring in the proficient and advanced categories on the test were

compared to a randomly selected group of 17 schools that did not have affiliation with the Missouri PLC project. For the 2010-2011 school year, schools that were awarded the Missouri PLC exemplary status scored 6.71% higher than the non-PLC group.

An independent *t*-test was applied to the data to compare the mean scores of the PLC schools and the non-PLC schools for the 2010-2011 school year. No significant difference was found between the means of the two groups ($t(32) = .062$, $p < .05$). The mean of the PLC school group ($m = 61.69$, $sd = 10.90$) was not significantly different from the mean of the non-PLC school group ($m = 54.83$, $sd = 9.94$).

When analyzing data from the 2011-2012 school year, raw mean scores were utilized. The raw mean of the Missouri PLC group scored .9% higher (less than one one-hundredth of a percent) than the non-PLC comparison group. This is the smallest difference in mean scores for students scoring in the proficient and advanced categories of the MAP assessment.

An independent *t*-test was applied to the data to compare the mean scores of the PLC schools and the non-PLC schools for the 2011-2012 school year. No significant difference was found between the means of the two groups ($t(6) = .86$, $p < .05$). The mean of the PLC school group ($m = 53.08$, $sd = 8.70$) was not significantly different from the mean of the non-PLC school group ($m = 52.18$, $sd = 4.57$).

In comparing raw mean scores, fifth-graders in Missouri's PLC exemplary schools in the area of communication arts scored 4.8% higher than their non-PLC implementing counterparts during the 2012-2013 school year. Further analysis of data was conducted using a *t*-test. An independent *t*-test was applied to the data to compare the mean scores of the PLC schools and the non-PLC schools for the 2012-2013 school

year. No significant difference was found between the means of the two groups ($t(6) = .378$, $p < .05$) revealed no significance between the group that implemented the Missouri PLC model ($m = 60.03$, $sd = 6.59$) and the non-PLC comparison group ($m = 55.20$, $sd = 7.71$).

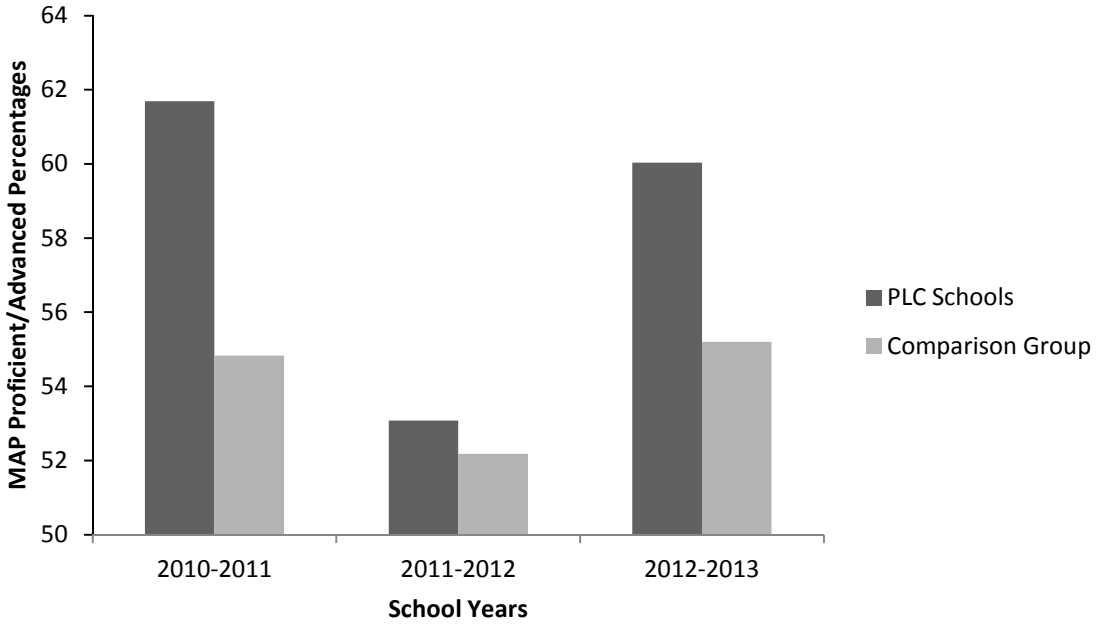



*Figure 1.* Communication arts MAP scores for 2010-2011, 2011-2012, and 2012-2013 for PLC schools and comparison group.

**Math MAP Data Analysis**

Math MAP data were collected from the MODESE MCDS in the fall of 2013. For the exemplary schools and non-PLC schools, the percentages of fifth-grade students scoring in the advanced and proficient categories were totaled for each of the 2010-2011, 2011-2012, and 2012-2013 school years. The total scores from these two groups for each respective year were then added together and a mean score was calculated. The raw mean scores, derived from the two groupings of Missouri PLC exemplary and non-PLC implementing schools, for each school year were then calculated. One chart was utilized to compile data for each of the three years (see Figure 2). A *t*-test was applied to analyze the statistical difference between the groupings for each year.

For the 2010-2011 school year, 17 schools were awarded the Missouri PLC exemplary status. Math MAP scores were then compared to schools that do not implement the Missouri PLC model. The students in Missouri PLC exemplary schools scoring in the proficient and advanced areas of the math MAP test scored 9.2% higher than fifth-grade students who attended non-PLC schools from the comparison group.

An independent *t*-test was used to compare the mean scores of the PLC schools and the non-PLC schools for the 2010-2011 school year. A significant difference was found between the means of the two groups in the area of math ($t(32) = .010$, $p < .05$). For this year, the mean of the PLC school group ($m = 64.59$, $sd = 10.96$) were statistically significantly different from the mean of the non-PLC school group ($m = 55.35$, $sd = 9.26$).

Data analyzed from the 2011-2012 school year showed that the mean score of students scoring in the proficient and advanced areas of the math MAP test revealed the

highest discrepancy in scores. The Missouri PLC group scored 15.1% higher than students in the comparison group. Although this was the largest mean score, no statistical significance was identified.

An independent *t*-test was applied to the data to compare the mean scores of the PLC schools and the non-PLC schools for the 2011-2012 school year. No significant difference was found between the means of the two groups ($t(6) = .137$, $p < .05$) . The difference in mean scores revealed no statistical significance between mean scores of schools that implemented the Missouri PLC model ($m = 60.65$, $sd = 10.72$) and the non-PLC comparison group ($m = 45.55$, $sd = 13.93$).

The Missouri PLC exemplary schools' mean from the proficient and advanced groups and the mean from non-implementing schools were compared for the 2012-2013 school year. Students who attended Missouri PLC exemplary schools scored 9.3% higher on the fifth-grade math MAP test than students in schools that did not participate in the Missouri PLC model. Upon first review of the raw data, it was concluded that students in Missouri PLC exemplary schools scored higher than their non-PLC counterparts by almost 10%.

An independent *t*-test was applied to the data to compare the mean scores of the PLC schools and the non-PLC schools for the 2012-2013 school year. No significant difference was found between the means of the two groups ($t(6) = .149$, $p < .05$). The mean of the PLC school group ($m = 64.35$, $sd = 10.17$) was not significantly different from the mean of the non-PLC school group ($m = 55.05$, $sd = 4.79$).

Although there was only one year in which a statistically significant difference in student achievement was noted, the raw student achievement scores overall were higher, with the highest difference occurring in the 2011-2012 school year. In the area of math, the raw achievement scores were much higher than that of the communication arts scores for all three years of data analysis. A conclusion was made that Missouri PLC implementation did have an effect on student achievement when compared with the non-PLC school group, as evidenced by comparing the raw mean scores of the two groupings. This difference, however, did not exist within a statistical significance for two of the three years.

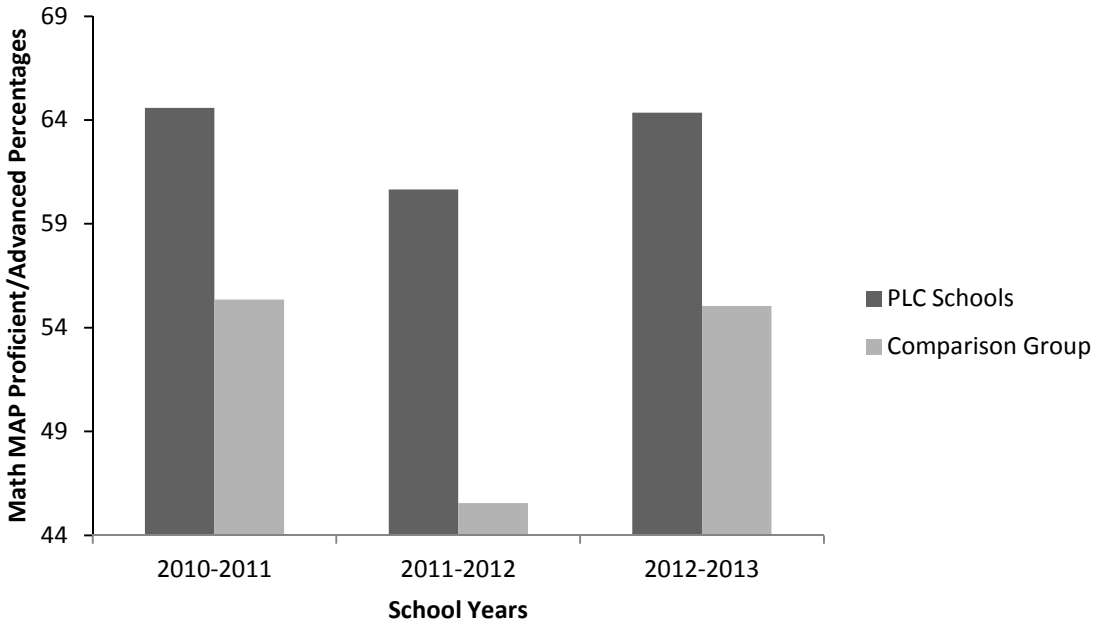



*Figure 2.* Math MAP scores for 2010-2011, 2011-2012, and 2012-2013 for PLC schools and comparison group.

**Three-Year Data Analysis: Communication Arts**

The data that were analyzed separately for each of the 2010-2011, 2011-2012, and 2012-2013 calendar years were then compiled and an analysis was made relative to the findings of the data as a whole (see Figure 3). Using three years of data served to solidify conclusions drawn from this study. The mean scores for communication arts data over the three-year period were analyzed from the Missouri PLC exemplary group. The data were also analyzed from the comparison group for the respective years. The data were then compared to the non-PLC group utilized for the same three-year period.

The mean score of the Missouri PLC exemplary group for the three-year period in the area of communication arts was 58.27%. The mean score of the comparison group for the three-year period in the area of communication arts was 54.07%. Fifth-grade students who attended Missouri PLC exemplary schools raw mean scores were 4.2% higher than students who did not attend Missouri PLC schools on the MAP communication arts assessment over the three-year period.

An independent *t*-test was applied to the data to compare the mean scores of the PLC schools and the non-PLC schools for the 2010-2011, 2011-2012, and 2012-2013 school years. No significant difference was found between the means of the two groups ($t(44) = .209$, $p < .05$). The data reveal no significance between the mean of the Missouri PLC exemplary school group ($m = 58.27$, $sd = 4.57$) and the mean of the non-PLC school group ($m = 54.07$, $sd = 1.65$). in the area of communication arts.

The null hypothesis was not rejected. A statistical difference in student scores was not found between Missouri PLC implementing schools and the non-PLC

comparison group. Additionally, the alternative hypothesis was not supported for the three-year data period.

The difference in MAP communication arts scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model is 4.2%. Mean scores of students in Missouri PLC exemplary schools scored higher than mean scores of students in the non-PLC comparison group. While a difference of 4.2% does exist between schools that implement the Missouri PLC model as compared with those schools that do not, no statistical significance exists.

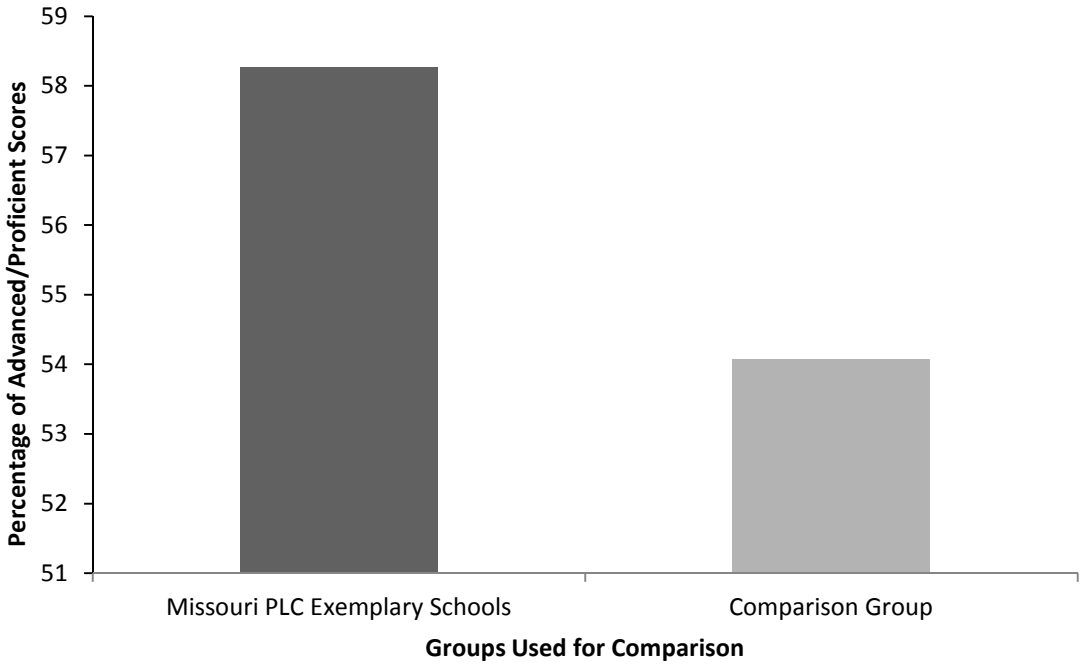



*Figure 3.* Percentage of students scoring in the advanced and proficient categories over a three-year period on the communication arts MAP test.

**Three Year Data Analysis: Math**

The data analyzed for the 2010-2011, 2011-2012, and 2012-2013 school years were then utilized to render a three-year data analysis. The data retrieved from fifth-grade students scoring in either the proficient or advanced areas of the math MAP assessment were compared with the scores from the comparison groups. The comparison group consists of fifth-grade student achievement data retrieved from the Missouri MODESE website and consists of randomly selected schools that are similar in size and demographics to those schools identified as Missouri PLC exemplary schools for each of the three school years.

The student achievement data were analyzed in the area of math. Students scoring in either the proficient or advanced sections of the math MAP assessment and belonging to Missouri PLC exemplary schools over the three-year period were 63.20% of the total student population. In contrast, 51.98% of students scoring in the proficient or advanced sections of the MAP test came from the non-PLC implementing comparison group. Students who attended Missouri PLC exemplary schools scored 11.22% higher than students from the comparison group over the three-year period (see Figure 4).

An independent *t*-test was applied to the data to compare the mean scores of the PLC schools and the non-PLC schools for the 2010-2011, 2011-2012, and 2012-2013 school years. A statistically significant difference was found between the means of the two groups ($t(44) = .032$, $p < .05$). The data reveal a statistically significant difference between the mean of the Missouri PLC exemplary school group ($m = 63.20$, $sd = 2.21$) and the non-PLC school group ($m = 51.98$, $sd = 5.57$). Compiling the data from three years revealed a statistical significance in overall mean scores.

The data collected and analyzed in the area of math rejected the null hypothesis. A difference in student scores of 11.22% difference in raw mean scores was found between Missouri PLC implementing schools as compared with those that do not implement the Missouri PLC model. Additionally, the alternative hypothesis was supported. A statistical significant difference was found between schools that implemented the Missouri PLC model as compared with those schools that did not implement the model in the area of math.

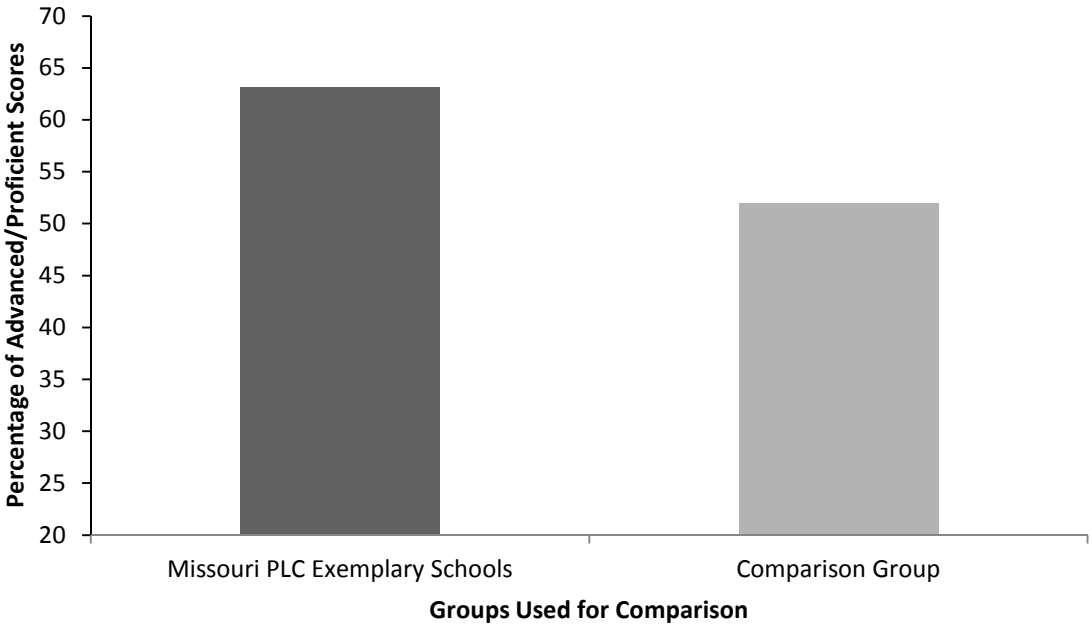



*Figure 4.* Percentage of students scoring in the advanced and proficient categories over a three-year period on the math MAP test.

**Multi-Year Exemplary School**

One school, found by inquiry to the Missouri MODESE website, was found to have been awarded exemplary status through the Missouri PLC Benchmark Assessment Tool and Missouri PLC Implementation Rubric for two consecutive years. This school was awarded exemplary status for the 2010-2011 and 2011-2012 school years. This school was not awarded Missouri PLC exemplary status for the 2012-2013 school year. Data were obtained relative to student scores in the advanced and proficient areas of both math and communication arts over the last three years, including the most recent school year that the district was not awarded Missouri PLC exemplary status.

The data revealed that in the school's first year of Missouri PLC exemplary status, 50.6% of fifth-grade students scored in the advanced and proficient levels of the communication arts MAP assessment. The following school year, in which they were also awarded PLC exemplary status, only 47.1% of students scored in the top two tiers of the MAP assessment. The 2012-2013 MAP data results revealed that 44.3% of students scored in the advanced or proficient levels of the MAP test (see Figure 5).

The data utilized with this PLC exemplary school did not allow for conclusions to be drawn relative to a difference between student achievement and Missouri PLC exemplary status. A downward trend was noted. The school's communication arts scores over the three year period did not reveal a trend in which PLC exemplary status and student achievement were concurrent. It should be noted that the data were consistent with the Missouri PLC exemplary status requirements, which included deep levels of implementation and high student achievement trends.

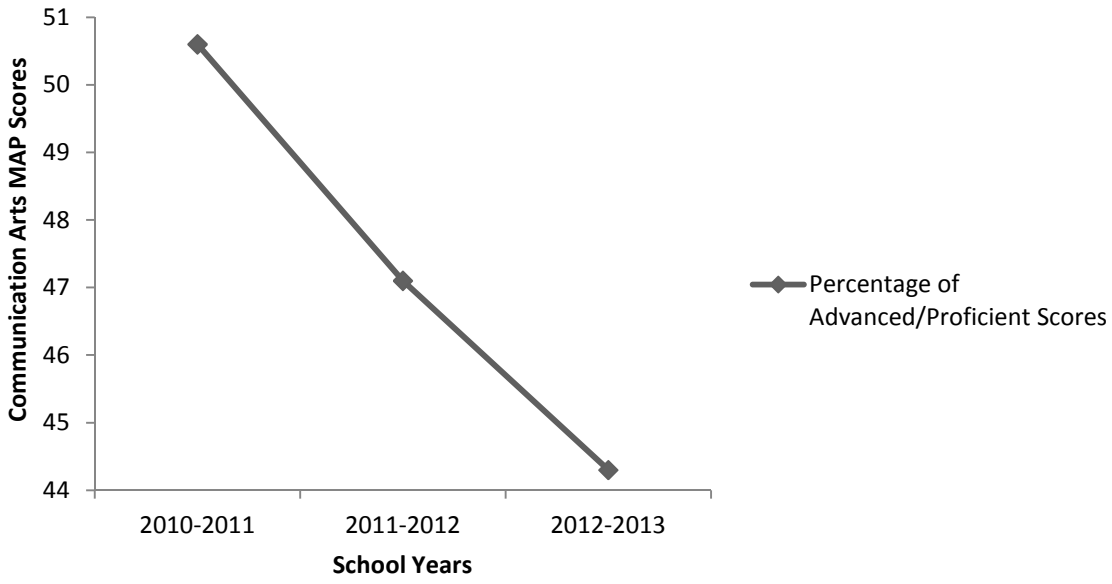



*Figure 5.* Multi-year PLC exemplary school trend over a three-year period.

This Missouri PLC exemplary schools' data for fifth-grade students in the area of math were also analyzed using MAP data. The data revealed that in the 2010-2011 school year, 51.1% of fifth-grade students scored in either the advanced or proficient areas of the MAP test. In the following school year, 55.2% of students scored in the advanced or proficient areas of the test. In the 2012-2013 school year, the same year the district was not awarded Missouri PLC exemplary status, only 36.7% of students scored in the advanced and proficient areas of the MAP assessment (see Figure 6).

The data, when graphed, indicated an upward trend between PLC exemplary status and student achievement during the first two years of PLC exemplary status. A sharp decline in fifth-grade students scoring advanced or proficient occurred in the third year of implementation. It was concluded that the lowest scoring year for this particular

school was also the same year that this school lost its Missouri PLC exemplary status. All three years, when analyzed collectively, showed a downward trend in student achievement according to the state's MAP testing, which also coincided with the school year the district was not awarded Missouri PLC exemplary status.

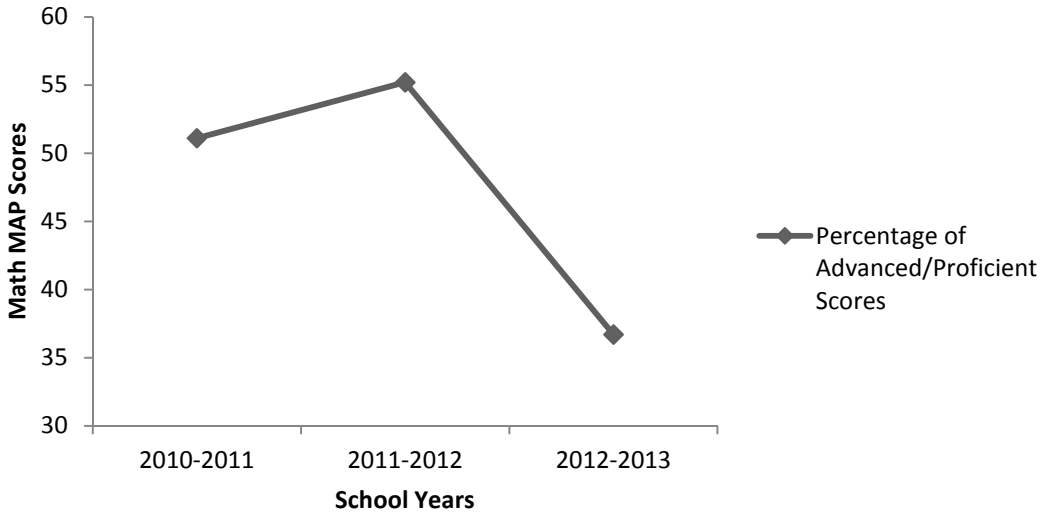



*Figure 6.* Multi-year PLC exemplary school math trend over a three-year period.

**Interview Results**

Interviews were conducted via phone and in person with administrators of schools that were awarded exemplary status through the Missouri PLC project's Benchmark Assessment Tool and were deeply implementing Missouri PLCs as evidenced by the Missouri PLC Implementation Rubric. The questions that were asked are synthesized in the following paragraphs. The purpose of the interview questions was to gain greater insight as to the perceptions of current administrators relative to the impact they believe PLCs have within their schools on student achievement. The following is a review of interview questions and responses by administrators in buildings that were awarded Missouri PLC exemplary status.

One intermediate school administrator attributed all of the schools gains in student achievement to Missouri PLCs. This administrator shared that every endeavor the school undertakes academically is thoroughly discussed and integrated into the curriculum through the vehicle of PLC teams within the building. Weekly early release times allowed educators to be in constant collaboration relative to student learning needs. Another school administrator shared that not only did the school's PLCs drive student achievement; they had also made a positive impact on the building climate.

This change, through the implementation of the Missouri PLC model, had in-turn transferred the workplace into more of a family atmosphere. This administrator shared that when you are in a family, you are more likely to help one another, share ideas with each other, and have higher collective goals than when working independently. One small rural school administrator shared that the districts journey with PLCs began when the necessity for a common writing tool and rubric were identified. Since beginning

Missouri PLC implementation, faculty and staff at this school saw a need and then focused on raising student achievement in the area of writing. This all transpired as educators at all levels participated in school improvement discussions. This endeavor elicited academic gains in all other areas as a result of the schools efforts.

The formation of one PLC placed one exemplary school ahead of the pack in its geographic area. This school was the first to implement PLCs, and through the implementation of PLCs, brought RtI into practice. This administrator shared that the global view of the school changed with the implementation of PLCs. This school went from embodying an individualized view on education and grade-level instruction to viewing the success of the building as a whole.

Another positive change noted was the team approach in academics and decision making. Administrators attributed several programs that have aided in climate, character, and academics to the implementation of PLCs within their buildings. Each program began as an idea verbalized within the PLC team setting.

Another Missouri PLC exemplary school administrator shared that trends in data are positive. This particular building had experienced increases in communication arts and math student achievement scores in 3rd - 5th grades, as well as in all subgroups. This increase was attributed to collaboration regarding teacher practices that are and are not working. This information was then utilized to problem solve as a team and create solutions based on needs surveys completed by team members.

Students who were performing at different levels were evaluated in order to meet specific needs. The use of effective student feedback for one building (brought about through PLCs) enabled one school to create opportunities for responsibility and

individualized goal-setting both for students and educators. Students were taking a more active role in their own education through the personal identification of areas of strength and weakness. Educators, in turn; focused on efforts of personal goal setting, which elicited an environment filled with opportunities for personal improvement. These goals positively impacted a struggling school.

One administrator relayed that teaching practices had changed as a result of the implementation of Missouri PLCs. For example, communication arts and math lessons were created in order to be responsive to student needs. Formative assessment became a guide for lesson planning and curriculum needs. This administrator felt that core instruction with the adoption of learning targets, objective-based grading, and essential learner outcomes have benefited the teaching staff.

With the implementation of these practices, more differentiation to meet student needs was evident in classrooms. This district also implements RtI practices within the core subject areas. Another administrator shared that consistent, effective feedback given to students has promoted student self-assessment and evaluation relative to meeting standards and goals. The charge to promote student responsibility has pushed students to achieve higher than ever expected.

Administrators also saw the impact in student achievement trends to be positive as implementation progressed from year to year. Students from one Missouri PLC exemplary school have been working towards concept mastery. Allowing educators to collaborate on a regular basis had impacted achievement by looking at individual students in a more in-depth fashion.

With the added time for targeted collaboration time to attain higher student achievement, educators had been able to bring higher quality instruction tailor-made to student deficiencies. This directly impacted student achievement in the core areas, as evidenced by the increase in MAP scores. One administrator noted that the core areas focused upon during PLC time had seen steady increases, and core areas that were not the focus had seen decreases. He stressed that teams should not neglect one area, but spend focused time on each core area within the PLC setting.

Exemplary school administrators noted that scheduling time dedicated solely to the PLC process plays a major role in program success. The teacher collaboration schedule varies for buildings implementing the Missouri PLC model. In one district, students have late start Mondays. Educators come in early and utilize this time each Monday morning. At this time, grade-level teachers met with all other educators and support staff in order to plan instruction. Interventionists and Title I personnel serve an integral part in this weekly collaboration.

One exemplary school administrator shared that having both grade level and team PLC collaboration times scheduled greatly benefitted the school by allowing for both focused and broad goal setting and decision-making times. Additionally, administrators shared that community involvement when creating the PLC schedule was essential to the creation of a school calendar conducive to student learning and achievement. Community members also supported a four day school week to allow for this collaboration time.

All Missouri PLC exemplary school administrators served in different capacities to facilitate their buildings' PLCs. Interview questions revealed that administrator roles vary widely in Missouri PLC exemplary school buildings. Some play a more active role, while others participate at an oversight level. One administrator reported that some duties include visiting meetings and reviewing PLC notes that are turned in by teams. Some teams in other districts report weekly or monthly for review through building administration.

Another interviewee stated that he plays an integral role through the PLC process, and through efforts aligned with the leadership team, presents professional development to the PLC groups. Some programs started through this process were RtI, Positive Behavior Intervention Supports, and the directed efforts to include more after school activities and programs. One administrator noted that promoting shared leadership within the building created an environment where team members were active, involved, and were able to utilize their strengths to benefit the whole.

The allotment of teacher collaboration time was essential to the PLC process. One administrator stated that the building's clear expectations regarding what planning time should look like enabled staff to remain focused in order to obtain higher student achievement. Some schools require educators to meet weekly in their grade-level PLC during one planning period in addition to the weekly allotted PLC collaboration time. Another administrator shared that without weekly and monthly PLC and professional development time, the programs, growth, and success experienced by the building would not have happened.

One PLC exemplary school administrator described a complete change in climate relative to educators having common planning times and periods set aside solely for the team PLC process. During these meetings, educators had the opportunity to work on student learning goals. Educators were also able to form differences with one another that encouraged sharing best practices and discussions relative to student needs and concerns.

Exemplary schools were in various years of implementation and had different ideas relative to what the future held for their buildings relative to PLC implementation. One respondent reported that essentially, every day, week, month, and year, are works-in-progress. Other building administrators noted they were working towards a more systematic RtI approach. One administrator conveyed that more weekly collaboration time was a work-in-progress for that particular building. A different administrator shared about struggles faced when providing training for new faculty members and how incorporating them into the team process as a contributor was a challenge.

Missouri PLC exemplary school administrators faced many challenges when implementing and facilitating the PLC process in their buildings. The biggest challenge shared by administrators was the change in staff that occurs yearly. This challenge was addressed by the school offering new educator training provided by the school's PLC leadership team. A mentoring program in this district was created to ensure that educators new to the school had opportunities to visit classrooms where collaborative learning was taking place.

Another hurdle shared by one building administrator is that sometimes, Missouri RPDC trainers gave unclear advice relative to implementation and how to reach school-wide deep implementation. This lack of explicit instruction for implementing districts didn't always meet the specific needs of buildings in which Missouri PLCs are being implemented. Another administrator shared that the use of a common language between educators and students in grades K-12 was a huge hurdle that the building was able to overcome through efforts made during PLC time.

**Summary**

In conclusion, the three-year data analysis revealed there was not a statistical significant difference between Missouri PLC implementation and student achievement in communication arts. This was apparent through the analysis of fifth-grade communication arts MAP mean score data results from Missouri PLC exemplary schools and fifth-grade mean score student achievement data from districts that do not implement Missouri PLCs. The null hypothesis was not rejected, and the alternative hypothesis was not supported.

In the area of communication arts, a 4.2% difference in raw data were found. Through the raw data results, it was concluded districts that implement Missouri PLCs are more likely to have higher achievement than those districts that do not implement Missouri PLCs. This, however, does not represent a statistically significant difference.

In the area of math, the three-year data analysis confirmed there was a difference of 11.22% between mean student achievement scores as evidenced by data collected from fifth-grade populations on the math MAP test and Missouri PLC implementation as compared with mean scores of schools that do not implement Missouri PLCs. The results

from the *t*-test indicated there was a statistically significant difference in student achievement between the Missouri PLC exemplary schools and the non-PLC schools when comparing the two groups' mean math scores. The null hypothesis was rejected, and the alternative hypothesis was supported.

The following chapter addresses a summary of the study in its entirety. Research questions and hypotheses are discussed, and the findings of the data analysis are summarized. Conclusions are made relative to the outcome of the study. In addition, gaps found while completing the research are addressed. Implications for practice are presented. Recommendations for future research in the area are also discussed. This research provided conclusive evidence of the importance of the study when applied to the state of Missouri and districts considering the implementation of Missouri PLCs.

# Chapter Five: Summary and Conclusions

The purpose of this study was to determine what difference existed between the implementation of Missouri PLCs and student achievement. This study was completed through the analysis of communication arts and math data collected from fifth-grade students of Missouri PLC exemplary schools. Schools with similar characteristics and demographics that were not affiliated with the Missouri PLC project were used as the comparison school group.

A *t*-test was applied to the communication arts mean scores of the two groups, and then the math mean scores of the two groups to determine what difference, if any, existed between the Missouri PLC exemplary schools and those schools that no not have Missouri PLC affiliation. These data were collected for the 2010-2011, 2011-2012, 2012-2013 school years. The scores from the total of the three years were then calculated to determine the mean. A *t*-test was then applied. Additionally, interviews were conducted with administrators of the Missouri PLC exemplary schools to gain perceptions to aid in the findings of the study.

Findings relative to the study are discussed in detail. Pertinent information brought about through the completion of the study are addressed. Conclusions drawn from the completion of the study are discussed. Additionally, implications and the need for future research are identified and addressed.

## Findings: Communication Arts

In the area of communication arts for the 2010-2011 reporting year, data revealed that students who attended Missouri PLC exemplary schools scored 4.2% higher on the MAP test than students who did not attend Missouri PLC exemplary schools. A *t*-test

was applied to test for statistical significance. The *t*-test failed to indicate a strong difference between student achievement and Missouri PLC implementation for this particular year.

Utilizing data retrieved from the 2011-2012 school year, the Missouri PLC exemplary school group was compared to a like-demographic non-PLC school group. In the area of communication arts, fifth-grade students who were in the Missouri PLC exemplary school group scored .9% higher than the non-PLC comparison group. It is important to note that these were the only data included in this study that revealed a non-conclusive difference between student achievement and Missouri PLC implementation. In communication arts, there was no statistical significant difference between Missouri PLC exemplary status and student achievement.

An independent *t*-test was applied to the data to assess statistical significance. A significance factor of .05 and below revealed no statistical difference between mean student achievement scores and Missouri PLC implementation. The lowest mean difference was only found for the 2011-2012 school year when seeking to determine if a difference existed between student achievement and Missouri PLC implementation. One could attribute these findings to the smaller number of Missouri schools achieving Missouri PLC exemplary status.

In the area of communication arts for the 2012-2013 school year, students who attended Missouri PLC exemplary schools scored 6.8% higher in the advanced and proficient areas than the comparison schools. The total group's mean scores in communication arts were compared via independent *t*-test. The results showed there was no statistical significant difference found between student achievement and PLC

implementation. Although mean scores from the PLC group were higher, the difference was not statistically significant.

While overall scores of Missouri PLC exemplary schools in communication arts were greater than the comparison group, these scores were lower overall than math MAP scores for the same groupings. There could be many factors that precipitated this discrepancy within the data between the two curriculum areas, dependent on the specific schools from which these data were analyzed. More information was needed to draw further conclusions relative to these data sets.

Moreover, the three-year data analysis revealed a difference of 4.2% in mean scores between fifth-grade student scores in the area of communication arts between the Missouri PLC group and the non-PLC group. These data, as evidenced by the *t*-test, determined the decision to not reject the null hypothesis. Additionally, the alternative hypothesis was not supported.

**Findings: Math**

MAP data for fifth-grade students in the Missouri PLC exemplary and comparison groups for the 2010-2011 school year revealed that a difference existed between student achievement and Missouri PLC implementation. Students who attended Missouri PLC exemplary schools scored 9.2% higher on the MAP math test than the non-PLC comparison group. The independent *t*-test results indicated a statistical difference between the mean student achievement scores in math when comparing the Missouri PLC exemplary group with the non-PLC group for this specific year.

Data were also analyzed for the 2011-2012 school year using the Missouri PLC exemplary school group and comparing it with a randomly selected group of like-

demographic schools. The data revealed that fifth-grade MAP math data from the Missouri PLC exemplary group was 15.1% higher than the comparison group. A *t*-test was applied to these groups to determine if a statistical significance existed between Missouri PLC implementation and student achievement. No statistical significant difference was found between Missouri PLC implementation and student achievement mean scores for this specific year.

For the 2012-2013 school year, fifth-grade math student scores were compared between Missouri PLC implementing schools and the comparison group. The data analysis revealed that the mean math score of students in Missouri PLC exemplary schools (9.3%) was higher than non-PLC implementing schools in the advanced and proficient range of the MAP test. When a *t*-test was applied to the mean scores of students scoring in the advanced and proficient areas of the test, no statistical significant difference was found.

When utilizing all math data from the two groups over a three-year period, data revealed that Missouri PLC exemplary schools scored a difference of 11.22% higher on the math MAP test than the comparison group. This provided an answer to the second research question. These data retrieved from fifth-grade students' mean scores showed a significant difference between student achievement in Missouri PLC exemplary schools and non-PLC schools. The null hypothesis was rejected, and the alternative hypothesis was supported when combining mean score data from the three-year period in the area of math.

The content area of math was by far where the biggest discrepancies were found between Missouri PLC schools and non-PLC schools. Larger gains in student

achievement were found relative to mean math MAP scores within districts that implemented the Missouri PLC model; although, the mean MAP math scores were higher in both the Missouri PLC and comparison groups than communication arts scores.

One Missouri school that had attained PLC exemplary status for concurrent years was found to have met the Benchmark Assessment Tool and Missouri PLC Implementation Rubric criterion, and then did not meet the criterion when MAP scores dropped. This trend cannot be attributed solely to Missouri PLC exemplary status, as the Benchmark Assessment Tool and Missouri PLC Implementation Rubric findings for that school for that year were not shared. It can be concluded, that the school, while reaching Missouri PLC exemplary status for the prior two years, did so by meeting the strenuous requirements set forth by the Missouri PLC project's Benchmark Assessment Tool.

**Findings: Interviews**

To gain more insight relative to the perceptions of administrators in PLC exemplary schools, interviews were conducted. Administrators of Missouri's PLC exemplary schools resoundingly agreed that the implementation of the Missouri PLC project in their schools had a profound effect on student achievement. These perceptions were based on the foundational pillars of the PLC processes, including dedication to PLC norms, constant, meaningful collaboration, and change through the PLC process intermittingly when programs or efforts toward student achievement were not producing desired results.

Through Missouri PLC exemplary school administrator interviews, perception that Missouri PLCs had a direct impact on student achievement was unanimous. Administrators attributed the increases in student achievement to the efforts of time

educators spend collaborating through the PLC process. One administrator mentioned that the fifth-grade teachers spend time utilizing common assessments to indicate the direction of where teaching will go for the following week. The use of common assessments has also allowed educators to strategically group students to better meet their needs as diverse learners.

Interviews conducted with administrators of Missouri's PLC exemplary schools brought to light a very common belief system inherent within all of the Missouri PLC exemplary schools. At the heart of the PLC implementing schools is the same foundational belief that collaboration should occur weekly to garner and gauge the success of the educational process (Garmston & Zimmerman, 2013). These interviews also show that administrators played an integral role in the instructional leadership of their schools, and that much of this was done through the allotted weekly PLC time.

**Research Questions and Hypotheses**

*RQ1. What is the difference in MAP communication arts scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?*

Based on the analysis of data, there was not a statistical significant difference in the fifth-grade scores in communication arts between the PLC and non-PLC schools over a three-year period. No significant difference was found between the means of the two groups ($t(44) = .209$, $p < .05$). The data reveal no significance between the mean of the Missouri PLC exemplary group ($m = 58.27$, $sd = 4.57$) and the mean of the non-PLC schools ($m = 54.07$, $sd = 1.65$). in the area of communication arts. The null hypothesis was not rejected: $H1_0$: There is no difference in student performance between districts

that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP communication arts scores.

*RQ2: What is the difference in MAP math scores for fifth-grade students in Missouri districts that have adopted the Missouri PLC model as compared to those that have not adopted the Missouri PLC model?*

Based on the analysis of data, there was a statistical significant difference in the fifth-grade scores in math between the PLC and non-PLC schools over a three-year period. A statistically significant difference was found between the means of the two groups ($t(44) = .032$, $p < .05$). The data reveal a statistically significant difference between the mean of the Missouri PLC exemplary group ($m = 63.20$, $sd = 2.21$) and the non-PLC group ($m = 51.98$, $sd = 5.57$). The null hypothesis was rejected: $H2_0$: There is no difference in student performance between districts that have adopted the Missouri PLC model and those that have not as evidenced by comparing MAP math scores.

*RQ3: What are the perceptions of administrators of Missouri PLC districts regarding the Missouri PLC program and student achievement?*

Based on PLC administrator interviews, conclusions were drawn that supported the implementation of PLCs as a tool to generate higher student achievement. Administrators overwhelmingly attributed gains in student achievement to the processes that transpired within the PLC setting. Administrators' professional and personal perceptions indicated strong attributions in student achievement gains to the schools' PLC implementation.

**Conclusions**

The data analysis and information retrieved for the completion of this study revealed a statistically significant difference did not exist between the implementation of PLCs, specifically, Missouri PLCs and student achievement, in the area of communication arts. This was identified by utilizing data from districts that have achieved the highest ranking in the state according to the PLC Benchmark Assessment Tool and Implementation Rubric and comparing them with like-demographic districts that do not implement the PLC model. However, there was overwhelming support of the Missouri PLC process and implementation by administrators of Missouri's PLC exemplary schools.

In agreement with the interview outcome of this study is the claim that PLCs are a tool that should drive staff development (Avillion, 2008), thus positively impacting student achievement. Within the Benchmark Assessment Tool, one area measured is the focus of the PLC on student achievement (MODESE, 2013). There are key questions asked within the PLC setting which include: What do we want our students to know? What do we do when they know it? What do we do when they are having difficulty with the concept? (DuFour et al., 2002) These questions serve as a foundation in which educators can address student learning needs as a collaborative unit. Student work and performance are discussed and solutions sought as to how to bring about mastery learning (Yendel-Hoppel, 2010). In addition, educators are able to view the work and create plans for students when learning is not taking place as desired.

The data analysis and information retrieved for the completion of this study revealed that in short, a statistically significant difference did exist between the

implementation of PLCs, specifically, Missouri PLCs and student achievement in the area of math. This was identified by utilizing data from districts that have achieved the highest ranking in the state according to the PLC Benchmark Assessment Tool and Implementation Rubric and comparing them with like-demographic districts that do not implement the PLC model. Additionally, there was overwhelming support of the Missouri PLC process and implementation by administrators of Missouri's PLC exemplary schools.

PLC implementation should be associated with student achievement if districts are interested in whether or not their PLC is effective. This is completed routinely when PLC groups meet to discuss areas of strength, weakness, and seek to improve instruction based on what students are learning (DuFour & Fullan, 2013). The effective PLCs, as evidenced through the research findings, constantly seek improvement within themselves, thus having a positive impact on student achievement (DuFour & Fullan, 2013).

The data from one school district in particular were analyzed as it had achieved the status of Missouri PLC exemplary status for two consecutive years. This school showed growth and met state AYP requirements as evidenced through data obtained through the MODESE website. The fifth-grade population that was used for data-analysis was found to have lost ground in overall student achievement.

While this fifth-grade data showed decline, it should also be noted that the overall achievement in the school showed gains. One conclusion drawn from this study is to further research in the area. More grade level data should be analyzed to provide a more encompassing picture of the true PLC culture within the school.

## Implications for Practice

**Research.** One issue raised through the research process was the fact that few pertinent studies were conducted that addresses the impact that PLCs have had on student achievement. When state educational departments champion a change in educational practices, it is imperative that the claim is backed by thorough research. In the state of Missouri, little research has been conducted on a large scale to determine if implementing PLCs works for Missouri schools. It would behoove the MODESE to conduct large-scale research projects to back programs, such as PLCs, that the state supports. Longitudinal studies following schools through their PLC journeys could create information pertinent to those interested in adopting and implementing the program.

One way to further the development of these programs is to conduct state-wide research using the tools the state has provided, such as the Missouri Benchmark Assessment Tool, to gauge program effectiveness. While some schools regard research through the All Things PLC website, others would be more willing to implement Missouri PLCs if the research compiled was closer to home in the state of Missouri.

The state could create yearly data charts that show the progress of schools that implement the Missouri PLC process. This information could then be disseminated to districts through the Regional Professional Development venues to schools. At this time, the only vastly publicized venue for Missouri PLCs occurs at the yearly Powerful Learning Conference. Other state sponsored programs that were pushed and are now being discarded by districts should prompt this research in order to justify the implementation of Missouri PLCs within the state's boundaries.

To further the research proposed above, data relative to Missouri PLC project implementing schools could be categorized into classes. For example, small, rural schools would receive greater benefits from case studies and data revealed from other like-demographic schools. Additionally, administrators from larger schools could realize more valid implications for practice when reviewing case studies of larger districts. This information could be easily categorized in order to provide more efficient, meaningful information relative to a school's specific needs.

To further categorize research retrieved from Missouri PLC implementing schools, grouping data should be considered by years of implementation as well. A new school implementing the process would benefit greatly from the expertise of like-demographic schools further along in the process. This would provide an excellent network of support for schools in every stage of implementation.

**Awareness.** One great conundrum faced by school leaders is the lack of knowledge regarding some state run programs and venues. One implication for practice would be to provide free training or informational meetings at the regional level to school district administrators and team leaders that are considering Missouri PLC implementation. For example, an administrator seeking to implement PLCs in a small rural school faces many challenges. Budgetary issues arise. Many districts may not be able to afford the cost of bringing in a trainer to provide insight as to implementation steps, foundational necessities, and continued support.

While one can find a multitude of evidence of successful PLC implementation steps, it helps to have a coach or trainer available for questions faced during the process (Larson & Kanold, 2012). Additionally, the state could spotlight exemplary schools,

encouraging other school administrators to visit these schools if considering implementation. A mentor program could be created for like-demographic schools in various regions, and yearly meetings could take place for schools new to the PLC process.

**Implementation.** To correctly and fully implement PLCs in any district, one must seek to overcome obstacles. One such obstacle is scheduling. Scheduling time for weekly teacher collaboration affects the entire school community. All stakeholders are impacted when such decisions transpire. Often times, the community does not understand the time for this weekly collaboration, nor understand its importance. When seeking to create an early release time, district administrators would benefit from the successes and failures of those who have traversed before when communicating with stakeholders.

Additionally, the faculty and staff should have complete buy-in when implementing this process. PLC teams are only as effective as the weakest member. The need for a PLC mentoring program is essential to successful program growth. The PLC process does not occur overnight (Graham & Ferriter, 2009).

Resources available for schools at all levels that are readily available would help the process succeed through its implementation and provide and promote continued success. State specific resources would provide districts with more pertinent information when beginning the process of implementing PLCs within their schools or districts. These resources would allow educators to focus on Missouri initiatives. Additionally, schools that do not have adequate support through the beginning stages will be less-likely to stay the course of PLCs without some type of support and resources available.

**Recommendations for Future Research**

As the PLC program grows in the state of Missouri, further research is needed as changes are made throughout the state. With the implementation of the new Missouri Learning Standards, new research is critical to ensure that the Missouri PLC process offers support relative to changes in state- mandated testing. This research would benefit Missouri schools implementing the Missouri Learning Standards. Districts are currently faced with a different state assessment, and time for collaboration regarding expectations and changes in curriculum are essential to successful district and school performance (Fisher & Frey, 2013).

Research could include how schools that implement the Missouri PLC model are altering strategies to meet the new state standards. The need for this type of research is imperative as it seeks to establish the role PLCs can play in new state standard and assessment implementation (Fisher & Frey, 2013). Are schools that have implemented Missouri PLCs performing better on the new state assessment? Another question that could be answered through the suggested research could focus on whether or not changes made through the new state assessment and the incorporation of technology have been more streamlined due to PLCs that already exist within the school setting (Larson et al., 2013).

Research could take place through surveying all Missouri schools relative to questions that arise as new testing procedures are incorporated, allowing for more regional professional development, and offering round-table discussions with districts that consistently implement Missouri PLCs and see gains in student achievement. A *t*-test could be run to identify if a statistical significance exists between achievement on the

new state assessment and PLC implementation. Additionally, a survey could be included to garner perceptions by administrators and school leaders relative to the impact Missouri PLCs have on implementing the new standards and assessments.

Additional research could be conducted within each respective school district that implements the Missouri PLC model. These districts could be followed from year one implementation to current day. Trends could be noted and charted regardless of PLC exemplary status.

Tools used to improve student achievement within the districts PLC could be utilized to provide a basis for this type of study. Longitudinal studies utilizing the Benchmark Assessment Tool and Missouri PLC Implementation Rubric would provide a common measurement from which to retrieve data. Additionally, this would provide research more pertinent to the daily needs of each respective Missouri PLC school district.

**Summary**

The purpose of this study was to identify what difference, if any, existed between student achievement and PLCs in the area of communication arts on the MAP test. In the area of communication arts, the three-year data analysis did not reveal a statistical significant difference between the two groups. The null hypothesis was not rejected, and the alternative hypothesis was not supported. The study revealed that in the area of communication arts, schools that implemented Missouri PLCs showed higher mean scores in student achievement within fifth-grade populations than schools that did not implement Missouri PLCs. While a difference was noted between Missouri PLC

implementation and student achievement as evidenced by the mean MAP test results, these data were not statistically significant.

A raw mean difference existed between the Missouri PLC exemplary school group and the non-implementing group in the area of math. The *t*-test applied to the three-year data retrieved from the MCDS portal rejected the null hypothesis as there was a statistical difference between student achievement and PLC implementation in math. The overall *t*-test indicated a statistical significant difference between student achievement and Missouri PLC implementation. A mean difference of 11.22% was found between MAP fifth-grade assessment mean scores with schools that implemented the Missouri PLCs as compared with mean scores of schools that do not have affiliation with the Missouri PLC program.

To further validate the findings of the research, administrators from Missouri PLC exemplary schools were interviewed to garner perceptions relative to Missouri PLC implementation and its impact on student achievement. The interview process yielded conclusions that administrators of Missouri PLC exemplary schools attribute gains in student achievement in the areas of communication arts and math to the existence of PLCs within their schools. Some administrators received support from their respective Missouri PLC RPDCs at the infancy of PLC implementation.

Other school administrators shared that they began the PLC process on their own and had recently become affiliated with the Missouri PLC program. These administrators were pleased with the information and support provided through the Missouri PLC program. All administrators interviewed attributed student achievement success in their

buildings to the implementation of effective PLCs. Moreover, efforts to sustain and grow the Missouri PLC program within their schools were active.

The research collected through the completion of this study identified a lack of baseline research regarding Missouri PLCs and their impact on student achievement. The need for more research involving Missouri PLC implementation is essential to properly developing this state supported program. A full-state evaluation of schools that are participants in the Missouri PLC process and their gains made through the PLC process would add value to the implementation of the program throughout the state.

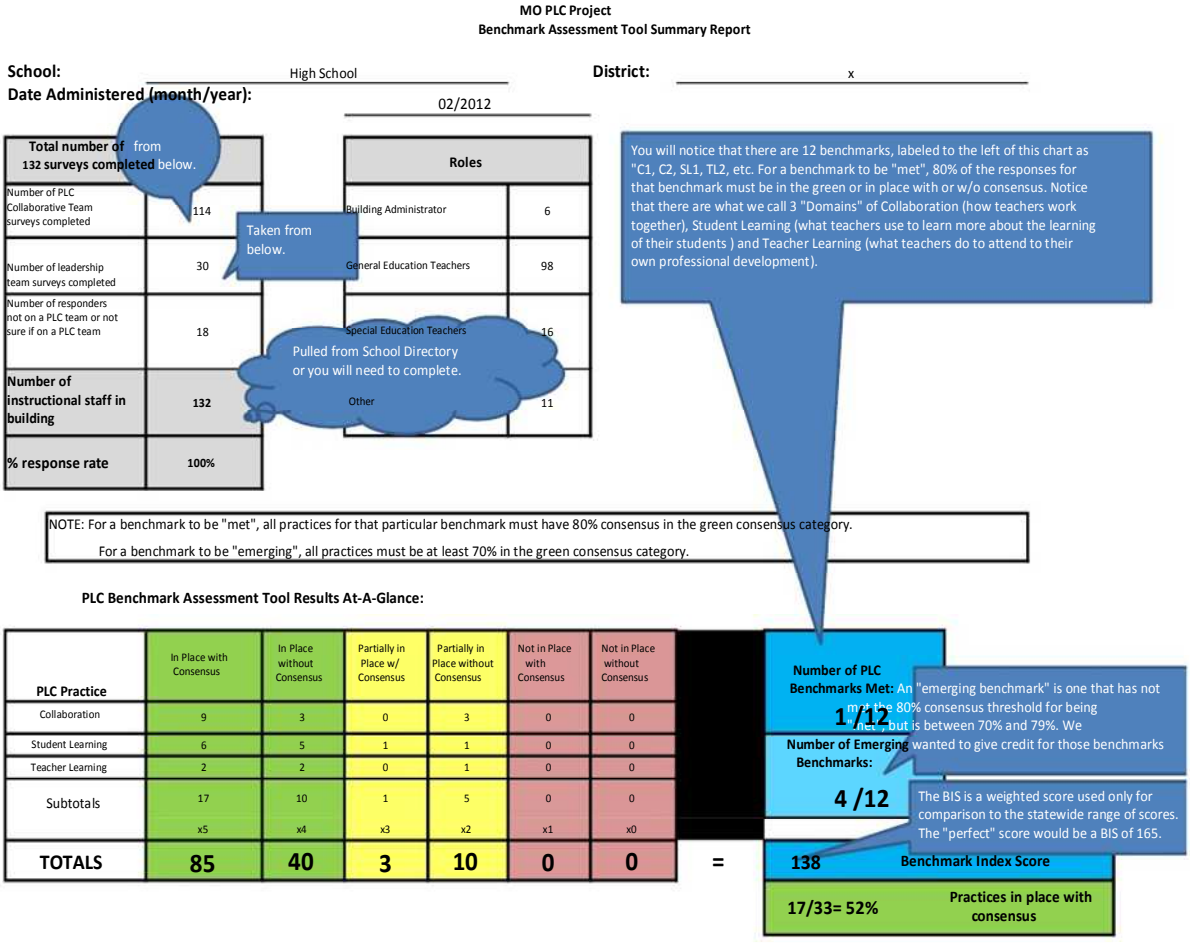
Additionally, it is evident that to provide for the implementation of more PLCs in Missouri schools, additional professional development and training should be offered throughout the state, at both the regional and state level. Although a significant difference was not found in the communication arts scores between the two groups, a significant difference was found in the math scores, and administrators perceived increased achievement was due to PLC implementation; therefore, strong consideration in favor of Missouri PLCs should occur. These efforts would bring about more professional development needs and opportunities for Missouri educators and administrators.

Utilizing the findings garnered through this research study alone, schools could see benefits with higher gains in student achievement by Missouri PLC program implementation. With additional information relative to implementation and further research, school districts in Missouri should take steps to implement the PLC process. With the implementation of any new program, due diligence is required to ensure that the program being implemented will bring about the desired results of the organization.

This research study identified areas in which Missouri educators should inquire when seeking change. PLCs could bring about results desired by districts when implemented correctly. Schools seeking a research-based school reform initiative to promote student success, higher student achievement, and continued professional development and growth for Missouri educators should not hesitate to gather information about PLCs.

# Appendix A

## Missouri PLC Benchmark Assessment Tool Sample



**MO PLC Project**
**Benchmark Assessment Tool Summary Report**

**School:** High School **District:** x

**Date Administered (month/year):** 02/2012

| Total number of 132 surveys completed (from below.) | |
|---|---|
| Number of PLC Collaborative Team surveys completed | 114 |
| Number of leadership team surveys completed | 30 |
| Number of responders not on a PLC team or not sure if on a PLC team | 18 |
| **Number of instructional staff in building** | **132** |
| **% response rate** | **100%** |

Taken from below.

| Roles | |
|---|---|
| Building Administrator | 6 |
| General Education Teachers | 98 |
| Special Education Teachers | 16 |
| Other | 11 |

Pulled from School Directory or you will need to complete.

You will notice that there are 12 benchmarks, labeled to the left of this chart as "C1, C2, SL1, TL2, etc. For a benchmark to be "met", 80% of the responses for that benchmark must be in the green or in place with or w/o consensus. Notice that there are what we call 3 "Domains" of Collaboration (how teachers work together), Student Learning (what teachers use to learn more about the learning of their students ) and Teacher Learning (what teachers do to attend to their own professional development).

NOTE: For a benchmark to be "met", all practices for that particular benchmark must have 80% consensus in the green consensus category.
For a benchmark to be "emerging", all practices must be at least 70% in the green consensus category.

**PLC Benchmark Assessment Tool Results At-A-Glance:**

| PLC Practice | In Place with Consensus | In Place without Consensus | Partially in Place w/ Consensus | Partially in Place without Consensus | Not in Place with Consensus | Not in Place without Consensus |
|---|---|---|---|---|---|---|
| Collaboration | 9 | 3 | 0 | 3 | 0 | 0 |
| Student Learning | 6 | 5 | 1 | 1 | 0 | 0 |
| Teacher Learning | 2 | 2 | 0 | 1 | 0 | 0 |
| Subtotals | 17 | 10 | 1 | 5 | 0 | 0 |
| | x5 | x4 | x3 | x2 | x1 | x0 |
| **TOTALS** | **85** | **40** | **3** | **10** | **0** | **0** |

=

**Number of PLC Benchmarks Met:** 1 /12

**Number of Emerging Benchmarks:** 4 /12

An "emerging benchmark" is one that has not met the 80% consensus threshold for being "met" but is between 70% and 79%. We wanted to give credit for those benchmarks

The BIS is a weighted score used only for comparison to the statewide range of scores. The "perfect" score would be a BIS of 165.

138 **Benchmark Index Score**

17/33= 52% **Practices in place with consensus**

# Appendix B

Missouri PLC Implementation Rubric

**Assessment Dates: Pre_____, Interim_____, Site Review_____**

**School Name_____, Region _**

| **Strand #1: Foundation for Learning Community Culture** | | | | |
|---|---|---|---|---|
| | **Deep Implementation** | **Proficient Implementation** | **Partial** | **Minimal or No** |
| **A. Mission** | The school community (staff, students, parents, patrons) demonstrate in words, actions and/or documents the school's mission. The school regularly revisits and aligns all relevant decisions to the mission. | Staff members are able to demonstrate knowledge of the school's mission statement that reflects a focus on learning and a belief all students can learn. Staff members can articulate how the mission guides decisions and actions in the school. | The school has developed a mission statement that reflects a focus on learning and a belief all students can learn. | Little or no evidence of implementation. |
| **B. Vision** | The school community regularly revisits the vision, including planning and documenting progress towards achieving the vision. | Staff members have collectively developed and demonstrate in words and actions a compelling vision for the future of the school. | The school has collectively clarified a compelling future for the school by developing a unifying vision. | Little or no evidence of implementation. |
| **C. Values / Commitments** | Collective commitments are annually revisited by staff. Assessment strategies are used to provide feedback on implementing collective commitments. | Staff members have developed and demonstrate in words and actions the values of the school through set of collective commitments. The school has aligned all decisions to collective commitments. | The school has identified and clarified values by developing a written set of collective commitments. | Little or no evidence of implementation. |
| **D. SMART Goals** | The school routinely and annually revises SMART goals, systematically sustained over time. | The school has established a common understanding of a results oriented learning community by creating, implementing, and monitoring building and collaborative team level SMART Goals and Action Plans that align with the mission, vision and commitments. The school uses a data team process to develop SMART goals | The school has established a common understanding of a results oriented learning community by creating and implementing building level SMART Goals and Action Plans that align with the expectations of the school. | Little or no evidence of implementation. |
| **E. School Culture** | The healthy culture extends to the community, as evidenced by academic, extracurricular and co-curricular involvement in activities. Assessment strategies are used to assess the culture. | The school has established a common purpose of learning for all, a collaborative culture, and a focus on results. | The school has created common knowledge of a PLC culture and analyzed the existing culture in order to facilitate change. | Little or no evidence of implementation. |
| **Notes/Evidence:** | | | | |

| Strand #2: How Effective Building-Level Leadership Teams Work | | | | |
|---|---|---|---|---|
| | **Deep Implementation** | **Proficient Implementation** | **Partial** | **Minimal** |
| **A. Shared Leadership** | All staff are leading and sharing all roles, and the school has created a long term plan for training and positioning staff for leadership roles. | The leadership team facilitates and employs practices of shared leadership with delineation of roles, processes and responsibilities (district leaders, principal leaders, teacher leaders). | The leadership team facilitates practices of shared leadership inconsistently and/or in a limited fashion. | Little or no evidence of implementation. |
| **B. Meeting Conditions** | The focus of regular meetings are proactive and responsive to specific building and student needs. | The leadership team meets regularly and effectively to provide direction for implementation. | The meeting conditions are inconsistent, or implemented in a limited fashion. | Little or no evidence of implementation. |
| **C. Communication** | The leadership team collects and analyzes feedback data to improve school practices, and are transparent in sharing their processes and decisions. | The leadership team effectively communicates using norms, roles, and protocols (i.e., agenda, minutes, decision-making tools, inquiry, processes, conflict resolution strategies). | The leadership team uses norms and protocols inconsistently and/or in a limited fashion. | Little or no evidence of implementation. |
| **D. Progress Monitoring** | The leadership team consistently monitors the progress of collaborative team/school goals, evaluates and provides feedback and organizes appropriate professional development. | The leadership team reviews and provides progress monitoring of collaborative team goals and school goals. | The leadership team reviews and progress monitors team /school goals inconsistently and/or in a limited fashion. | Little or no evidence of implementation. |
| **E. Feedback to Teams** | The leadership team has developed a systematic process for reviewing meeting records/artifacts, and provides descriptive feedback to collaborative teams. | The leadership team regularly reviews and acknowledges collaborative team meeting records and provides feedback to the teams to ensure fidelity of PLC implementation. | The leadership team reviews and acknowledges collaborative team meeting records and gives feedback to the teams to ensure fidelity of PLC implementation inconsistently and/or in a limited fashion. | Little or no evidence of implementation. |
| **F. Support** | The leadership team identifies the support needed for collaborative teams based upon regular feedback/review and progress monitoring. | The leadership team provides the necessary supports for effective collaboration and communication processes (i.e., time, high-quality professional development, team structures, etc.). | The leadership team inconsistently provides support for collaboration and communication processes (i.e., time, high-quality professional development, team structures, etc.), or does so in a limited fashion. | Little or no evidence of implementation. |
| **Notes/Evidence:** | | | | |

**Strand #3: Administrative Leadership (Duties, responsibilities, and expectations of an administrative leader in the PLC process)**

| | Deep Implementation | Proficient Implementation | Partial | Minimal or No |
|---|---|---|---|---|
| **A. Modeling** | The administrator consistently models the value of PLCs by: actively participating in all PLC trainings; networking with other building and district leaders; monitoring and participating in collaborative meetings; building differences and trust. | The administrator models values of Professional Learning Communities. | The administrator models the value of Professional Learning Communities inconsistently and/or in a limited fashion. | Little or no evidence of implementation |
| **B. Change** | The administrator proactively plans for effecting change by: actively assessing the cultural shifts associated with change, consciously planning for addressing conflict and/or problems before they actually occur. | The administrator leads the change process and addresses conflict when needed. | The administrator leads the change process but inconsistently and/or in a limited fashion. | Little or no evidence of implementation |
| **C. Communication** | The administrator effectively communicates to all stakeholders demonstrating sustainability and transparency. | The administrator communicates with stakeholders using appropriate communication methods. | The administrator communicates but inconsistently and/or in a limited fashion. | Little or no evidence of implementation |
| **D. Shared Leadership** | The administrator demonstrates deep implementation by establishing a systematic and sustainable process for sharing leadership, providing opportunities for leadership training to expand leadership capacity. | The administrator builds the capacity for shared leadership and practices by: actively participating in leadership team meetings, applying both loose/tight leadership styles, and providing resources, structures, and protected time for collaboration. | The administrator builds the capacity for shared leadership and practices inconsistently and/or in a limited fashion. | Little or no evidence of implementation |

**Notes/Evidence:**

| Strand #4: How Effective Teams Work | | | | |
|---|---|---|---|---|
| | **Deep Implementation** | **Proficient Implementation** | **Partial** | **Minimal or No** |
| **A. Meeting Conditions** | All teams meet regularly or more than 45 minutes per week and collaboration systematically includes both horizontal and vertical collaboration. | Most teams meet at least weekly during contract time for a minimum of 45 minutes with appropriate resources and tools (e.g. markers, displays, student data, instructional strategies, etc.). | The meeting conditions for teams are inconsistent, or implemented in a limited fashion. | Little or no evidence of implementation. |
| **B. Collaborative Meetings** | All teams are effective in using protocols for collaborative meetings, AND use a systematic recording and communication mechanism to maintain an accurate record of conversations and work done. | Most teams effectively use norms, roles and protocols (i.e., agendas, minutes, decision-making tools, inquiry processes, conflict resolution strategies, etc.). | Teams inconsistently use norms, roles and protocols (i.e., agendas, minutes, decision-making tools, inquiry processes, conflict resolution strategies, etc.), or do so in a limited fashion. | Little or no evidence of implementation. |
| **C. Corollary Questions** | The four corollary questions are regularly and systematically reflected in meeting agendas, conversations and dialogue. | All teams know and use the four corollary questions to guide their work. | Teams inconsistently know and/or use the four corollary questions to guide their work, or do so in a limited fashion. | Little or no evidence of implementation. |
| **D. Team Monitoring** | All teams regularly use a monitoring tool such as the Critical Issues for Team Consideration" to systemically monitor teaming practices, and *intentionally* submit to leadership teams for review and feedback. | Most teams use a monitoring tool such as the "Critical Issues for Team Consideration" to systematically monitor teaming practices. | Teams inconsistently use monitoring tools to guide the work of collaborative teams, or do so in a limited fashion. | Little or no evidence of implementation. |
| **E. Evidence** | All teams generate and collect accurate and appropriate evidence of their work, and a systemic process is in place for sharing evidence of student work publically in an appropriate | Most teams generate and collect accurate and appropriate evidence of their work. | Teams inconsistently generate and/or collect accurate evidence of their work, or do so in a limited fashion. | Little or no evidence of implementation. |
| **F. Focus on Results from Data** | All teams focus on results using strategies and structures to facilitate data-driven decisions by:<br>• Collecting/Charting Data<br>• Analyzing to Prioritize<br>• Setting SMART Goals<br>• Selecting Strategies | Most teams focus on results using strategies and structures to facilitate data-driven decisions by:<br>• Collecting/Charting Data<br>• Analyzing to Prioritize<br>• Setting SMART Goals<br>• Selecting Strategies | Teams inconsistently focus on results using strategies and structures to facilitate data-driven decisions, or do so in a limited fashion. | Little or no evidence of implementation. |
| **G. Trust / Participation** | Teams intentionally monitor and address shifts in trust and participation. | Staff members demonstrate high levels of trust and engaged participation in collaborative meetings. | Staff members inconsistently participate in collaborative meetings, or do so in a limited fashion. | Little or no evidence of implementation. |
| **Notes/Evidence:** | | | | |

| Strand #5: What Students Need to Know and Do | | | | |
|---|---|---|---|---|
| | **Deep Implementation** | **Proficient Implementation** | **Partial** | **Minimal or No** |
| **A. Essential Learning Terminology** | Teams communicate essential terminology to students who can demonstrate an understanding and use of the terminology. | Teams have identified and agreed upon essential learning terminology (standards, indicators, essential, nice to know, etc.) | Teams have neither consistently identified nor agreed upon essential learning terminology (standards, indicators, essential, nice to know, etc.), or have done so in a | Little or no evidence of implementation. |
| **B. Identified Standards** | All teams have adopted ELO's using appropriate criteria (endurance; leverage; readiness) or state recommendations. | Most teams have adopted ELO's using appropriate criteria (endurance; leverage; readiness) or state recommendations. | Teams have inconsistently identified essential learning outcomes utilizing common selection criterion, or have done so in a limited fashion. | Little or no evidence of implementation. |
| **C. Unwrapped Standards** | All teams have unwrapped and deconstructed essential learning outcomes including tasks such as:<br><br>identifying skills and content, aligning horizontally and vertically, written in student- friendly language, determining Depth of Knowledge, Identifying the Big Ideas and Essential Questions, Identifying prior learning. | Most teams have unwrapped and deconstructed essential learning outcomes including tasks such as:<br><br>• identifying skills and content<br>• aligning horizontally and vertically<br>• written in student-friendly language<br>• determining Depth of Knowledge<br>• Identifying the Big Ideas and Essential Questions<br>• Identifying prior learning. | Teams have inconsistently unwrapped and deconstructed essential learning outcomes, or have done so in a limited fashion. | Little or no evidence of implementation. |
| **D. Instructional Timeline (map)** | Teams regularly adjust instructional timelines based on data, and students are able to articulate to others their own learning progressions in each subject area. | Teams have implemented instructional timelines and identified instructional resources for instructing and assessing essential learning outcomes. | Teams have inconsistently developed instructional timelines and/or identified instructional resources for instructing and assessing essential learning outcomes, or have done so in a limited fashion. | Little or no evidence of implementation. |
| **E. Review & Revise Standards** | Systematic protocols are in place for teams to review, reflect and revise components of the ELO process. | Teams review, reflect and revise components of the ELO process. | Teams review, reflect and revise components of the ELO process in a limited way or extent. | Little or no evidence of partial implementation. |
| **Notes/Evidence:** | | | | |

| Strand #6: Assessment for/of Learning | | | | |
|---|---|---|---|---|
| | **Deep Implementation** | **Proficient Implementation** | **Partial** | **Minimal or No** |
| **A. Purpose and Type** | All teams understand the function and purpose of assessment and have developed the appropriate assessment tools (classroom formatives, common formatives, common | Most teams understand the function and purpose of assessment and have developed the appropriate assessment tools (classroom formatives, common formatives, common, summatives). | Teams have inconsistently identified the purpose and appropriate types of assessments, or have done so in a limited | Little or no evidence of implementation. |
| **B. Methods** | All teams have collaboratively determined appropriate assessment methods aligned to the standards:<br>• selected response<br>• extended written response<br>• performance assessment<br>• personal communication<br>• appropriate scoring guides | Most teams have collaboratively determined appropriate assessment methods aligned to the standards:<br>• selected response<br>• extended written response<br>• performance assessment<br>• personal communication<br>• appropriate scoring guides). | Teams have inconsistently determined appropriate assessment methods, or have done so in a limited fashion. | Little or no evidence of implementation. |
| **C. Feedback** | All teams have developed and applied strategies and techniques for providing timely specific descriptive feedback. | Most teams have developed and applied strategies and techniques for providing timely specific descriptive feedback. | Teams have inconsistently developed and applied strategies/techniques for providing descriptive feedback, or have done so in a limited fashion. | Little or no evidence of implementation. |
| **D. Student Involvement** | All teams have developed and applied strategies for involving students in the assessment process in a systematic manner. | Most teams have developed and applied strategies for involving students in the assessment process:<br>• Clear and understandable learning targets<br>• Student self-monitoring<br>• Student data notebooks<br>• Goal-setting | Teams have inconsistently developed and applied strategies for involving students in the assessment process, or have done so in a limited fashion. | Little or no evidence of implementation. |
| **E. Scoring** | All teams regularly and systematically utilize answer keys and/or scoring guides to collectively score student work. | Most teams utilize answer keys and/or scoring guides to collectively score student work. | Teams inconsistently utilize scoring guides to collectively score student work, or do so in a limited fashion. | Little or no evidence of implementation. |
| **F. Data** | Systematic and systemic protocols are utilized by teams to analyze student assessment (effect) data and adult behavior (cause) data with fidelity. Data is regularly used to audit assessments for validity and reliability. | Most teams analyze student assessment (effect) data and adult behavior (cause) data to inform instructional decisions and make adjustments. Data is also used to audit assessments for validity and reliability. | Teams inconsistently analyze student assessment data to inform instructional decisions and make adjustments, or do so in a limited fashion. | Little or no evidence of implementation. |
| **G. Grading Practices** | Systematic , school-wide decisions regarding research-based grading practices have been made and implemented with fidelity. | Most teams have examined current grading practices and the impact on student learning and have made collective decisions regarding appropriate grading practices. | Teams have inconsistently examined current grading practices and the impact on student learning, or have done so in a limited fashion. | Little or no evidence of implementation. |

| Strand #7: Systematic Process for Intervention/Student Success | | | | |
|---|---|---|---|---|
| | **Deep** | **Proficient Implementation** | **Partial** | **Minimal or No** |
| **A. Collective Responsibility** | Success for all students is deeply embedded in the school culture and is sustained over time, with adaptions and modifications for individual students. | Staff members accept and communicate responsibility for the success of all students. | Staff members inconsistently accept responsibility for the success of all students, or do so in a limited fashion. | Little or no evidence of implementation. |
| **B. Data** | There is a school-wide communication system for data, which is visible and accessible to all stakeholders, and involves other district buildings, both vertically and (when needed) horizontally. | Teams have a communication system for data (academic, behavior, attendance, entrance and exit criteria for tiers, etc.). | Teams have an inconsistent or limited communication system for data. | Little or no evidence of implementation. |
| **C. Tier 1** | Both cause and effect data are monitored and adjusted to increase fidelity of implementation across all aspects of Tier 1. Longitudinal data indicates tiered instruction is increasingly effective over time. | The school implements the essential components of Tier 1 intervention:<br>• universal screening 2 to 3 times per year<br>• continuous and ongoing progress monitoring<br>• evidence-based instructional strategies | The school inconsistently implements essential components of Tier 1 interventions (see proficient), or does so in a limited fashion. | Little or no evidence of implementation. |
| **D. Tier 2** | Both cause and effect data are monitored and adjusted to increase fidelity of implementation across all aspects of Tier 2. Longitudinal data indicates tiered instruction is increasingly effective over time. | The school implements the essential components of a Tier 2 intervention plan:<br>• identification of intentional non-learners and failed learners<br>• targeted, timely and directive instruction and assessment<br>• data-driven decisions based upon multiple sources<br>• more frequent progress monitoring. | The school inconsistently implements essential components of a Tier 2 intervention plan (see proficient), or does so in a limited fashion. | Little or no evidence of implementation. |
| **E. Tier 3** | Both cause and effect data are monitored and adjusted to increase fidelity of implementation across all aspects of Tier 3. Longitudinal data indicates tiered instruction is increasingly effective over time. | The school implements the essential components of a Tier 3 intervention plan:<br>• multiple sources of data to identify root causes of failed learning<br>• specific, more intensive support delivered by trained professionals<br>• targeted assessments for timely | The school inconsistently implements essential components of a Tier 3 intervention plan (see proficient), or does so in a limited fashion. | Little or no evidence of implementation. |
| **F. Protocols for** | Data from enrichment work is collected and monitored, and indicates increasing rigor and/or achievement over time. | The school implements systemic protocols and structures for students who have learned what is essential (Corollary Question #4), which includes a balance of enrichment and incentives. | The school inconsistently implements protocols for students who have learned what is essential, or does so in a limited | Little or no evidence of implementation. |
| **G. School-Wide Implementation** | A school-wide systematic process for intervention to support all learners has been developed and implemented across multiple academic areas and is monitored and adjusted over time. | A school-wide systematic process for intervention to support all learners has been developed and implemented. | The school has inconsistently developed or implemented school-wide interventions to support learners, or has done so in a limited fashion. | Little or no evidence of implementation. |

| Strand #8: Continuous Improvement | | | | |
|---|---|---|---|---|
| | **Deep Implementation** | **Proficient** | **Partial** | **Minimal or No** |
| **A. Induction** | The district implements systematic and organized training for all new staff in the foundations of PLC and collaborative teamwork. | Teams implement a structured induction process for new team members (all school personnel). | Teams inconsistently provide an induction process for new team members, or do so in a limited fashion. | Little or no evidence of implementation |
| **B. Action Research** | There is evidence of multiple cycles of action research which result in changes to practice and is shared with multiple stakeholders. | Teams engage in action research (e.g. Data Teams Cycle, PDSA Cycle) on an ongoing basis. | Teams inconsistently engage in action research, or do so in a limited fashion. | Little or no evidence of implementation |
| **C. Data Analysis** | There is a building-wide, systemic process for data analysis and utilization. | Teams disaggregate data, utilize it to change instruction, and share it effectively with multiple stakeholders, often through appropriate visual displays. | Teams inconsistently collect, analyze and monitor data for increased student achievement, or do so in a limited fashion. | Little or no evidence of implementation |
| **D. Celebration** | School wide systematic celebration of student and staff accomplishments is goal oriented and occurs throughout the school year. | Celebration of student and staff accomplishments is goal oriented and occurs throughout the school year. | Teams inconsistently celebrate growth and successes across all PLC components, or do so in a limited fashion. | Little or no evidence of implementation |
| **E. Fidelity** | The monitoring results from teams are utilized to adjust adult actions and structures, and are communicated openly. | Teams monitor the fidelity of implementation across all PLC components using an appropriate assessment instrument (i.e. Implementation Rubric, MO PLC Benchmark Assessment Tool, etc.) on an ongoing basis. | Teams inconsistently monitor fidelity across all PLC components, or do so in a limited fashion. | Little or no evidence of implementation |

**Notes/Evidence:**

# PLC Implementation Rubric Summary Sheet

**NOTES: Transfer the results of the Implementation Rubric to this summary sheet by checking the level of implementation for each indicator. The term "ALL" in the Implementation Rubric is applied to the indicators where involvement of teams must be 100% for proficiency. However, should an indicator be determined to be proficient with a few exceptions, identify the exceptions in the NOTES section below, and briefly describe why the exception is acceptable and/or what plans are in place to correct the exception. Throughout the IR, the phrase "inconsistently and/or in a limited fashion" is used. "Inconsistently" will be defined as implements sometimes and not others, irregularly. "In a limited fashion" will be defined as may be implemented regularly, but poorly, partially, or inappropriately. Both or either descriptors may be appropriate for a given situation**.

| Implementation Level | Deep | Proficient | Partial | Minimal |
|---|---|---|---|---|
| **Strand 1: Foundation for Learning Community Culture** | | | | |
| A. Mission | | | | |
| B. Vision | | | | |
| C. Values/Commitments | | | | |
| D. SMART Goals | | | | |
| E. School Culture | | | | |
| **Strand 2: How Effective Building-Level Leadership Teams Work** | | | | |
| A. Shared Leadership | | | | |
| B. Meeting Conditions | | | | |
| C. Communication | | | | |
| D. Progress Monitoring | | | | |
| E. Feedback to Teams | | | | |
| F. Support | | | | |
| **Strand 3: Administrative Leadership** | | | | |
| A. Modeling | | | | |
| B. Change | | | | |
| C. Communication | | | | |
| D. Shared Leadership | | | | |
| **Strand 4: How Effective Teams Work** | | | | |
| A. Meeting Conditions | | | | |
| B. Collaborative Meetings | | | | |
| C. Corollary Questions | | | | |
| D. Team Monitoring | | | | |
| E. Evidence | | | | |
| F. Focusing on Results From Data | | | | |
| G. Trust/Participation | | | | |

| | | | | |
|---|---|---|---|---|
| **Strand 5: What Students Need to Know and Do** | | | | |
| A. Essential Learning Terminology | | | | |
| B. Identified ELOs | | | | |
| C. Unwrapped ELOs | | | | |
| D. Instructional Timeline (map) | | | | |
| E. Review and Revise ELOs | | | | |
| **Strand 6: Assessment For/Of Learning** | | | | |
| A. Purpose and Type | | | | |
| B. Methods | | | | |
| C. Feedback | | | | |
| D. Student Involvement | | | | |
| E. Scoring | | | | |
| F. Data | | | | |
| G. Grading Practices | | | | |
| **Strand 7: Systematic Process for Intervention/Student Success** | | | | |
| A. Collective Responsibility | | | | |
| B. Data Communication | | | | |
| C. Tier 1 | | | | |
| D. Tier 2 | | | | |
| E. Tier 3 | | | | |
| F. Protocols for Enrichment | | | | |
| G. School-Wide Implementation | | | | |
| **Strand 8: Continuous Improvement** | | | | |
| A. Induction | | | | |
| B. Action Research | | | | |
| C. Data Analysis | | | | |
| D. Celebration | | | | |
| E. Fidelity | | | | |
| **TOTAL FOR ALL LEVELS** | | | | |
| **NOTES AND EXCEPTIONS:** | | | | |

# Appendix C

Interview Questions

1. Has the implementation of the Missouri PLC model in your school impacted student achievement?

   How?

2. What teaching practices have changed with the implementation of Missouri PLC implementation?

3. How have these practices impacted student achievement?

4. What is the teacher collaboration schedule for your building?

5. How are administrators involved in this collaboration time?

6. Has the allotment of teacher collaboration time impacted student achievement?

7. What areas are still ‘works in progress’ relative to Missouri PLC implementation?

8. What are some hurdles your building has overcome through the process of achieving Missouri PLC implementation?

## Appendix D

Recruitment Letter

Interview

Hello, this is Jori Phillips. I am contacting you regarding the research I am conducting as part of the doctoral requirement for Lindenwood University. My study is titled, *A Study of the Impact of Missouri Professional Learning Communities on Student Achievement,* and the purpose of the research is to examine if Missouri Professional Learning Communities have an impact on student achievement.

As the primary investigator, I am requesting your participation, in the form of a phone interview, to garner perceptions about Missouri Professional Learning Communities in your district. If you are interested in participating in the study, I will send you, via electronic mail, the informed consent form and list of interview questions. Then, we can establish the timeframe for the interview. Thank you for your time and support.

## Appendix E

LINDENWOOD

**INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES**
A Study of the Impact of Missouri Professional Learning Communities on Student Achievement

Principal Investigator _Jori K. Phillips_ Telephone: [redacted] E-mail: [redacted]
Participant _____ Contact info _____

1. You are invited to participate in a research study conducted by Jori K. Phillips under the guidance of Dr. Sherry DeVore. The purpose of this research is to identify if Missouri Professional Learning Communities have an impact on student achievement.

2. a) Your participation will involve
- Completing an interview in person, by phone, or via e-mail regarding the implementation of Missouri Professional Learning Communities in your school district.

- One interview will be sufficient for each participant.

b) The amount of time involved in your participation will be under thirty minutes. Approximately twelve schools will be involved in this research.

3. There are no anticipated risks associated with this research.

4. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about Missouri Professional Learning Communities and may help society.

5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study and the information collected will remain in the possession of the investigator in a safe location.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Jori Phillips @ [redacted], or the Supervising Faculty, Dr. Sherry DeVore @ 417-881-0009. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Jann Weitzel, Vice President for Academic Affairs at 636-949-4846.

**I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. I consent to my participation in the research described above.**

| | |
|---|---|
| _____ | _____ |
| Participant's Signature Date | Participant's Printed Name |
| _____ | ___Jori K. Phillips_____ |
| Signature of Principal Investigator Date | Investigator Printed Name |

# Appendix F

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

| | |
|---|---|
| DATE: | November 4, 2013 |
| TO: | Jori Phillips |
| FROM: | Lindenwood University Institutional Review Board |
| STUDY TITLE: | [516023-1] A Study of the Impact of Missouri Professional Learning Communities on Student Achievement |
| IRB REFERENCE #: | |
| SUBMISSION TYPE: | New Project |
| ACTION: | APPROVED |
| APPROVAL DATE: | November 4, 2013 |
| EXPIRATION DATE: | November 4, 2014 |
| REVIEW TYPE: | Expedited Review |

Thank you for your submission of New Project materials for this research project. Lindenwood University Institutional Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of November 4, 2014.

Please note that all research records must be retained for a minimum of three years.

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## Vita

Jori K. Phillips was born in Springfield, Missouri. She is passionate about education and currently serves as an Elementary Principal in a small, rural school. This research study was prompted by her involvement in the Professional Learning Community process in small school districts in both southwest and central Missouri.

Jori received her Bachelor of Science in Education in 2000 from Missouri Southern State University in Joplin, Missouri. She served many years as a 4th grade teacher before serving as a Title I Coordinator/Educator. She received her Master's Degree in Educational Administration from Lindenwood University in 2011. Shortly after attaining that degree, she accepted her first position as an Elementary Principal. She received her Specialist in Educational Administration from Lindenwood University in December of 2013.

Her future goals are to become a published author, writing books specific to the small, rural educational setting. She currently is working to implement Professional Learning Communities within the district she serves. Through this work, she hopes to continue to touch the lives of students in all aspects of the learning process.