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# The Relationship between the Implementation Phase of the DuFour Model of Professional Learning Communities and Students' Achievement

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# The Relationship between the Implementation Phase of the DuFour Model of Professional Learning Communities and Students' Achievement

by
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Abstract

The purpose of this study was to examine the relationship between the implementation phase of the DuFour model of professional learning communities (PLCs) and students' achievement. A survey was emailed via Qualtrics to elementary principals throughout the Minnesota Elementary Principals' Association's (MESPA) central, northern, northeast, west, southwest, and southeast divisions asking principals to self-report their school's implementation phase of the DuFour model of PLCs. Each principal's survey response was aligned with the school's students' achievement results as measured by the Minnesota Comprehensive Assessments (MCA). A Pearson *r* analysis was completed to determine if a relationship existed between the school's implementation of DuFour's model of PLCs and MCA variables. There was no significant ($p < .05$) relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement or third-grade MCA reading proficiency achievement in rural elementary schools. There was a significant ($p < .05$) and negative relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade science proficiency achievement in rural elementary schools.

Keywords: professional learning communities, DuFour model, students' achievement

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*"There comes a time in every man's life when he must take a chance and choose a wife. That time has finally come to be so will you take a chance and marry me?"*

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## Chapter One: Introduction

The achievement gap in Minnesota and throughout the United States is not improving at an acceptable rate (Martinez-Garcia, LaPrairie, & Slate, 2011). The 2019 proficiency levels in reading were only 35% for fourth-graders and 34% for eighth-graders, according to the National Assessment of Educational Progress (NAEP, 2019). Reading comprehension scores across the nation have remained essentially flat over the past decade (NAEP, 2019). Researchers emphasized the bleak statistics in early childhood by also noting that there is a substantial portion of adolescent readers who struggle with basic reading skills (Kim et al., 2016; Lee & Spratley, 2010; Vaughn et al., 2010). In addition, fourth-grade math scores have stagnated over the last 10 years with a score of 240 in 2009 and 241 in 2019 (NAEP, 2019). There have been perpetual reform efforts throughout history to improve students' achievement and reduce academic disparities between minorities and White students (Basch, 2011; Brown, Benkovitz, Muttillo, & Urban, 2011).

In 1965, President Lyndon Baines Johnson signed the Elementary and Secondary Education Act (ESEA) into law (U.S. Department of Education, 2017). The U.S. Department of Education stated that President Johnson's premise was to ensure a full educational opportunity for all students regardless of their demographics. ESEA provided districts that served low-income and special needs students with financial assistance in the form of grants. ESEA was the original deed that brought educational accountability to the forefront in the United States and future educational legislation has been a manifestation of this act. The accountability measure being utilized for comparison purposes was that of

worldwide students' achievement (U.S. National Commission on Excellence in Education, 1983).

Educational concerns in the United States grew with the publication of *A Nation at Risk: The Imperative for Educational Reform* in 1983 (U.S. National Commission on Excellence in Education, 1983). The authors asserted that schools throughout the United States were failing. The report highlighted various studies that supported students in the United States were underachieving on national and international scales. *A Nation at Risk: The Imperative for Educational Reform* ignited public school reform efforts via the distribution of federal funds earmarked to increase achievement.

In 2002, the ESEA was reauthorized with bipartisan support as No Child Left Behind (NCLB). This reauthorization was under the guidance of President George Walker Bush, who intended to eliminate the achievement gap among underserved groups of students. The NCLB legislation increased accountability in all districts that received federal funds by requiring the implementation of statewide assessments that measured students' achievement in a disaggregated format (Hayes, 2015). The disaggregation of data provided comparison measures of socioeconomic status, ethnicity, and disability (Ansell, 2011) and the legislation mandated that achievement results should be reported to the public.

On December 10, 2015 attempts at ESEA reauthorization came to fruition with the signing of the Every Student Succeeds Act (ESSA) (Coppes, 2016). This reauthorization continued to place a focus on educational achievement gaps in economic, demographic, and special education population subgroups. ESSA provided school administrators with more local control in making decisions aimed to close achievement gaps. Accountability measures

existed within this legislation to ensure the public was informed about improvement efforts in students' achievement throughout the United States (Rubin & University of Colorado at Boulder, 2017).

Minnesota adopted the World's Best Workforce (WBWF) legislation in 2012 which enacted further accountability reporting for school districts. The Minnesota Department of Education identified the five critical areas of this law (Minnesota Department of Education, 2021)

- Have all students meet school readiness goals
- Have all third-grade students achieve grade-level literacy
- Close the academic achievement gap among all groups
- Have all students graduate from high school
- Have all students attain college and career readiness

These components were required to be addressed in Minnesota school districts' strategic plans. The WBWF mandated school districts to post their progress on district websites and provide the Minnesota Department of Education with a summary of progress (Minnesota World's Best Workforce Law, 2012). This legislation extended the reins of accountability on school districts as it required additional public reporting to the school community beyond MCA proficiency data.

Alongside WBWF legislation, the state of Minnesota approved legislation that increased regulations regarding the evaluation of teachers. Historically, summative evaluations were required to be performed on continuing contract teachers once every three years, and teachers that were not of continuing contract status were to have three evaluations

completed each school year. Peer coaching was implemented in the new teacher evaluation law as a means to further develop pedagogy. In addition to these requirements, school districts throughout Minnesota were to implement and engage in professional learning communities (PLC) (Minnesota Legislature, 2020).

**Professional Learning Communities**

The World's Best Workforce legislation supported that PLCs can provide gains in students' achievement growth, findings that resulted in the exponential implementation of PLCs in districts (DuFour, 2004; Mullen & Schunk, 2010; Soares & Galisson, 2018). Although different iterations of PLCs are abundant, there are components to PLCs that must be present to be accurately categorized as PLCs (DuFour, 2007; Halmos et al., 2009; Levine, 2011; Webb et al., 2009; Williams, Brien, Sprague, & Sullivan, 2008). The term "PLC" can be defined by isolating each word: Professional refers to a group of educated instructors committed to the common purpose of a focus on students' learning. Learning means being engaged in the collaborative development of practice. A community is a group of professionals working interdependently towards a shared vision of high levels of student learning (DuFour & Eaker, 1998; Thompson, Gregg, & Niska, 2004). DuFour, DuFour, Eaker, and Many (2010) described PLCs as being:

> 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. (p. 11)

Within that definition, PLCs must align with the three big ideas: a focus on learning, a focus

on results, and focus on engaging a collaborative culture (DuFour et al., 2010). PLCs also include the following six characteristics: maintaining a shared mission, vision, values, and goals; constructing a collaborative culture; taking part in collective inquiry; being action-oriented; committing to continuous learning and improving; and being driven by results (DuFour et al., 2010).

Collaboration is a key component of PLCs (Cranston, 2009; Piercy, 2010; Strand & Emstad, 2020). In a traditional school setting, teachers work in isolation with minimal collaboration. The outstanding practices of the best teachers are rarely shared in a building engaged in isolationism, where teachers do not interact with their colleagues (Battersby & Verdi, 2015). A PLC shifts teachers' mindsets from isolationism to collaboration.
In a PLC, professionals work collectively to develop responses to student learning (Moulakdi & Bouchamma, 2020). The adults engage in collaborative conversations that enrich their professional practice and improve students' learning (DuFour, 2007; Thompson et al., 2004). Collaborative conversations are conversations in which professionals work interdependently to make progress toward meeting student needs. These collaborative conversations occur through the direction of building leaders and teacher leaders (Bezzina, 2006).

Collaboration through social networks or social capital has a positive relationship with students' achievement as measured by the summative students' achievement measure (CST-ELA) (Daly, Moolenaar, Martirosian, Canrinus, & Chrispeels, 2011). Collaboration is a vital component of PLCs: it is the substance that binds the work together (DuFour, 2007; Gray & Smyth, 2012; Kilbane, 2009; Nathan, 2008; Piercey, 2010).

## Statement of the Problem

The revisions in federal and state legislation since the original authorization of the ESEA have consistently included accountability of our nation's schools. These efforts intended to transform public schools and supported reforms of best practices in teaching, learning, and the disaggregation of assessment data. As initiatives come, go, and transform, it is a moral imperative for researchers to measure the effectiveness of specific practices so that the education field refines using data-informed decisions (Little, Cohen-Vogel, Sadler, & Merrill, 2019).

National and state education reform initiatives lead to institutional reforms, such as professional learning communities. Despite these reforms, national and state standardized assessments show discouraging growth in students' achievement. A concern is the rate of achievement on the Minnesota Comprehensive Assessments (MCA). From 2016 to 2019, third-graders have dropped in proficiency on both the reading and math MCAs. In 2016, third-graders were 58.0% proficient in reading and fell to 55.0% proficiency in 2019. The same decline was realized on the math assessment where third-graders achieved 70.0% proficiency in 2016 and fell to 66.0% proficiency in 2019. Lastly, science proficiency for fifth-graders fell from 61.6% proficient in 2016 to 54.9% proficient in 2019 (Minnesota Report Card: 2019 Minnesota Department of Education, 2021).

There was an increased accountability standard placed on schools throughout the United States as evident in passed legislation and bipartisan support of the reauthorization of the ESEA Education Act in 2002 titled No Child Left Behind (NCLB) (U.S. Department of Education, 2017). The NCLB Act called for every student in America to be proficient in

math, reading, and science as determined through statewide assessments (Klein, 2010). With the 2015 reauthorization of NCLB, titled the Every Student Succeeds Act (ESSA), legislators were pressed to hold our nation's achievement to a high standard that competed with a global society. In turn, the ESSA placed requirements on school districts in the United States to meet these high standards. The requirement of having all students achieve proficiency catapulted school districts to find innovative and best practices to improve students' achievement (U.S. Department of Education, 2021).

In 2012, Minnesota Statute 122A.41's requirement to implement PLCs was a response to the legislative requirement to increase the use of research-based instructional practices (MS 122A.41, 2020). School districts that had not implemented PLCs were required to have them in place by the 2014-2015 school year (MS 122A.41, 2020). Before 2014, schools were frequently unsuccessful in the full implementation of the PLC framework and sustaining PLCs (Hallam et al. 2015). Poor functioning components of physical, human, or social capital resulted in PLC implementation failure (Spillane et al., 2001). The lack of leadership, conflict resolution skills, time, practice, relationships, and knowledge were the key indicators in failed attempts to implement PLCs (Bezzina, 2006; Hallam et al., 2015). One contributor to failed PLC implementation efforts was a lack of teacher leaders (Bullough, 2007; Cranston, 2009; DuFour, 2007; DuFour & Marzano, 2011). School administrators often failed to include teachers in the identification of essential learning targets for sustained learning in PLC implementation. This failure caused a lack of motivation needed in the implementation process, which did not provide successful or sustainable implementation of the PLC framework.

A marked contrast has been identified in the ease of implementing the PLC framework in large districts compared to rural districts (Clarke, 2014). The marked contrast was attributed to the limited staff members that rural districts employed due to the small size of the student population (McConnell, Parker, Eberhardt, Koehler, & Lundeberg, 2012). Larger districts had multiple teachers in each content area, such as math, language arts, and science. Multiple teachers in the same content or grade level made it more conducive for collaboration (Nelson, 2008). In rural school settings, there was a need for creative collaboration as they addressed the challenges of limited staffing, resources, and time (Gray & Smyth, 2012; McConnell et al., 2012; Trust, 2012).

The lack of clear guidelines resulted in school districts implementing varying models of PLCs with varying levels of effectiveness (DuFour, 2007). School districts searched for an exemplar to build their own PLC framework (DuFour, DuFour, Eaker, Many, & Mattos, 2016) and the DuFour model of PLCs became the national prototype. The DuFour model of PLCs was research-based and national training were provided by Solution Tree, Inc. (Miller, 2020). Despite legislative mandates to implement PLCs and the common practice of adopting the DuFour model, there remains a need to determine if there is a relationship between phases of the DuFour model of professional learning communities and students' academic achievement (Levine, 2019).

**Purpose of the Study**

The purpose of this study was to determine if there was a relationship between the

implementation phase of the DuFour model of professional learning communities and third-grade reading and math MCA proficiency achievement as well as fifth-grade science MCA proficiency achievement in rural elementary schools.

This study examined the relationship of the implementation of the DuFour model of professional learning communities on students' achievement to aid leaders in making more informed decisions in the future. Rural school leaders make difficult decisions both in terms of financial management and the allocation of funds to programs aimed to support students' learning and achievement. Limited financial resources and limited ability to direct system-wide pedagogies require leaders to weigh decisions very carefully. The outcomes of this study may provide school leaders with an understanding of the relationship between the various implementation phases of the DuFour model of professional learning communities and students' achievement.

**Research Questions**

This study addressed the following questions:

1. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools?
2. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools?
3. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science

proficiency achievement in rural elementary schools?

**Hypotheses**

Null Hypothesis One: There is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools.

Alternative Hypothesis One: There is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools.

Null Hypothesis Two: There is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools.

Alternative Hypothesis Two: There is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools.

Null Hypothesis Three: There is no relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools.

Alternative Hypothesis Three: There is a relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools.

**Significance of Study**

Professional learning communities (PLCs) were implemented in United States public schools in the 1960s (American Educational Research Association, 2005; Nadelson et al., 2012). PLCs became more prevalent in the late 1990s as research on their effectiveness grew (Nadelson et al., 2012). The PLCs movement is in many United States schools (Cranston, 2009).

PLCs were discussed at Minnesota state legislative sessions and are now required by law (M.S. 122A.41, 2020). Legislative action was rooted in the belief that PLCs would lead to improvements in student academic achievement. Alongside the PLCS mandate were accountability measures from federal and state leaders placing pressure on school districts to raise the bar of students' achievement (Goldhaber, 2014).

Historically, it was common for educators to engage in professional development and never use what they learned in their own educational setting (Bezzina, 2006). Stand-alone professional development opportunities, such as a motivational speaker or specific workshops, are not effective forms of staff development (Desimone, 2011; McConnell et al., 2012). In a study on professional development for the novice teacher, Porter (2011) found that when professional development was integrated with “real-world” aspects of teaching, practice improved. It is clear that PLCs have emphasized continuous, job-embedded, professional development which is more effective than professional development that is not job-embedded (Mullen & Schunk, 2010; Thibodeau, 2008). As a result, school districts have sought expert training to gain insights regarding new efforts such as PLCs (Glickman,

Gordon, & Ross-Gordon, 2014) and numerous studies were conducted to identify the challenges of PLC implementation (Clark, 2014).

The fiscal and human resource commitment required to effectively implement PLCs is a substantial investment for rural school districts with limited resources (Buffum & Mattos, 2015). Though research has focused on effective implementation, little to no research has been conducted to determine if PLCs actually improved students' achievement in rural schools. Further research is needed to better understand how improved teaching practices, as a result of professional learning communities, influence students' achievement (Vescio, Ross, & Adams, 2008). This study aimed to provide insight for school administrators, specifically rural elementary principals, regarding the relationship between PLC implementation and student learning (Moulakdi & Bouchamma, 2020).

**Definition of Terms**

Accountability – The ability to consider information and take action to improve outcomes in achievement and instruction (Friedman, 2005).

Achievement – The ability to perform designated skills with proficiency (Beatty, 1975).

Elementary School – The Minnesota Legislature classifies elementary schools as any school with building, equipment, courses of study, class schedules, enrollment of pupils ordinarily in prekindergarten through grade 6 or any portion thereof, and staff meeting the standards established by the commissioner. For the purposes of this study, the elementary school must include at least third and fourth grades as they are the first grades included in state accountability testing each year (Minnesota Statute 120a.05, 2020).

Elementary and Secondary Education Act (ESEA) – Signed into law in 1965 by President Lyndon B. Johnson which represented a major commitment by the federal government to provide quality and equality in education (U.S. Department of Education, 2021).

Every Student Succeeds Act (ESSA) – 2015 reauthorization of the ESEA which engages equity, rigor, and innovations while maintaining accountability through mandatory standardized tests (U.S. Department of Education, 2021).

Minnesota Comprehensive Assessment (MCA) – A standardized assessment given to students. Reading and mathematics tests are administered in Grades three through eight. Students in Grade 10 take the reading assessment, and students in Grade 11 take the mathematics assessment. The science assessment is administered to students in grades five and eight and in a high school grade when students take a life science and or biology course (Minnesota Department of Education, 2020).

No Child Left Behind (NCLB) – 2001 reauthorization of the ESEA to expose achievement gaps and engage conversation on how to close them through accountability efforts using mandated standardized testing (U.S. Department of Education, 2021).

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 (DuFour et al., 2010).

Proficient – Students that meet or exceed the standards on the Minnesota Comprehensive Assessment (Minnesota Department of Education, 2020).

Rural – Locations outside census places with a population of less than or equal to 50,000 people and outside the seven-county metropolitan area (Minnesota Department of Agriculture, 2021).

**Organization of the Remainder of the Study**

A review of literature is provided in Chapter Two to establish foundational background knowledge for the study. Chapter Three specifically highlights the methodology to be applied to the research. Chapter Four includes the results of the study. In closing, Chapter Five, provides an overview of the study, conclusions, implications, recommendations for practitioners, recommendations for academics, and concluding comments.

## Chapter Two: Review of Literature

In the 2012 legislative session, Minnesota lawmakers brought professional learning communities to the forefront of education discussions (M.S. 122A.41). As a result, Minnesota State Statute 122A.41 mandated school districts implement PLCs by the 2014-2015 school year. PLCs have been used as a political tool in the development of educational reform. The research identified the importance of fidelity in the implementation of the DuFour model of PLCs which includes the three big ideas and four guiding questions (DuFour et al., 2010; Levine, 2019).

### Professional Learning Communities

The groundswell of PLCs took place in the 1960s and focused mainly on improving teachers' practice (American Educational Research Association, 2005; Nadelson et al., 2012). PLCs became a phenomenon in K-12 education and were being leveraged to improve teacher effectiveness in which the byproduct became improved students' achievement Nadelson et al., 2012). In the early 1990s, the phrase "PLCs" spread throughout school improvement initiatives in the United States and began to focus on high levels of student learning in addition to teacher practice (Nadelson et al., 2012).

Definitions of PLCs are abundant. DuFour et al. (2010), pioneers of the PLC framework, expressed concern about the loose utilization of defining PLCs, noting that: "In fact, the term has become so commonplace and has been used so ambiguously to describe virtually any loose coupling of individuals who share a common interest in education that it is in danger of losing all meaning" (p. 10).

PLCs have been defined in different terms over the years (Bianchini, Southerland, & Windschitl, 2010; DuFour, 2007). One form of PLCs was described as a group in which all people believe students can learn at high levels, work collaboratively, understand results, and respond (DuFour & Marzano, 2011). Another definition of PLCs had five components: shared vision, collective commitments, collaboration, inquiry, and adult and student learning (Thompson, Hagenah, McDonald, & Barchenger, 2019). Student learning and collaboration were consistent in the definitions. The disparities in the definitions made it important for school leaders responsible for implementation to clearly identify the vision of the PLCs to all district stakeholders (Williams et al., 2008).

A prominent PLC model adopted by school districts was the DuFour model of PLCs. DuFour and Eaker (1998) provided clear criteria and guidelines for effective PLCs: Three Big Ideas and the Four Guiding Questions. The Three Big Ideas are the following:

- A focus on learning
- A focus on results
- A focus on collaboration

The Four Guiding Questions are as follows:

- What is it that all students must learn?
- How will educators know students have learned it?
- What will educators do if students have not learned it?
- What will educators do if students have learned it?

Big idea number one includes the distinct shift from a focus on teaching to a focus on learning (DuFour et al., 2016). In the DuFour model of PLCs, the question teachers asked

transitioned from, “Was the content taught?” to “Was the content learned?” (Academy of Singapore Teachers, 2021). School leaders and teachers worked interdependently to ensure all students learn at high levels (DuFour & Eaker, 1998; Thompson et al., 2004).

Big idea number two, a focus on results, highlighted an extreme focus on student assessment results during PLC meetings. It necessitated the utilization of frequent common formative assessments (DuFour et al., 2016). Such a focus identified students’ stages of learning (Woodland, 2016).

Big idea number three, a focus on collaboration, supported that when a focus on learning and results were present in collaborative conversations during PLC meetings, students' achievement increased (DuFour et al., 2016). When teachers work together, they develop a shared purpose and welcome a culture of collegiality and community (Doolittle, Sudeck, & Rattigan, 2008).

**Five Key Components of Professional Learning Communities**

Stoll, Bolam, McMahon, Wallace, and Thomas (2006) highlighted five components of effective implementation of PLCs, which include collaboration, group learning, reflective inquiry, collective responsibility, and shared values and vision. Each of these facets is integral to the effectiveness of professional practice and student outcomes (Stoll et al., 2006). Though the facets are labeled and defined separately, the practice of the facets within a school is interwoven and integrated.

**Collaboration**

When collaboration occurs, it ensures a presence of shared identity, connectedness, trust, belonging, and mutual dependence (Scribner, Sunday Cockrell, Cockrell, & Valentine,

1999). Nelson (2008) found that the ability to collaborate can be different from one building to the next within the same district. Nelson found that one school discovered the benefits of collaboration while the other two schools had a difficult time buying into collaborative working relationships. The school building that was successful in collaborative efforts had clear collective commitments with a focus on inquiry development. The other two schools did not display the ability to come to a consensus (Nelson, 2008).

When effective collaboration occurs, a positive culture can emerge (Henderson, 2018). In such an environment, collaborative conversations take place that are filled with pedagogical knowledge to vastly improve instruction and pedagogical awareness (Melesse & Gulie, 2019). Teachers in a collaborative environment need to be receptive to the idea that others may have a better way of applying instruction (Sheridan, 2016). Accepting that others may have a better way of "doing" will allow for a transformation from isolation to effective collaboration (Servage, 2008). Bianchini et al. (2012) discovered that teachers identify and value collaboration as a critical component to their development as teachers. In this study, it was discovered that teachers felt as though they developed more from their PLC peers as opposed to their non-PLC peers (Bianchini et al., 2012).

The ability and time to collaborate are essential in building the collegiality of teachers and such collegiality is an important characteristic of improving teachers' professional growth (Richmond & Manokore, 2010). If teachers are not provided the time to collaborate, they are less likely to experience high levels of professional improvement. Richmond & Manokore (2010) discovered that participants gained a better understanding of their professional practice when they worked with subject alike and grade alike peers to discuss

pedagogy and instruction. Strong leadership is required when teachers shift from working in isolation to collaboration (Battersby & Verdi, 2015). Schools that experience this shift in practice rely on teachers who are highly skilled in change practices (Doolittle et al., 2008). These teachers understand the stages of the change process and can guide the work more effectively to ensure the result is a success (Doolittle et al., 2008).

Effective staff engagement occurs when collaborative groups meet on a regular basis in one-hour increments (DuFour, 2013). A determined time period is essential in ensuring these discussions take place to discuss the redesign and alignment of the curriculum (Reitz, 2018). Teachers determine what is necessary to be learned and in what chronological order. When these collaborative conversations take place, they begin with the end result desired and plan backward to ensure all learning outcomes are discussed, planned, and implemented (Christ, Arya, & Chiu, 2017).

Collaborative conversations that focus on comprehension, transformation, instruction, evaluation, and reflection are common practices in the work of PLCs (Fisher, Frey, & Almarode, 2019; Shulman, 1987). Districts that engage in these practices are often motivated to do so by legislative pressures from local, state, and federal governments (Bianchini et al., 2010). Occasionally these practices are implemented due to internal motivations created by below-average assessment outcomes (Bianchini et al., 2010).

**Group Learning**

Group learning has a tremendous impact on the development of staff members (Klein, 2007). Teachers have the ability to learn on an individual level, but they are more likely to develop efficiently and effectively with the company of colleagues (Stoll et al., 2006). In

times where staff members are provided with a task to solve and the expectation to engage the minds of others, it provides effective interpretations and swift action (Stoll et al., 2006).

When teachers assess students, gather data, and review data in groups, patterns are sure to emerge as more expertise lends itself to better chances of discovery (Louis, Kruse, & Bryk, 1995). Effective, research-based responses to gaps in learning are more likely to be developed and delivered (Louis et al., 1995). This important work within a group of teachers provides students with impactful learning opportunities and growth (Gleason et al., 2019).

Teachers in buildings who have adopted the common practices of PLCs, begin to diligently question their practices and share outcomes with others. These teachers begin to find common ground in aligning their learning objectives and assessment techniques. Through this collaboration, these teachers are able to mold lessons of effectiveness and engage high levels of student learning through collective reflection (Zimmerman & Sommers, 2020).

In a study of the effectiveness of virtual versus in-person group learning, McConnell et al. (2012) found that the experiences were equally effective when including the sharing of learned material, giving new perspectives, hearing practical solutions, providing accountability to the group, focusing on the professional discourse, and developing professional relationships. The first three focused clearly on group learning while the remaining three focused more on procedural components of professional learning communities (Burke et al., 2010; McCullough et al., 2012).

Structuring the work being completed by teachers in a PLC is essential in keeping the work progressing. In the PLC, each educator plays a specific role so that conversations are

productive (Hoffman, Dahlman, & Zierdt, 2009). Each role contributes to the structure of the PLC and the work to be completed. These roles may include a timekeeper, agenda builder, task manager, and norm enforcer (DuFour et al., 2010). The development of a PLC district-wide leadership team creates a simultaneous loose-tight relationship in which district stakeholders feel directly involved in the decision-making process and provides the accountability necessary for implementation (DuFour et al., 2010). These team members also define what is nonnegotiable about the PLC process, such as, the establishment of roles and responsibilities (DuFour et al., 2010).

**Reflective Inquiry**

Being a reflective practitioner and engaging in reflective dialogue with subject alike and grade alike peers are practices that have been proven to be effective over the course of time (Stoll et al., 2006). Williams et al. (2006) found that the ability for staff members to collaborate in reflective inquiry was a key component to the development of teacher effectiveness. When reflective inquiry takes place, it is important for teachers to pose problems to draw on the experiences of others to determine learning or instructional gaps in realized outcomes (Wood, 2007). The ability to engage in reflective inquiry is critical to high-functioning PLCs (Stoll et al., 2006).

Teachers engage in professional development to inform their instruction and improve their skill set (Nadelson et al., 2012). Engagement in discussion amongst instructors has a positive impact on students' achievement and staff pedagogy, and it is critical for staff to engage in ongoing, job-embedded professional development (Bullough, 2007).

## Collective Responsibility

The history of teacher practice has been to work in isolation, within the confines of their own classrooms (Ball, 2014). This theme of isolation has come to the forefront as a need to change in order to improve education (Tyack & Hill, 1995). Application of the PLC framework requires that school districts embrace a cultural shift to collective practice (Martin, 2020). PLC work is dependent on a culture that embraces collective responsibility which includes teachers, paraprofessionals, custodians, clerical staff, administrators, and other stakeholders (Vanblaere & Devos, 2016). Cohen and Hill (2000) found that students' level of math proficiency was greater in schools where teachers worked collectively in a collaborative conversation where each party was dependent on one another to ensure the collective success of PLCs. In a PLC, there are various responsibilities such as norm enforcer, time manager, and note taker and one individual cannot and should not be responsible for all those jobs (Vanblaere & Devos, 2016).

A commitment to collective responsibility allows teachers to maintain a focus on improving learning for students (Hargreaves, 2007). Teachers work collaboratively to ensure all students learn (Louis & Wahlstrom, 2011). By engaging in collective responsibility, teachers work to improve student learning and responses to gaps in learning. This commitment provides an opportunity for teachers to experience the benefits of collective responsibility and motivates them to avoid isolationism (Vanblaere & Devos, 2016). Teachers in PLCs also work collectively to ensure their own professional practice is improved systemically. By working collectively, teachers improve instructional and pedagogical practice (DuFour & Mattos, 2013).

## Shared Values and Vision

PLCs endorse the development of shared values and vision with the primary purpose being an unwavering commitment to enhanced students' achievement (Hord, 2004). A shared vision ensures a positive outcome is reached throughout a change process (Doolittle et al., 2008). When a change is in process, there are several barriers that can be predicted and others that will be discovered. With a shared vision, those barriers can be overcome (Doolittle et al., 2008).

The development of a mutually agreed-upon vision with the input from all stakeholders is an effective practice in creating staff buy-in (Doolittle et al., 2008; Huffman, 2003). Young, Millard, and Kneale (2013) found that the foundation of PLCs was strengthened when a shared vision and mission committed to high levels of students' achievement were created. When there is a shared purpose in collaborative work being done, effective progress can be made to develop professional practice (Peskin, Katz, & Lazare, 2009). Collaboration in the development of shared values and vision, when done well, improves practice, culture, and pedagogy (Özdemir, 2019).

## Professional Development Required to Implement and Sustain PLCs

Professional development, in the historical context, has typically consisted of a single event that emphasized professional practice or philosophical concepts associated with educational trends (McConnell et al., 2013). The issue with a single event is that it does not always carry over to classroom practice (Bowe & Gore, 2017). Becoming a master teacher requires teachers to engage in ongoing, job-embedded professional development (Nadelson et al., 2012).

This job-embedded philosophy is highlighted in the work completed by Bausmith and Barry (2011). In their work, they emphasized three key components of job-embedded professional development which included an ongoing focus on training over an extended period of time, a focus on content and how students master it, and opportunities for teachers to work collaboratively on student learning.

The work of Desimore (2011) expanded on these components of effective professional development by highlighting the following characteristics:

- Content-focused – a focus on content and how students learn that content
- Active learning – professional development should be job-embedded through the use of feedback as skills are applied
- Coherence – development should be scaffolded which builds on prior learning
- Duration – learning should be done over time and be ongoing
- Collective participation – professional development should be done together with professionals so that maximum learning can take place

The expansion of PLCs has promoted the professional development of classroom teachers as being a job-embedded process (Bausmith & Barry, 2011). During PLC work, teachers participate in discussions related to teacher practice and students' achievement (Feldman, 2020). Teachers engage in professional development to inform their instruction and improve their skill set (Nadelson et al., 2012). This process is most effective when teachers apply their learning to their instructional methods. Items uncovered within collaborative conversations have a direct impact on teacher outcomes. These discoveries lead to higher levels of students' achievement (Riveros, Newton, & Burgess, 2012).

Teachers engage in professional development to inform their instruction and improve their skill set (Nadelson et al., 2012). Engagement in collaborative work and discussion amongst instructors has a positive impact on students' achievement and staff pedagogy and it is critical for staff to engage in ongoing, job-embedded professional development (Dennis & Hemmings, 2019).

Professional development must be administered with professional or procedural controls to ensure there is fidelity in the implementation of defined teacher practices and the professional learning community framework (Burke, Marx, & Berry, 2010). Professional controls would include guides for curriculum and well as specific definitions of accepted pedagogy (Burke et al., 2010). Procedural controls would include instructional routines and professional learning community practices (Burke et al., 2010). When professional development is provided with both professional and procedural controls, successful implementation of change efforts comes to fruition (Burke et al., 2010). Bullough (2007) found that reform efforts fail when teacher capacity is not enhanced and built upon. In order to build teacher capacity to function effectively in the classroom and within professional learning communities, teachers must be educated (Bullough, 2007). Teacher education must be filled with the training of different instructional techniques and collaboration strategies but it also must allow for problem-solving and discovery through professional learning communities (Bullough, 2007).

Quality teaching equals quality learning (Wood, 2007). There is great debate about the quality of instruction children receive (Padwad & Dixit, 2008). Schools throughout the world are assessing teacher effectiveness through evaluation efforts. The evaluation should

drive the professional development that each teacher receives (Webb, Vulliamy, Sarja, Hamalainen, & Poiknonen, 2009). Professional development is the vehicle for improved professional practice and teaching (Melesse & Gulie, 2019). The PLC process increases the aptitude for learning for students and teachers. This approach complements a shift from teaching to learning (Pella, 2011).

**Leaders' Role in Implementing and Sustaining PLCs**

There are three important leadership styles that are present and applied in schools with successful PLCs: instructional, transformational, and transactional (Mullen & Schunk, 2010). Instructional leadership focused on ensuring that best practices in classroom pedagogy aligned with building goals, PLC goals, curriculum, and school culture (Mullen & Schunk, 2010). Transformational leadership focused on the need for change based on policy, data, or other system requirements (Mullen & Schunk, 2010). Transformational leaders effectively led teachers through the change process-in the successful implementation of professional learning communities (Mullen & Schunk, 2010). Transactional leadership assisted in transitioning to professional learning communities by setting goals and aligning those goals to action (Mullen & Schunk, 2010).

Individuals in leadership positions within the context of implementing PLCs must be equipped with the skills to question practice, engage in reflection, and instill a focus on professional learning and student success (Gilbert, 2018). These leadership attributes provide a focus for the collaborative discussions that take place in a PLC (Horn & Little, 2009). In situations where leadership is not present, PLC teams experience a disconnect in desired outcomes (Horn & Little, 2009).

Stole and Louis (2007) found that the implementation of a PLC is an arduous task. The process requires commitment, perseverance, vision, and hard work. Shared leadership was found to be an effective model in PLC implementation. The approach involved teachers and other faculty members in the decision-making process while allowing for context to be a factor in determining what is best for the school and its students (Sigurdardottir, 2010).

A specific barrier to PLC implementation that requires a school leader to technically navigate is scheduling (Buffum & Mattos, 2015). Educators working in a PLC must be provided with the necessary time to participate in related activities (Reitz, 2018). Time allocation for PLC groups combined with professional development provides teachers with the opportunity to further develop their capacity as instructors (Bezzina, 2006). Providing educators with time to participate in PLCs ensures high levels of staff engagement and results in productivity (Trust, 2012).

Collaboration is the key component to high-functioning PLCs. Engaged conversations between adults in the educational profession further develop the capacity of each individual. Teachers shift from working in isolation to working collaboratively (Bullough, 2007; Thompson et al., 2004). In order for teachers to engage in this process, they need to feel as though they are supported in the endeavor and that their voices are heard (Goble, 2012). School administrators impact levels of trust by modeling a collaborative culture and investing in the adaptive work on changing beliefs in norms (Buffum & Mattos, 2015).

School districts that develop professional learning communities are guided by principal leadership (Cranston, 2009). Principals are responsible for ensuring organizational

goals and objectives are met through system alignment and teacher evaluation (Cranston, 2009). It is critical that principal leadership is strong in the development of the teacher and the professional learning community (Cranston, 2009).

When a teacher-led process is at the center of professional learning community work there can be a risk of failed implementation (Levine, 2011). When large-scale change is being implemented teachers may not push themselves through to full implementation due to a variety of factors, such as workload, lack of knowledge, and comfort level of teacher scrutiny (Levine, 2011). Principals are trained and hired to engage in organizational improvement and can provide the strong leadership needed to implement professional learning communities (Levine, 2011).

**Challenges in the Implementation and Sustainability of PLCs**

With any change initiative, there are challenges. The established norm of teacher practice is to work in isolation due to the daily demands of the job and the history of teacher training (Duffield, 2005). When asking teachers to shift from isolation to collaboration, there is a need for structural support (Beddoes, Sazama, Prusak, Starck, & McMullen, 2020). In the conventional schedule, collaboration is not accounted for nor is it suitable. This shift requires a redefinition of traditional scheduling to provide collaborative work time for teachers (Horn & Little, 2009).

Traditional teacher training and experience lack clarity regarding the components of collaboration and the development of those skill sets and dispositions (Wilson & Wilson, 2019). In general, teachers are not privy to the characteristics of collaboration (Wilson & Wilson, 2019). Historically teachers have collaboratively planned field trips and other

endeavors but have not engaged in a discussion of how to improve student learning or teacher practice (Wilson & Wilson, 2019). This inexperience is a barrier to shifting from isolation to collaboration (Doolittle et al., 2008).

Sufficient funding can also hinder the PLC change initiative. Funds are needed to provide training, curriculum, time, and other essentials to ensure professional learning communities are implemented with efficacy. As school districts begin the planning of this change in practice, they often overlook the fiduciary responsibility (Doolittle et al., 2008).

Data collection and interpretation of data are the foundation for successful implementation (Brown, Horn, & King, 2018). In situations where PLCs have not been successful, the knowledge and experience with data collection and interpretation have been absent (Schildkamp, 2019). In order to identify gaps in instruction or student learning, teachers need to have an understanding of what to look for and how to interpret results (Schildkamp, 2019).

External obstacles interfere with the implementation of PLCs. Although state and federal mandates may require PLCs, other mandates prove to be a hindrance for implementation. For example, there are expected outcomes for students' achievement and the rigorous standards can be in conflict with implementation due to the amount of time it takes to teach required content (Woolard, 2013). The time needed for content delivery can deter setting aside time to meet in collaborative teams to engage in the work of PLCs (Reitz, 2018). As a result of these external obstacles, teachers must “teach with a sense of urgency” making every moment count while students progress through the standards (Routman, 2002).

Historically, the educational practice has been to focus on adults involved in the system (Foster, West, & Bell-Angus, 2016). In contrast, successful districts place focus on high levels of student learning (DuFour, 2007). Increased students' achievement is realized when an effective and clearly defined PLC is implemented (Cranston, 2009). A shift from a focus on teaching to a focus on learning creates positive and negative ripples in the PLC implementation process (Foster et al., 2016). For many professionals, this change in mindset can be difficult to overcome and can negatively impact the PLC process (NAESP, 2008). The shift to a collaborative focus on the learning needs to be taught to those participating in the PLC transformation (Riveros et al., 2012).

Relationships among stakeholders play a vital role in implementation efforts (Gaias et al., 2020). A lack of trust between teachers, teacher leaders, administration, board members, and parents halt the progress of implementation. When time is set aside for collaboration, some people do not trust that time as being a valuable asset to student learning (Reitz, 2018). The PLC framework requires dialogue in collaboration amongst teachers. When teachers have not engaged with subject alike or grade alike teachers, there is insufficient progress in professional development and teacher practice (Horn & Little, 2009). This proves to be a challenge in rural districts when there may only be one Spanish teacher or one industrial technology teacher. In these situations, rural districts find themselves challenged in finding a PLC that meets the needs of their educators, which ensures collaborative dialogue.

When a collective capacity is absent in a school, there is an assurance that successful PLCs will not be experienced. There needs to be a clear understanding of the expectations of all PLC teams. Teachers in PLCs need to have a direct understanding of what protocol exists

for conversation planning and how to handle conflict. If a specific expectation is not present, PLC teams will struggle with positive progress (Horn & Little, 2009).

When PLCs are adopted, the existence of common support must be present. If a single staff member or group attempts to implement the PLC framework the initiative will not take flight. Implementing the PLC program necessitates a collaborative group effort. Due to the complexity and amount of time PLCs take to implement, stakeholder ownership is vital in order to accomplish this institutional change (Horn & Little, 2009).

The structure of PLCs and the understanding that the structure consistently develops is important in unfolding the concept of professional learning communities (Cranston, 2009). PLCs are developed throughout time by using collaborative efforts from all staff involved (Riveros et al., 2012). Utilizing a collaborative approach by fostering feedback positively renovates the PLC process in their development (Preast & Burns, 2019). The PLC framework is a continuous cycle that is molded to fit the needs of each school district, yet they must be aligned to the three big ideas and four guiding questions (National Association of Secondary School Principals, 2013).

Sufficient capacity to initiate, implement, or sustain change initiatives stems from an understanding and familiarity with educational change models (Doolittle et al., 2008). Without an understanding of effective change processes and procedures and the ability to put them into practice proved to be a real challenge for school districts implementing the PLC framework (Doolittle et al., 2008). In relation to this Cranston, (2009) found that when working through the change process in the implementation of PLCs, those organizations that expected the implementation to have an ending point, often lacked success. Those

organizations that accepted the fact that the PLC implementation was a continuous process found success in implementation and sustainability (Cranston, 2009).

**Summary**

PLCs have been prescribed by lawmakers in the State of Minnesota as part of the Teacher Development and Evaluation Law enacted in 2012 (Minnesota Teacher Development and Evaluation Law, 2012). Over the past 50 years, PLCs have evolved into the nationally recognized DuFour model, which focuses on the "three big ideas" and "guiding questions" (Nadelson, Croft, Ennis, Harm, McClay, & Winslow, 2012).

Providing an appropriate amount of time to engage in collaborative conversations allows teachers the opportunity to collectively reflect on professional practice and students' achievement. In a PLC, teachers shift a focus from teaching to learning (DuFour, 2007). Teachers develop a laser-like focus on student learning in order to inform instruction and pedagogical practice (DuFour, 2007; Riveros et al., 2012).

Schools that have engaged in the PLC practice have realized improved practice and student learning (Kilbane, 2009). Collaborative work has been embraced by educators and has promoted a cultural shift in the way they conduct business (Kilbane, 2009). Through this process, there is a collective commitment to providing students with more learning opportunities to ensure achievement levels are increased and sustained (Kilbane, 2009).

In a PLC, teachers view their time together as an opportunity to inform practice, adjust course, and impact student learning (Bullough, 2007). Teachers view the meeting times as a place to dissect student learning and make adjustments in an approach to inform

instruction and provide responses to gaps in learning or instruction (Cranston, 2009). This cultural shift to reflective practice builds on pedagogy and learning (Burke et al., 2010).

Moving from isolation to a collaborative setting is a transformation that requires diligence and perseverance (Servage, 2008). Staff members moving from the comfort of their own classrooms to sharing openly with colleagues requires a culture of trust (Reynolds, 2016). Teachers working in a collective environment need to build this trust through the continuous exchange of dialogue in collaboration (Reynolds, 2016).

There are challenges in the implementation of PLCs as teachers are asked to shift from working in isolation to working collaboratively and in this transition, there must be structural support provided (Chen, Lee, Lin, & Zhang, 2016). Although there are challenges in any transition or change initiative, inexperience must be met with support (Doolittle et al., 2008).

# Chapter Three: Methodology

## Introduction

The purpose of this study was to determine if there was a relationship between implementation phases of the DuFour model of professional learning communities and student academic achievement. The achievement was measured by the percentage of third-grade students proficient on the Reading Minnesota Comprehensive Assessment (MCA), third-grade students proficient on the Math Minnesota Comprehensive Assessment (MCA), and fifth-grade students proficient on the Science Minnesota Comprehensive Assessment (MCA).

This study examined the relationship between implementation phases of the DuFour model of professional learning communities and students' achievement to aid leaders in making informed decisions in the future. Rural school leaders make difficult decisions in terms of the allocation of human resources and funds to programs aimed to support students' learning and achievement. Limited financial resources and limited ability to direct system-wide pedagogies require leaders to weigh decisions very carefully. The outcomes of this study may provide school leaders with an understanding of the relationship between PLC implementation and students' achievement.

## Research Design

This study employed a quantitative research design. A brief survey was emailed to elementary principals throughout the Minnesota Elementary Principals' Association's (MESPA) central, northern, northeast, west, southwest, and southeast divisions of Minnesota. Each building must have included third-graders and/or fifth-graders that participated in the

Minnesota Comprehensive Assessments (MCAs) during the 2018-2019 school year. Principals completed a survey that identified their building's implementation phase of the DuFour model of professional learning communities.

Students' achievement data were collected from the Minnesota Department of Education's website, specifically, the All Academic Accountability Tests Report for 2019 math, reading, and science MCAs. Proficiency ratings for all Minnesota schools were located within that report which allowed for effective and efficient data analysis.

**Research Questions**

This data analysis attempted to answer the following questions:

1. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools?
2. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools?
3. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools?

**Hypotheses**

Null Hypothesis One: There is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools.

Alternative Hypothesis One: There is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools.

Null Hypothesis Two: There is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools.

Alternative Hypothesis Two: There is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools.

Null Hypothesis Three: There is no relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools.

Alternative Hypothesis Three: There is a relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools.

**Sampling Design**

This study focused on the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading and math proficiency achievement as well as fifth-grade MCA science proficiency achievement in rural elementary schools. The Minnesota Elementary Principals' Association (MESPA) consists of 12 divisions throughout the state of Minnesota. Email communication was sent to four of those divisions totaling 299 principals in the central, northern, northeast, west, southwest, and southeast

divisions of the MESPA. The email was not sent to the seven-county metropolitan elementary schools to ensure this study maintained a rural focus. Using this approach employed the convenient sampling processes as they were nonrandom and easily accessible samples. In total, there were 72 responses to the survey received from the 299 rural elementary school principals contacted.

**Instrumentation**

Two instruments were utilized in this study. The first was a brief survey asking respondents to identify the school building that he/she leads and the school's implementation phase of the DuFour model of professional learning communities. The implementation phase options included:

- The school is not implementing the DuFour model of PLCs.
- Pre-Initiation Stage – The school has not yet begun to discuss the DuFour model of PLCs.
- Initiation Stage – – The school has just begun to discuss and initiate the DuFour model of PLCs, but it has not spread building-wide. (Examples: Initial conversations in building leadership team meetings and/r a couple of teachers have attended a PLC institute for training)
- Implementation Stage – The school has commenced implementing the DuFour model of professional learning communities. Many grade levels are engaged in the model while others are compiling rather than committing. (Examples: Third grade is not engaging in PLCs but are asking questions

and/or several teachers have gone to a PLC institute for training and are implementing practices)

- Developing Stage – Staff are embracing the culture and are asking for system alignment to support the implementation and sustainability of the DuFour model of PLCs. The focus has transitioned to "Why are we doing this?" to "Can we have more time to do this?" (Examples: All staff members have attended a PLC institute for training and are implementing practices and/or staff members are asking for weekly early or late releases for PLC work)
- Sustaining Stage – The DuFour model of PLCs is deeply embedded into the culture of the school. IT is the driving force of daily work of staff.

The second instrument utilized for this study was the Minnesota Comprehensive Assessments (MCAs). Minnesota elementary school students take the Minnesota Comprehensive Assessment (MCA) annually in the Spring, with the exception of 2020 due to COVID-19. The MCAs are the standardized test the State of Minnesota utilizes to be in compliance with federal law, specifically, the Every Students Succeeds Act. The MCAs have been tested for validity and reliability. These assessments help districts measure student progress toward Minnesota's academic standards and also meet state legislative requirements (Minnesota Department of Education, 2021).

In the reading, math, and science assessments students can earn the following evaluation:

- Does Not Meet the Achievement Standards
- Partially Meets the Achievement Standards

- Meets the Achievement Standards
- Exceeds the Achievement Standards

Students are "proficient" when they receive a "Meets the Achievement Standards" or "Exceeds the Achievement Standards" benchmark (Minnesota Department of Education, 2021). The "proficiency" label was used in this study.

**Variables**

The independent variable in the study was the implementation phase of the DuFour model of professional learning communities in rural elementary schools. The dependent variable was student academic achievement, which was measured by the percent proficiency on the third-grade Reading Minnesota Comprehensive Assessment (MCA), third-grade Math Minnesota Comprehensive Assessment (MCA), and fifth-grade Science Minnesota Comprehensive Assessment (MCA).

**Data Collection**

**Survey data.** A letter of introduction was sent via email to all active elementary principals in the central, northern, northeast, west, southwest, and southeast divisions of the MESPA. Within that letter was an invitation to participate in this study. A copy of that letter can be found in Appendix A. Principals were provided with two weeks to complete the brief survey with a reminder at the one-week mark as seen in Appendix B. Informed consent (Appendix C) was included with both emails.

**Secondary data.** Students' achievement data were collected from the Minnesota Department of Education's website, specifically, the All Academic Accountability Tests Report. Data were disaggregated by year (2019), subject (reading, math, and science), and

grade level (third and fifth) for the schools with the DuFour model of professional learning communities implementation phase survey results. Students were marked as "proficient" if they earned a score of "meets the achievement standards" or "exceeds the achievement standards."

**Data Analysis**

Data analysis was completed using the Pearson Product-Moment Correlation (Pearson *r*). This analysis identified if there were correlations between the phases of implementation of the DuFour model of professional learning communities and third-grade proficiency achievement on the MCAs in math and reading as well as fifth-grade proficiency achievement in science.

The Pearson *r* was a measure of the correlation between the dependent variable and independent variable. The Pearson *r* determined a line of best fit between two variables, and the Pearson *r* coefficient specified how far away the data points were away from the line of best fit. These coefficients could have varied between -1 and +1. A 0 would have indicated no relationship while a +1 would have indicated a positive relationship (implementation phase and high levels of students' proficiency achievement), and a -1 would have indicated a negative relationship (implementation phase and low levels of students' proficiency achievement).

The unit of analysis within this study was the school. The independent variable was the implementation phase of the DuFour model of professional learning communities. The dependent variable was the proficiency achievement of third-grade students in rural

elementary schools on the MCAs in reading, math, and science. The analysis outcomes of this study assisted in accepting or rejecting the null hypotheses.

## Limitations and Delimitations

**Limitations.** A limitation of this study was the challenge of receiving responses from the 299 principals in the central, northern, northeast, west, southwest, and southeast divisions of the MESPA. According to Lindemann (2019), the average response rate for email surveys is 30%. The 72 completed surveys reflect a 24% response rate, which may have been due to the workload of elementary principals balancing the demands of the job and those added by COVID-19. Participants may have chosen not to partake in this study if they were concerned that they may be identified and their achievement history may have influenced their participation. Participants were assured confidentiality and the study's sample description was careful to not include identifiers.

A second limitation of this study was the loose definitions around the DuFour model of professional learning communities as districts tend to morph the three big ideas, and four guiding questions into their own definitions. Principals interpret their version of PLCs as a DuFour model, however, they may not have been in alignment with the four guiding questions and three big ideas.

A third limitation of this study was the variation in the interpretation by the 299 principals in the central, northern, northeast, west, southwest, and southeast divisions of the MESPA of the phases of implementation of the DuFour model of professional learning communities. The study did not include a fidelity check. Variations in definitions and interpretations may have been more pronounced due to self-reporting. There were no benefits

to reporting overly positive implementation, so it is anticipated that principals responded honestly.

A fourth limitation of this study was the Minnesota Comprehensive Assessment as the only instrument. The results of standardized tests are difficult to draw conclusions from as there are a variety of factors that may influence them. Lack of sleep, change in personal life, hunger, and other life events can have an impact on the outcome of an assessment. Triangulating data with classroom assessments may have strengthened the study's findings. Also, the researcher did not administer the MCAs, therefore, consistent procedures were not guaranteed. The Minnesota Department of Education has established strict administration protocols for districts, buildings, and teachers.

A fifth limitation of this study was that rural elementary schools where studies and findings cannot be generalized to suburban and urban schools. Rural elementary schools were selected as they are the settings in which the researcher has experience.

The sixth limitation of this study was that the COVID-19 pandemic was present and school districts were balancing multiple demands in the spring between administering statewide assessments and adjusting to continuously changing safety guidance. The demands of a traditional school year in conjunction with the COVID-19 pandemic created limitations on participation.

**Delimitations.** A delimitation to this study is the fact that it does not include private schools, charter schools, middle schools, high schools, and multiple elementary grades that take the MCAs. Public schools were selected because assessment data was available and easy to access.

## Ethical Research Considerations

In every research project, there are ethical considerations to account for. In this study, an ethical consideration was the sample selection and analysis of the data. The sampling design process included all elementary principals throughout the central, northern, northeast, west, southwest, and southeast divisions of Minnesota that were members of MESPA; participants were not hand-selected. Data was kept confidential and will only be used for this study. As a result, there was minimal risk to participants.

The researcher retained an expert quantitative methodologist for analysis as to not sway the findings (Creswell, 2009). When writing the findings, it was important to not suppress, falsify, or invent findings to meet the researcher's or audience's needs (Creswell, 2009). Actions such as those are considered to be scientific misconduct and must not be practiced (Neuman, 2000).

Ethical principles for researchers were included in The Belmont Report (1978). This report provided guidance for researchers in the area of protecting participants and their well-being. In addition, The Belmont Report also stressed the importance of obtaining consent from participants. Informed consent was included with the invitations to participate. Consent was implied with the completion of the survey. Public data was taken from the Minnesota Report Card on the Minnesota Department of Education website.

The ethical completion of research is of utmost importance. The researcher successfully completed the CITI program in social science research ethics. In addition, IRB approval was obtained through Bethel University prior to this study's completion

# Chapter Four: Results

## Introduction

The purpose of this study was to determine if there was a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade reading and math MCA proficiency achievement as well as fifth-grade science MCA proficiency achievement in rural elementary schools. Data for this study were collected using an implementation phase survey sent via Qualtrics to rural elementary school principals and Minnesota Comprehensive Assessment proficiency data.

The researcher collaborated with personnel from the University of Minnesota to analyze data collected using the Statistical Package of the Social Sciences (SPSS). The Pearson Product-Moment Correlation (Pearson *r*) was used to measure the relationship between variables. This chapter contains a discussion of the analysis results, including the assumptions and correlations.

## Discussion of Sample

The researcher obtained the contact information for this study's sample from the Minnesota Elementary Principal Association's (MESPA) website (www.mespa.net). On May 18, 2021, the website showed 467 members classified as rural elementary principals. Rural elementary principals were identified as those outside the seven-county metropolitan area in the State of Minnesota. Of the 467 members, 299 principals were identified as active in the organization and currently practicing in the field. The researcher sent an offer to participate via email to the 299 identified principals (Appendix A). The first email sent by the

researcher generated 34 responses, all of which agreed to participate. Seven of those responses indicated that the school was not implementing the DuFour model of professional learning communities.

The researcher sent a second email containing an offer to participate (Appendix B) was sent to the remaining 265 principals that had not yet responded. After the second email invitation, an additional 27 members agreed to participate. One declined to participate, and seven indicated that the school is not implementing the DuFour model of professional learning communities. Five did not designate a stage of implementation. A third and final invitation to participate was sent (Appendix B) to the remaining 238 principals who had not responded. After the third email invitation, 11 more principals responded. Two indicated that the school is not implementing the DuFour model of professional learning communities, and four did not designate a stage of implementation. Table 1 and Table 2 below provide additional information related to MCA Proficiency for Sample and a List of Schools, Responses, and Proficiency.

Table 1

*MCA Proficiency for Sample*

| | Mean | n | SD |
|---|---|---|---|
| Math Proficiency | 66.84 | 58 | 14.27 |
| Reading Proficiency | 53.55 | 58 | 13.53 |
| Science Proficiency | 56.93 | 48 | 15.22 |

Table 2

*List of Schools, Responses, and Proficiency*

| School Identifier | DuFour Implementation | Percent Proficient in Math | Number Tested in Math | Percent Proficient in Reading | Number Tested in Reading | Percent Proficient in Science | Number Testing in Science |
|---|---|---|---|---|---|---|---|
| School A | 5 | 85.80 | 162 | 162 | 73.46 | | |
| School B | 1 | 22.89 | 83 | 83 | 21.69 | | |
| School C | 4 | 47.31 | 186 | 186 | 37.63 | | |
| School D | 1 | 52.78 | 36 | 37 | 43.24 | | |
| School E | 6 | 57.58 | 99 | 99 | 43.43 | | |
| School F | 1 | 60.77 | 130 | 129 | 49.61 | | |
| School G | 4 | 63.96 | 111 | 110 | 48.18 | | |
| School H | 6 | 64.91 | 57 | 58 | 50.00 | | |
| School I | 5 | 66.67 | 45 | 45 | 51.11 | | |
| School J | 3 | 67.86 | 140 | 141 | 48.23 | | |
| School K | 1 | 78.52 | 149 | 149 | 71.81 | | |
| School L | 6 | 83.44 | 151 | 151 | 78.15 | | |
| School M | 6 | 56.72 | 67 | 67 | 38.81 | 1 | |
| School N | 1 | | 1 | 1 | | 5 | |
| School O | 2 | | 3 | 3 | | 10 | 80.00 |
| School P | 4 | 70.59 | 17 | 18 | 50.00 | 14 | 42.86 |
| School Q | 3 | 53.85 | 26 | 26 | 46.15 | 34 | 70.59 |
| School R | 5 | 50.00 | 24 | 25 | 44.00 | 35 | 74.29 |
| School S | 6 | 54.90 | 51 | 51 | 45.10 | 35 | 42.86 |
| School T | 1 | 80.00 | 35 | 35 | 62.86 | 36 | 75.00 |
| School U | 1 | 92.86 | 28 | 28 | 71.43 | 37 | 75.68 |
| School V | 4 | 65.12 | 43 | 43 | 53.49 | 40 | 47.50 |
| School W | 4 | 71.05 | 38 | 38 | 60.53 | 42 | 40.48 |
| School X | 1 | 63.89 | 36 | 36 | 52.78 | 43 | 67.44 |
| School Y | 1 | 54.55 | 44 | 45 | 33.33 | 47 | 51.06 |
| School Z | 5 | 58.93 | 56 | 56 | 60.71 | 48 | 54.17 |
| School AA | 6 | 100.00 | 45 | 45 | 71.11 | 48 | 47.92 |
| School BB | 4 | 48.72 | 39 | 39 | 35.90 | 54 | 48.15 |
| School CC | 4 | 64.29 | 56 | 56 | 46.43 | 54 | 74.07 |
| School DD | 4 | 74.51 | 51 | 52 | 48.08 | 55 | 76.36 |
| School EE | 6 | 38.60 | 57 | 57 | 19.30 | 58 | 60.34 |
| School FF | 1 | 61.67 | 60 | 60 | 53.33 | 60 | 76.67 |
| School GG | 1 | 70.83 | 48 | 49 | 61.22 | 60 | 76.67 |
| School HH | 2 | 41.89 | 74 | 73 | 35.62 | 67 | 29.85 |
| School II | 5 | 66.67 | 60 | 60 | 48.33 | 68 | 39.71 |
| School JJ | 2 | 80.00 | 45 | 45 | 48.89 | 68 | 61.76 |
| School KK | 4 | 58.62 | 58 | 58 | 50.00 | 70 | 54.29 |
| School LL | 1 | 66.67 | 54 | 55 | 54.55 | 71 | 66.20 |
| School MM | 5 | 86.11 | 72 | 72 | 75.00 | 73 | 61.64 |
| School NN | 6 | 73.08 | 78 | 78 | 64.10 | 75 | 41.33 |

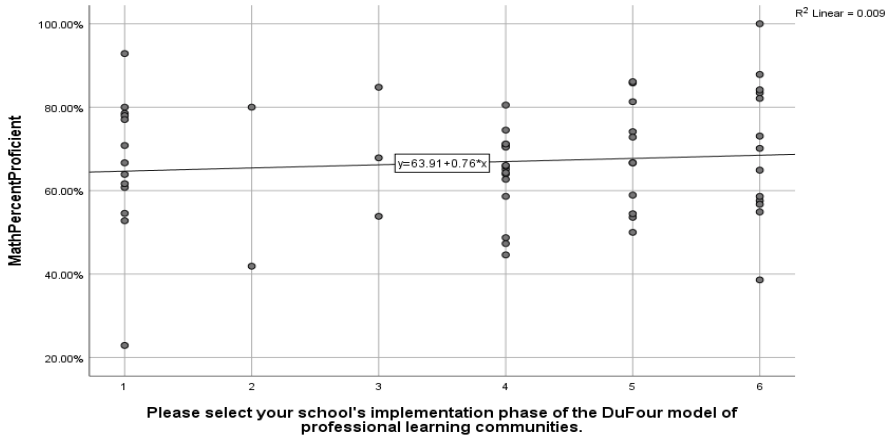
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| School OO | 4 | 62.71 | 59 | 59 | 49.15 | 77 | 58.44 |
| School PP | 4 | 44.59 | 74 | 74 | 36.49 | 78 | 25.64 |
| School QQ | 6 | 87.84 | 74 | 75 | 73.33 | 78 | 43.59 |
| School RR | 5 | 74.14 | 58 | 58 | 65.52 | 81 | 61.73 |
| School SS | 4 | 65.85 | 82 | 82 | 46.34 | 83 | 42.17 |
| School TT | 6 | 70.13 | 77 | 77 | 51.95 | 85 | 77.65 |
| School UU | 5 | 53.62 | 69 | 69 | 46.38 | 93 | 27.96 |
| School VV | 6 | 58.62 | 87 | 86 | 45.35 | 93 | 40.86 |
| School WW | 6 | 82.11 | 95 | 96 | 69.79 | 93 | 56.99 |
| School XX | 5 | 72.82 | 103 | 103 | 60.19 | 96 | 65.63 |
| School YY | 6 | 84.16 | 101 | 101 | 70.30 | 104 | 54.81 |
| School ZZ | 5 | 54.46 | 101 | 101 | 49.50 | 117 | 42.74 |
| School AAA | 1 | | | | | 128 | 62.50 |
| School BBB | 4 | 70.43 | 115 | 114 | 58.77 | 130 | 76.92 |
| School CCC | 1 | 77.97 | 118 | 119 | 63.87 | 135 | 49.63 |
| School DDD | 1 | 77.05 | 122 | 124 | 58.87 | 148 | 69.59 |
| School EEE | 4 | 66.05 | 162 | 163 | 47.24 | 152 | 61.18 |
| School FFF | 4 | 80.52 | 154 | 155 | 60.00 | 170 | 49.41 |
| School GGG | 4 | 71.20 | 184 | 183 | 63.93 | 183 | 60.66 |
| School HHH | 5 | 81.32 | 182 | 183 | 66.67 | 197 | 53.81 |
| School III | 3 | 84.79 | 217 | 218 | 74.77 | 221 | 76.92 |
| School JJJ | 1 | | | | | 433 | 36.95 |

## Findings

**Hypothesis one.** Null Hypothesis one was that there is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools. The alternative hypothesis was that there is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools. A correlation between the Phases of Implementation survey responses and students' achievement proficiency scores was completed. The sample size was 58 ($n = 58$). The alpha level used to test the significance of the relationship was $p < .05$. The results suggest there is not a significant relationship between implementation of the DuFour model and math proficiency ($r = .097$, $p = .470$, $n = 58$). Therefore, the null hypothesis was not rejected. There was no significant, linear

relationship between the implementation phase of the DuFour model of professional learning communities and students' math achievement proficiency scores.

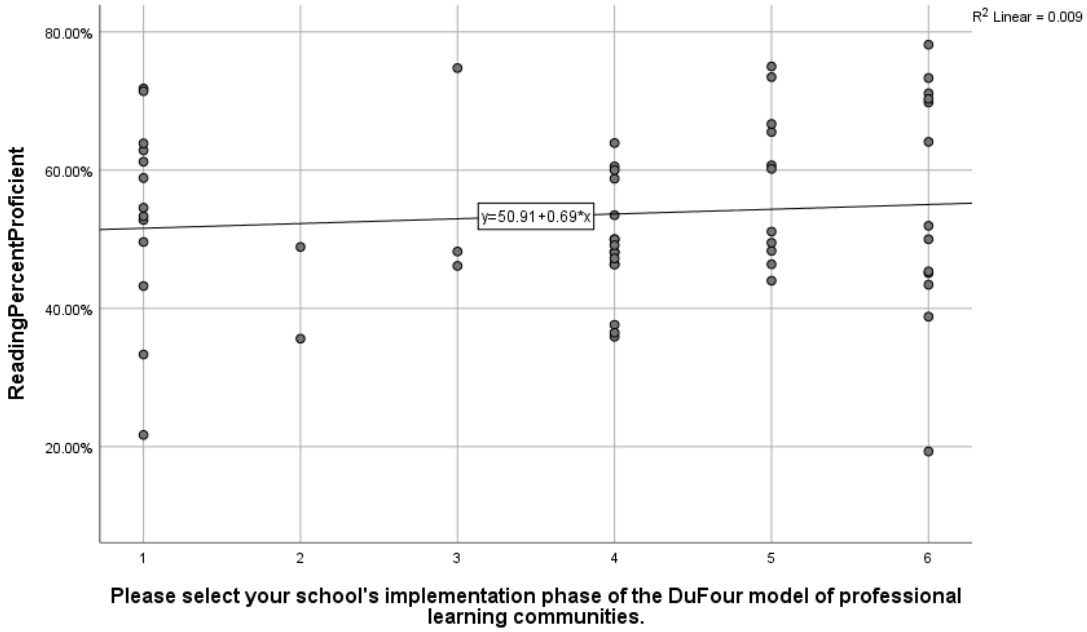
*Figure 1.* Scatterplot of the Relationship Between DuFour Implementation Phase and Math Proficiency.




**Hypothesis two.** Null hypothesis two was that there is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools. The alternative hypothesis was that there is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools. A correlation between the Phases of Implementation survey responses and students' achievement proficiency scores was completed. The sample size was 58 ($n = 58$). The alpha level used to test the significance of the relationship was $p < .05$. The results suggest there is not a significant relationship between implementation of the DuFour model and reading proficiency ($r = .099$, $p = .474$, $n = 58$). Therefore, the null hypothesis was not rejected. There was no significant, linear

relationship between the implementation phase of the DuFour model of professional learning communities and students' reading achievement proficiency scores.

*Figure 2.* Scatterplot of the Relationship Between DuFour Implementation Phase and Reading Proficiency.




**Hypothesis three.** Null hypothesis three was that there is no relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools. The alternative hypothesis was that there is a relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools. A correlation between the Phases of Implementation survey responses and students' achievement proficiency scores was completed. As notated in Table 3, the sample size was 48 ($n$ = 48). The alpha level used to

test the significance of the relationship was $p < .05$. The results suggest a significant and negative relationship between the implementation of the DuFour model and reading proficiency ($r = -0.318$, $p = .028$, $n = 48$) as notated in Table 4. Therefore, the null hypothesis was rejected. There is a significant, negative relationship between the implementation phase of the DuFour model of professional learning communities and students' science achievement proficiency scores.

*Figure 3.* Scatterplot of the Relationship Between DuFour Implementation Phase and Science Proficiency.

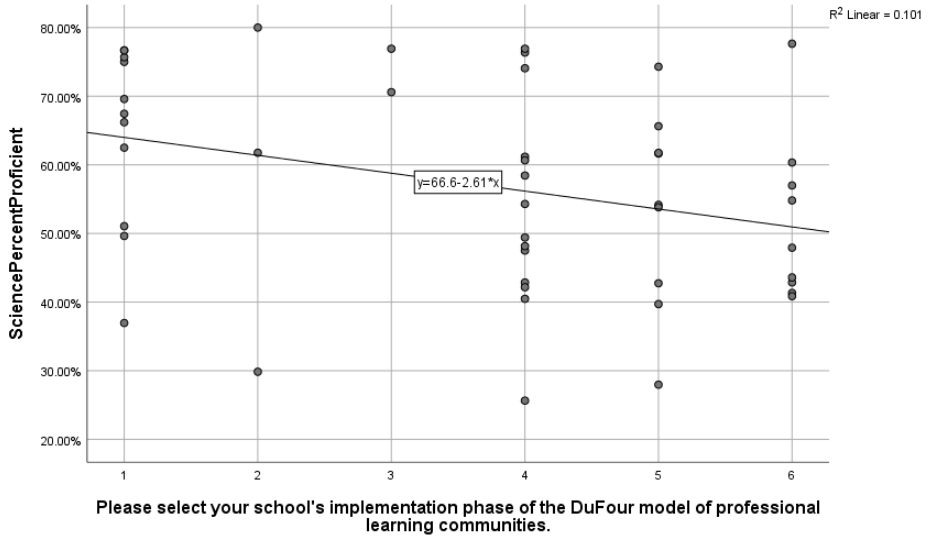


Table 3

*Correlation Matrix of Variables*

| | DuFour Implementation Level | Math Proficiency | Reading Proficiency | Science Proficiency |
|---|---|---|---|---|
| DuFour Implementation Level | 1 | | | |
| Math Proficiency | .097<br>$n = 58$ | 1 | | |
| Reading Proficiency | .099<br>$n = 58$ | .901**<br>$n = 58$ | 1 | |
| Science Proficiency | -.318*<br>$n = 48$ | .293*<br>$n = 45$ | .248<br>$n = 45$ | 1 |

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

**Summary of Findings**

In summation, null hypothesis one was not rejected as there was no significant linear relationship between the implementation phase of the DuFour model of professional learning communities and students' math achievement proficiency scores. The null hypothesis two was not rejected. There was no significant, linear relationship between the implementation phase of the DuFour model of professional learning communities and students' reading achievement proficiency scores. Lastly, null hypothesis three was rejected. There was a significant, negative relationship between the implementation phase of the DuFour model of professional learning communities and students' science achievement proficiency scores.

Table 4

*Overview of Results*

| Hypothesis | r coefficient | P |
|---|---|---|
| Null Hypothesis One: There is no relationship between the implementation phase of the DuFour model of professional | .097 | .470 |

| | | |
|---|---|---|
| learning communities and third-grade MCA math proficiency achievement in rural elementary schools. | | |
| Null Hypothesis Two: There is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools. | .099 | .474 |
| Null Hypothesis Three: There is no relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools. | .318 | .028 |

# Chapter Five: Discussion, Implications, and Recommendations

## Overview of the Study

The purpose of this study was to determine if there was a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade reading and math MCA proficiency achievement as well as fifth-grade science MCA proficiency achievement in rural elementary schools. The data for this study were collected using an implementation phase survey sent via Qualtrics and Minnesota Comprehensive Assessment proficiency data.

The researcher analyzed data collected using the Statistical Package of the Social Sciences (SPSS). The Pearson Product-Moment Correlation (Pearson *r*) was used to measure a relationship. Chapter Five reviews this study and addresses future implications.

## Research Questions

Three questions were researched within this study:

1. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools?
2. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools?
3. Is there a relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools?

## Hypotheses

There were three null hypotheses and three alternative hypotheses (six total) proposed within this study. Null hypotheses one and two were not rejected, and null hypothesis three was rejected.

Null Hypothesis One: There is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools.

Alternative Hypothesis One: There is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA math proficiency achievement in rural elementary schools.

Null Hypothesis Two: There is no relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools.

Alternative Hypothesis Two: There is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade MCA reading proficiency achievement in rural elementary schools.

Null Hypothesis Three: There is no relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools.

Alternative Hypothesis Three: There is a relationship between the implementation phase of the DuFour model of professional learning communities and fifth-grade MCA science proficiency achievement in rural elementary schools.

## Conclusions

Data analysis found that the implementation phase of the DuFour model of professional learning communities did not have a significant relationship with third-grade proficiency in math or reading and had a negative correlation with fifth-grade science proficiency. Considering previous research focused on PLCs and students' academic achievement (Archibald, 2016), it seemed probable that there was an expectation that there would be a positive correlation between the sustaining phase of implementation of the DuFour model of professional learning communities and students' achievement. However, after the Pearson -r was completed, the *p*-value was found to be .470 in math, .474 in reading, and .028 in science. Thus, null hypotheses one and two were not rejected, and null hypothesis three was rejected.

Based on the results of this study, it can be concluded that in rural elementary schools, the phase of implementation of the DuFour model of professional learning communities will not correlate to increased levels of students' achievement. However, several factors will be considered and discussed in the next section, Implications and Recommendations.

## Implications and Recommendations

An implication for this study is that simply implementing the DuFour model did not lead to more significant achievement, highlighting the complexity of effective PLC work. Understanding the complexities and applying appropriate ongoing job-embedded training, allocation of resources, leadership, and accountability are important for future policy development. The small sample size in this study may not have produced findings

representative of rural schools at large. In the future, incentives for participation may increase the sample size. With only 24% participation, there was an abundance of data remaining to be collected. Though this study focused on rural elementary schools, a larger sample and broader perspectives may be gained by including all Minnesota Elementary School Principals' Association members.

This study's results included those elementary schools that have not implemented the DuFour model of professional learning communities. Specifically, of the respondents, 16 indicated that they were not implementing the DuFour model of professional learning communities. The researcher did not formally analyze the data, excluding those that have not implemented the model, which could be an area for future research.

This study focused on the implementation phase of the DuFour model of professional learning communities with no pre-implementation data compared to post-implementation. A future study could be conducted longitudinally, beginning with proficiency data pre-implementation followed by post-implementation proficiency data. Such a study may result in greater fidelity to the DuFour model and contextualize the data with more consistent student demographics.

Consideration of future research should include disaggregating data by subgroups, such as socioeconomic status, race, ethnicity, special education, and English learners. Disaggregating the data allows for a more robust analysis. Findings could guide districts in better serving marginalized populations and addressing the achievement gap.

Future studies may choose to include the voice of teachers within each rural elementary school. This study included only elementary principals within rural elementary schools.

That provided one individual's perspective based on observations during a snapshot in time. Teachers may provide better insight regarding the phase of implementation as they are consistently engaged in the work. Given the implementation planning required by school leaders, a principal may consider an implementation stage as sustaining, whereas a teacher may consider the implementation in the initiation stage.

A qualitative study may provide information not to be discovered through the implementation phase survey utilized in this study. Interviewing teachers could elicit a rich, deep understanding of the influence implementation had on pedagogy and student learning that could not be gathered in a quantitative approach.

Specifying the DuFour model of professional learning communities may have created a barrier within this study as each school district may define that differently. Because this study included the solicitation of information from 299 rural elementary school principals, each principal was left to interpret their definition of the DuFour model of professional learning communities. In a future study, it would be recommended to work directly with Solution Tree, Inc to identify schools that have been identified as implementing the DuFour model of professional learning communities with fidelity. Utilizing that approach may bring consistency to the research and bolster validity.

Lastly, many districts throughout the State of Minnesota and the United States utilize the DuFour model of professional learning communities. Perhaps future research could focus on how the DuFour model of professional learning communities could be improved. Questions around what is working within the model and what is not working could be explored.

## Concluding Comments

The case for the DuFour model of professional learning communities is strong, and research supports practices within the model (DuFour, 2004; Mullen & Schunk, 2010; Soares & Galisson, 2018). Research regarding the specific practice of the Dufour model or professional learning communities is minimal for various reasons, from its loose definition by practitioners to the interpretation of practices.

Components within the DuFour model of professional learning communities are supported by research, such as collaboration, group learning, reflective inquiry, collective responsibility, and shared values and vision (Stoll et al., 2006). The findings in this study did not align with previous research in the field, calling for further studies to be completed to understand effective personalized learning communities better.

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# Appendices

## Appendix A - Initial Email Invitation

Dear [Principal Name],

My name is Bill Adams and I'm currently a doctoral student at Bethel University. My dissertation research centers on the implementation phases of professional learning communities within rural elementary schools and students' achievement. I am requesting your participation by completing a **very brief, one minute** online survey.

If you agree to participate in the survey, please click here or enter this URL in your web browser: https://bit.ly/top5pog. Informed consent is attached to this email. Completing the survey implies your consent. Please complete this survey **no later than May 28 at 12:00 pm**.

Participation is voluntary and you are free to withdraw from the study at any time with no impact on your relationship with Bethel University. If the results of this study were to be published, no identifying information will be used.

If you have any questions about this study, you may contact me (AdamsW@nls.k12.mn.us). This study has been reviewed and approved by the Bethel University Institutional Review Board (IRB).

I thank you in advance for assisting me in completing this study.

Sincerely,

William (Bill) Adams
Bethel University Doctoral Student

**Appendix B - Reminder Email**

Dear [Principal Name],

Thank you to the many principals who completed the survey and contributed to my dissertation study. If you have not participated, there is still time! My dissertation research centers on the implementation phases of professional learning communities within rural elementary schools and students' achievement. I am requesting your participation by completing a **very brief, one minute** online survey.

If you agree to participate in the survey, please click here or enter this URL in your web browser: https://bit.ly/top5pog. Informed consent is attached to this email. Completing the survey implies your consent. Please complete this survey **no later than June 4 at 12:00 pm**.

If you have any questions about this study, you may contact me (AdamsW@nls.k12.mn.us). This study has been reviewed and approved by the Bethel University Institutional Review Board (IRB).

I thank you in advance for assisting me in completing this study.

Sincerely,

William (Bill) Adams
Bethel University Doctoral Student

**Appendix C - Informed Consent**

You are invited to participate in a study of professional learning communities. You were selected as a possible participant in this study because you are a principal in Minnesota at a rural elementary school. This research is being conducted as part of my dissertation at Bethel College.

If you decide to participate, I will use this information for my dissertation. The purpose of this study is to determine if there is a relationship between the implementation phase of the DuFour model of professional learning communities and third-grade reading and math MCA proficiency achievement as well as fifth-grade science MCA proficiency achievement in rural elementary schools. This brief survey will take approximately two minutes to complete. Your personal identity will not be disclosed and collected will benefit principals in understanding the relationship between phases of PLC implementation and students' achievement.

Any information obtained in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission. In any written reports or publications, no one will be identified or identifiable and only aggregate data will be presented. The outcomes of this study will be shared with various institutions, such as, the Minnesota Association of School Administrators, Solution Tree, Inc. and others as deemed appropriate. The outcomes will not include personally identifiable information.

Your decision whether or not to participate will not affect your future relations with Bethel University in any way. If you decide to participate, you are free to discontinue participation at any time without affecting such relationships.

This research project has been reviewed and approved in accordance with Bethel's Levels of Review for Research with Humans. If you have any questions about the research and/or research participants' rights, please call my dissertation advisor, Dr. Tracy Reimer at 651.635.8502.

You may keep a copy of this document for your records. Completing the survey implies your consent.

**Appendix D - Survey**

Title: The relationship between the implementation phase of the Dufour model of professional learning communities and students' achievement.

Q1: Please select which implementation phase of the DuFour model of professional learning communities you are in.

R1: Pre-initiation Stage: The school has not yet begun to discuss the DuFour model of professional learning communities.

R2: Initiation Stage: The school has just begun to discuss and initiate the DuFour model of professional learning communities, but it has not spread building-wide. (Examples: Initial conversations in building leadership team meetings and/or a couple of teachers have attended a PLC institute for training)

R3: Implementation Stage: The school has commenced implementing the DuFour model of professional learning communities. Many grade levels are engaged in the model while others are compiling rather than committing. (Examples: third-grade is not engaging in PLCs but are asking questions and/or several teachers have gone to a PLC institute for training and are implementing practices)

R4: Developing Stage: Staff is embracing the culture and are asking for system alignment to support the implementation and sustainability of the DuFour model of professional learning communities. The focus has transitioned to "Why are we doing this?" to "Can we have more time to do this?" (Examples: All staff members have attended a PLC institute for training and are implementing practices, and/or staff members are asking for weekly early or late releases for PLC work)

R5: Sustaining Stage: The DuFour model of professional learning communities is deeply embedded into the school’s culture. It is the driving force of the daily work of staff.

R6: The school is not implementing the DuFour model of professional learning communities.