Teachers' inquiry stance: Collaboration through data analysis in a professional learning community

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Teachers’ inquiry stance:
Collaboration through data analysis in a professional learning community

by

Darin Marcus Haack

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Education (Educational Leadership)

Program of Study Committee:
Joanne Marshall, Major Professor
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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this dissertation. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University
Ames, Iowa
2017

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ABSTRACT

The purpose of this qualitative case study was to understand how teachers experience a stance toward inquiry through participation in Professional Learning Communities (PLCs). In order to meet this objective, the following questions framed this research:

1. How do individual teachers make meaning of the epistemological and dialogic aspects of their PLC’s inquiry stance toward student data?
2. How do teachers interpret the influence of their personal inquiry stance toward student data on the stance of their PLC?
3. How do teachers interpret the influence of external supports and constraints on their PLC’s inquiry stance toward student data?

The site of this research was a mid-sized Midwestern high school. The school had used the PLC structure for several years prior to this research. However, a new principal and assistant principal were hired for the 2016-2017 school year, which brought changes to the school’s PLC processes. Eight teachers from five PLCs participated in qualitative, semi-structured interviews. Each participant was interviewed two times over the course of the second semester of the 2016-2017 school year. In addition, three PLCs were observed in meetings during the same time period. Finally, district, school and PLC documents were analyzed.

Findings revealed that participants believed in an optimistic premise that professional collaboration had the potential to improve instruction and student learning. However, differences in the approach to knowledge and practice between individual teachers and their colleagues in the PLC, as well as constraints specific to the school context prevented participants from engaging in inquiry based on student-learning data to the degree desired.
Participants experienced their PLC’s epistemological and dialogic inquiry stance toward student-learning data as a proving stance. Much of their PLC work centered around the development of student learning goals aligned to the Common Core curriculum. When student data was discussed in the PLC, participants experienced the data process as proving the effectiveness of past instruction and generalizing student understanding of past instruction. In addition to spending the majority of the PLC time on the development of student learning goals, participants described much of their conversation centering around task completion, with the PLC agenda directing the work.

Differences in participants’ experiences of stance toward knowledge and practice emerged from this research. Tension existed in how knowledge was privileged. Participant responses demonstrated a belief that a set of best practices for professional collaboration existed, and the teachers felt they were expected to learn these best practices and implement the practices in their work. Participants also placed value in knowledge gained through classroom experience, and some participants expressed concern that the knowledge gained through experience was not valued in the school system. The tension between formal knowledge in the form of best practices and knowledge gained through experience was described as a concern or frustration specific to the context of the school that made inquiry in PLC work much more difficult than anticipated.

The frustration with the difficulty of implementation of PLC work and the tension between different stances toward knowledge and practice resulted in tangible negative effects on the participants in this study. Social relationships were damaged. Some teachers sought compliance with perceived directives and mandates. Other teachers decided to question those same perceptions. Still others remained committed to collaboration and waited for
teachers they considered to be resistant to leave the school so that replacements could be hired with compatible beliefs.

Despite the difficulties and concerns expressed, all the participants expressed a belief that collaboration with colleagues was important to them socially and professionally. Their concerns were with the nature of implementation not the nature of collaboration. Through purposeful discussions on data processes and the ways in which differing stances toward knowledge and practice influence perception, it remains possible for teachers to experience an increasing sense of collective efficacy in their collaborative work.

The results of this study revealed four practical strategies for school leaders to promote collaborative inquiry in schools. These strategies include developing structures that support collaborative inquiry, developing a shared vision that supports collaborative inquiry, developing data processes that support authentic collaborative inquiry, and promoting political and social conditions that support collaborative inquiry. This study also revealed two implications for teachers who participate in PLCs. The strategies for teachers include on-going reflection on images of knowledge and practice and on-going engagement in learning. In addition, the findings revealed suggestions for the use of this case study in both administrator and teacher preparation programs.
CHAPTER 1. OVERVIEW

Introduction

Public schools in America face demands for increased levels of student achievement, the preparation of students for post-secondary education, and ultimately the preparation of a workforce equipped with skills to compete in the global economy (Elmore, 2007b; Hargreaves & Fullan, 2012; McLaughlin & Talbert, 2006). To meet these demands, schools must find ways to continually improve teachers’ instructional practices and construct supports to meet the diverse needs of all learners. School systems are called upon to implement processes in which teachers use multiple sources of student data in collaborative conversations about student learning and instructional improvement (Bocala & Boudett, 2015; Datnow & Hubbard, 2015; Marsh, Bertrand, & Huguet, 2015).

The demands placed on schools to increase student achievement and to implement new curriculum such as the Common Core have led policy makers and educational leaders to search for professional development opportunities that equip teachers with the skills necessary to ensure that all students succeed (Bezzina, 2006). The focus on high levels of achievement for all students raises new questions about what it means to be an effective teacher, how to reduce teacher isolation and increase teacher collaboration, and how to best use student achievement data to drive decision making (Hargreaves, 1994; Hargreaves & Fullan, 2012). In an attempt to address these questions, and in an effort to increase teacher capacity to meet student need, many schools implemented teacher collaboration through Professional Learning Communities (PLCs).

The theoretical concept of teacher collaboration has a rich history. For example, Wenger (1998, 2006) coined the term “community of practice” when studying apprenticeship
as a learning model. A community of practice refers to a group of people who are interested in a concept and learn how to improve their practice through regular interaction and discussion about the concept. Members of a community of practice “develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems – in short, a shared practice” (Wenger, 2006, p. 2). Rosenholtz (1991) identified key concepts of a PLC several years before the term was widely used, stating, “it is assumed that improvement in teaching is a collective rather than individual enterprise and that analysis, evaluation and experimentation in concert with colleagues are conditions under which teachers improve” (p. 73). She identified schools where teachers work in isolation as “stuck,” whereas schools where teachers worked collaboratively were “moving.” Stuck schools had a negative correlation with student learning gains.

Proponents have declared Professional Learning Communities to be “the most promising strategy for meeting the challenge of helping all students learn at high levels” (DuFour, DuFour, Eaker, & Many, 2010, p. 9). This promise inspired schools across the United States to implement PLC practices (Lieberman & Miller, 2008; Little, 2003; McLaughlin & Talbert, 2006). Richard and Rebecca DuFour, along with Robert Eaker, who wrote multiple books and hosted workshops on professional communities for thousands of educators, stated that their goal in writing their books was to persuade educators to implement PLCs. The DuFours and Eaker defined a PLC as an “ongoing process in which educators work collaboratively in recurring cycles of collaborative inquiry, and action research to achieve better results for the students they serve” (DuFour et al., 2010, p. 11). Collaborative work in a PLC offers the potential for members to learn from one another’s strengths, thereby building a shared repertoire of ideas, practices, and experiences that are
used to understand new situations and guide new practice (Lieberman & Miller, 2008).

However, two decades have passed since Hord (1997) defined PLCs, and in some cases the promise of collaboration is yet to be realized (Datnow, 2011). In many cases the promise has not been realized because effective PLCs require not only collaborative efforts on the part of administrators and teachers, but also a culture of collaborative trust in order to be effective (Hallam, Smith, Hite, Hite, & Wilcox, 2015).

This case study research examined the ways that a group of teachers experienced the collaborative analysis of student-learning data to construct new learning and skills by means of collaborative inquiry, what Cochran-Smith and Little called “knowledge-of-practice” (1999, p. 250). Participants in this study were asked to describe the stance their PLC took toward inquiry, the ways in which their PLC engaged in dialogue around student-learning data, and what they experienced as supports and barriers to their professional collaboration. Effective PLCs depend on teachers’ abilities to engage in collaborative inquiry around student data to modify and develop instructional practices that meet the needs of all students. Effective PLCs depend on teachers being able to exercise individual and collective efficacy to identify problems of practice and pursue new knowledge through inquiry.

**Statement of the Problem**

Many schools have structured teachers into Professional Learning Communities in an effort to increase student achievement (Hamos et al., 2009). The Professional Learning Community model requires schools to implement structural and cultural changes that allow for teacher reflection, inquiry, and the ability to apply new knowledge that will lead to increased student learning. As a result of participation in a PLC, members of the community should be able to speak to the ways that the professional community has improved their
knowledge of student understanding, improved their instructional practice, provided professional learning, and improved collaboration with colleagues. Specifically, participation in a PLC should result in teachers who are able to understand and explain the ways that they collaboratively examine the evidence of student learning and use that analysis to inform areas for instructional improvement. However, research has been unclear as to how exactly teachers use student data to shape their decision making (Datnow & Hubbard, 2015; Little, 2012). In addition, PLC policy texts and guidebooks marketed to teachers and administrators do not provide sufficient clarity on exactly how educators should collaborate to use data in decision making. While it might seem that making decisions based on data is a straightforward process, the fact that humans select the data and make decisions based on that selection requires research that examines how educators select and use data as well as how data practices could be improved (Spillane, 2012).

To better understand the use of student data within PLCs, it is necessary to understand the meaning that each teacher makes out of his or her experiences in collaboration and in working with student data. Fullan (2007) wrote that the development of shared meaning leads to solutions for problems of practice. Studies have attempted to quantify the effectiveness of the PLC process by measuring changes in student achievement scores after teachers have worked in a PLC (Aylsworth, 2012; Y. Goddard, 2007; Moller, Mickelson, Stearns, Banerjee, & Bottia, 2013; Zito, 2011). Other studies have used qualitative methods to evaluate the effectiveness of the PLC itself, or how aspects of the PLC process such as leadership influence the effectiveness of a PLC (Horn, 2005, 2010; Sayers, 2013; Stollar, 2014). However, more research is required to better understand the meaning that individual PLC members construct from their experience with student data in a PLC (Moss, 2012).
This understanding will help teachers and administrators develop professional development to support data use within PLCs.

**Statement of Purpose**

The purpose of this qualitative case study was to understand how PLC members experience their PLC as a site, where collaborative inquiry and learning takes place, and as a source of collaborative inquiry generated through the analysis of student learning data. The positions that teachers in PLCs take toward inquiry into knowledge and practice determine the PLC’s inquiry stance (Cochran-Smith & Lytle, 1999; Nelson, Slavit, & Deuel, 2012). In order to gain understanding about teachers’ interpretation of inquiry as stance, a framework was used to examine teachers epistemological stance toward inquiry and their dialogic stance toward inquiry (Nelson et al., 2012). The epistemological stance examines the ways that teachers link the data process to a vision of content and learning goals, the ways that teachers link the data process to instructional practices, and the ways that teachers link the data process to student understanding. The dialogic stance examines the dialogic interactions of members of the PLC as they engage in the data process. The dialogic interactions surface similarities and differences of perspective. When a teacher speaks to colleagues during a PLC meeting, the teacher expects a response of some sort, a counter argument, agreement, etc. Therefore, the dialogic stance toward inquiry emerges out of the responses to utterances in PLC conversation and the ways in which the utterances and responses lead to examination of professional knowledge and practice (Bakhtin, 2010). The investigation of these differences creates opportunities for collaborative learning.

The study investigated how individual members of PLCs interpreted the ways that the PLC used student data to establish learning goals, structure their learning, and apply their
learning to their classroom practice. The study investigated how teachers interpreted the relationship between their personal inquiry stance toward student data compared to the inquiry stance of their PLC. Finally, the study examined how individual teachers interpreted their overall experience as a member of a PLC by examining structural supports and constraints within the school context. The site where this research took place provided for a case study of teachers’ experiences in a school where a new administrative team was engaged in efforts to revitalize the work of existing PLCs. This research offers important insight into collaborative work, because it examined PLC work through the individual experiences of teachers rather than foregrounding the PLC as a single unit. The results of this study will be of value to educational leaders as they work to support teachers working in PLCs, because it provides insight into how teachers experienced the use of data within a PLC.

**Research Questions**

This case study examined how teachers at a Midwestern suburban high school interpreted their PLC’s inquiry stance toward student data, their personal inquiry stance toward student data, and how external factors influenced the work of the PLC around student data. The following questions guided the study:

1. How do individual teachers make meaning of the epistemological and dialogic aspects of their PLC’s inquiry stance toward student data?

2. How do teachers interpret the influence of their personal inquiry stance toward student data on the stance of their PLC?

3. How do teachers interpret the influence of external supports and constraints on their PLC’s inquiry stance toward student data?
The answers to the research questions provided insight into how teachers approached the use of data and how the inquiry around data influenced the work of the PLC.

**Significance of the Study**

In the two decades that have passed since Hord (1997) conceptualized and defined the term Professional Learning Community, the use of the term to characterize the organization of schools has become common. Proponents of PLCs continue to claim that PLCs are an important tool for teacher professional development that leads to improved student learning (DuFour, DuFour, & Eaker, 2008; DuFour et al., 2010). These claims amount to “a certain optimistic premise” about PLCs which has led to widespread adoption of PLCs in schools (Little, 2003, p. 916). However, there remains little research on what actually happens when PLCs interact with student learning data (Coburn & Turner, 2012).

The ability to support focused professional development for teachers in a PLC in which teachers have an inquiry stance toward student learning data promises to have a significant impact on the learning culture and student achievement of a school. This qualitative case study is significant, because it provides insight into the ways that meaning is constructed by individual teachers through collective inquiry in a PLC. The study adds to the literature and understanding of the factors that contribute to a PLC being the site and source of professional inquiry and learning based on evaluation of student-learning data.

From a practical standpoint, the findings of this study help educators in the development of a more complete understanding of how teachers view and make meaning of their inquiry stance toward student data and professional collaboration. The findings are meaningful both to school leaders of schools with a PLC model in place, school leaders planning to implement PLCs, and school leaders searching for ways to revitalize the PLC.
process in their school setting. Additionally, the case study assists administrators in a new setting to understand how teachers interpret the ways that school leadership supports the PLCs and their approach toward data.

Summary

The purpose of this qualitative case study was to describe, analyze, and interpret the experiences of teachers working in professional learning communities as they engage in inquiry based on student learning data. Participants were asked to describe how they interpreted the stance toward inquiry of their PLC. The participants were asked to characterize their personal stance toward inquiry, and the ways in which their personal stance compared to that of their PLC. Finally, participants were asked to characterize supports and constraints within the context of the school and how those supports and constraints influenced the participants’ sense of personal and collective efficacy in their PLC work. This study is significant to school leaders who wish to develop and support professional collaboration and inquiry in their school.

Chapter 2 presents a review of the literature related to PLCs, collaborative data processes, and the relationship between school leadership and collaboration. First, PLCs are placed within the context of school reform efforts. Second, PLCs are connected to sociocultural learning theory. The relationship between PLCs and professional inquiry is explored, with a focus on how student-learning data influences collaborative inquiry. Finally, research on the relationship between school leadership and the implementation and support of PLCs is explored.

Chapter 3 outlines the epistemology, theoretical perspective, and methodology used in this study. This chapter describes the context of the unique case studied in this research.
The participants in this study experienced PLCs through the efforts of new administration to revitalize PLC work in the school. The methods of data collection and analysis are presented. Chapter 3 concludes with discussion of ethics, the researcher’s positionality, and limitations and delimitations of the case study.

Chapters 4 and 5 discuss the findings from the case study. Connections are made between this research and the literature. Finally, implications for school leaders, teachers, and preparation programs for both administrators and for teachers are discussed.
CHAPTER 2. LITERATURE REVIEW

The purpose of this qualitative phenomenological case study was to a) explore how teachers make meaning of the inquiry stance of their PLC, b) explore how teachers interpret the relationship between their individual inquiry stance and the stance of their PLC, and c) identify how teachers experience supports and barriers to their collaborative experience.

This study drew upon a literature base that addresses school professional development and improvement initiatives, school reform, data-driven decision making, Professional Learning Communities, and collaborative inquiry. This chapter reviews the literature on school reform and accountability, teacher professionalism, sociocultural learning theory, inquiry as stance, school leadership, professional development, and collective efficacy, with a focus on data use in teacher collaboration, teacher inquiry, and professional learning communities.

Reform and Accountability

In December of 2015, President Barack Obama signed into law the Every Student Succeeds Act (ESSA), which reauthorized the Elementary and Secondary Education Act. The ESSA revises No Child Left Behind and will take effect for the 2017-2018 school year. Two provisions of ESSA are especially relevant to this study. According to the United States Department of Education ("Every Child Succeeds Act," the ESSA:

- Ensures that vital information is provided to educators, families, students, and communities through annual statewide assessments that measure students' progress toward high standards.
- Helps to support and grow local innovations—including evidence-based and place-based interventions developed by local leaders and educators.
Translating federal and state reform mandates into practice has proven to be more difficult than anticipated by politicians and policy makers. Fullan (2007) suggested that one of the reasons that the innovations and reforms prove to be difficult to implement is the lack of capacity both individually on the part of teachers and on the school organization to put the innovation into practice. The lack of capacity leads to the adoption and attempted implementation of reforms without significant change to classroom practice. Fullan (2007) attributed the difficulty of implementation to the fact that top-down change initiatives fail to develop a sense of ownership in teachers while bottom-up change does not produce success on a large scale due to lack of structure.

The demands of external forces of reform such as ESSA have the potential to overload a school and its leadership, leaving them vulnerable to a dependency on packaged reform solutions (DuFour et al., 2008; Fullan, 1998, 2007; Hargreaves & Fullan, 2012; Kanold, 2011). The pressure to improve student achievement has led some schools to adopt the practice of simply teaching to the test, a practice that results in reduced teacher morale (Deal & Peterson, 1999). Other schools adopt a series of reform initiatives in quick succession in an effort to quickly improve results. In such cases, promising new ideas quickly replace once promising ideas. The dependency on the “next best thing” to be the reform that moves a school to annual yearly progress also leads to skepticism on the part of educators (Hargreaves & Fullan, 2012). Political leaders’ and school leaders’ dependency on the next best thing often fosters a culture of “this too shall pass” on the part of teachers. Building the collective capacity of teachers through ongoing collaborative work to find solutions to problems of practice is an alternative to the succession of packaged reform solutions (Lieberman & Miller, 2008).
According to its proponents, the PLC model and data based decision making offer schools the opportunity to end the next best thing/this too shall pass cycle (DuFour et al., 2008). By allowing teachers to collaborate, the PLC model builds a culture in which teachers learn from one another and with one another to build instructional capacity, which will lead to increased student achievement (Hargreaves & Fullan, 2012; Hord, 1997; Lieberman & Miller, 2008; McLaughlin & Talbert, 2006).

**Teacher Professionalism**

The professional orientation of teachers is related to the stance that teachers take toward inquiry and the stance that teachers take toward knowledge and practice. The concept of professionalization draws distinctions between occupations that require little skill and training and occupations which require extensive training including the acquisition of knowledge and skills, the autonomy to use judgement in complex situations, and socialization into professional values (Hoyle, 1982). The development of specialized knowledge for teachers involves learning about research based practices as well as the application of those practices according to the rules and values of the profession (Hoyle & John, 1995). A second component of teacher professionalism is the autonomy to use judgement to act in the best interest of students (Furlong, Whitty, Whiting, Miles, & Barton, 2000). The third component of teacher professionalism involves the responsibility to act within the standards and values of the occupation (Sachs, 2001).

The three components of teacher professionalism raise questions about the relationship between theory and practice (Hoyle, 1982). Traditionally, specialized professional knowledge was obtained primarily in undergraduate programs (Sachs, 2001). Specialized training develops knowledge of subject matter, theory, and instructional
practices, which form a set of best practices that translate into effective teaching practice when implemented with fidelity (Cochran-Smith & Lytle, 1999). The classroom, however, is often an uncertain environment, and therefore, teachers make judgements when applying knowledge, relying not only on best practice but also on past experience or the generation of new strategies. Schon (1995) suggested that the judgements teachers make due to the uncertainty of the classroom make the teaching profession similar to other design professions, such as architecture or musical performance, because teachers use their knowledge to design new teaching strategies. Designing new strategies generates knowledge beyond what is learned in undergraduate preparation programs.

Specialized training for teachers emphasizes learning knowledge that is already known by experts, while the use of professional judgement in uncertain classroom situations utilizes both formal knowledge from experts and knowledge known by an individual teacher developed through their experience. Education improvement and reform agendas have influenced teacher preparation programs to support future teachers to more closely connect theoretical formal knowledge to knowledge gained through experience by having prospective teachers working with expert teachers in practicum and fieldwork experiences as well as reflection on pre-service practice (Cochran-Smith & Lytle, 1999). In addition to knowledge gained through teacher preparation, reform agendas also require teachers to continually rethink their practice and to continue to pursue new specialized knowledge over the course of their career through a process of professional development (Darling-Hammond & McLaughlin, 2011).

Research on the effectiveness of professional development for teachers found that learning that was focused on content knowledge, was inquiry-oriented, and coherent with
other activities in the school context enhanced both teacher knowledge and practice (Garet, Porter, Desimone, Birman, & Yoon, 2001). Borko (2004) found that strong professional learning communities support professional development and instructional improvement and suggested that research exploring professional development in PLCs use sociocultural learning frameworks to examine teacher participation, experience and learning. Fullan (2007) agreed with findings in the Borko study, writing that teacher professionalism and professional development need to be more collaborative, and teachers need to do much more learning in which they are able to test, refine, and receive feedback on the improvements they implement.

**Sociocultural Learning**

The collaborative work of professional learning communities is grounded in sociocultural learning theory. Sociocultural learning theory assumes that learning is a social phenomenon in which individuals work to make sense of information, construct new knowledge based on their prior knowledge, beliefs, and experiences, and through social interactions (Vygotsky, 1978; Wenger, 1998). Rather than conceptualizing knowledge as unchanging and separated from experience, sociocultural learning theory conceptualizes knowledge and learning as being shaped by the context and culture of the site of learning (Merriam, 2001). Examining teacher practice through sociocultural learning theory requires focus on teachers’ everyday activities involving their peers. According to Vygotsky (1978), a mentor or peer with more experience supports learning through modeling and discussion of concepts, routines, and other tasks. The novice teacher internalizes instructional strategies and important knowledge through working collaboratively with an experienced teacher (John-Steiner & Mahn, 1996). Lave and Wenger (1991) described that the meaning of
learning for an individual is developed through the process of becoming a participant in a sociocultural practice. They wrote:

Activities, tasks, functions, and understandings do not exist in isolation; they are part of broader systems of relations in which they have meaning. These systems of relations arise out of and are reproduced and developed within social communities, which are in part systems of relations among persons (Lave & Wenger, 1991, p. 55).

Wenger’s (1998, 2006) later work coined the term “community of practice” when studying apprenticeship as a learning model. A community of practice refers to a group of people who are interested in a concept and learn how to improve their practice through regular interaction (Cuddapah & Clayton, 2011). Members of a community of practice “develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems – in short a shared practice” (Wenger, 2006, p. 2). Members of a community of practice share a commitment to a domain of interest, build relationships through interaction and learning together, and are practitioners who share a repertoire of experiences and methods of addressing recurring problems. PLCs incorporate the ideas of a community of practice through regular collaboration and the development of shared resources for addressing problems of practice.

The phenomenon of isolated teachers in isolated classrooms is recognized as a persistent and common occurrence in American public schools (Fulton, Yoon, & Lee, 2005). Teachers teaching in cultures of isolation become afraid to take risks or try new ideas, leading to stagnation (Hargreaves & Fullan, 2012). Such isolation has allowed teachers to spend their entire career without knowledge of how their instruction and student achievement compares to that of their colleagues (DuFour et al., 2008).
Rosenholtz (1991), in her study of the working conditions of teachers, examined isolation and found that there were two types of cultures in schools, “moving” schools with a focus on collaboration, and, “stuck” schools with a culture of professional isolation. In the “stuck” schools, Rosenholtz found that, “Most teachers and principals become so professionally estranged in their workplace isolation that they neglect each other. They do not often compliment, support, and acknowledge each other’s positive efforts. Indeed, strong norms of self-reliance even invoke adverse reaction to a teacher’s successful performance” (1991, p. 37). This finding is important for teachers and administrators working to transition a stuck school into a moving school.

Elmore (2007a) suggested factors that lead to teacher individualism and isolation. For example, the very architecture of most school buildings with separate classrooms and closed doors fosters isolation and works against improvement. The physical separation and isolation of the school building means that teachers “are psychologically alone even though they are in a densely populated setting” (Sarason, 1996, p. 133). While physical barriers can be removed to one degree or another, the tendency toward self-preservation still leads to feelings of isolation. In some ways, the isolation allows teachers to exercise their judgment in making decisions about instruction and assessment. However, isolation also keeps teachers from receiving valuable feedback that might make instruction and assessment more effective. If teachers do not learn from colleagues, the only feedback they receive is during their formal evaluations. The lack of feedback outside of the evaluation cycle leads to feelings of insecurity (Hargreaves & Fullan, 2012). The PLC provides an opportunity for teachers to examine practice and receive feedback from colleagues rather than relying only on an evaluation process for feedback.
**Professional Learning Communities**

The complexity of the global marketplace in the 1990s brought about new thinking about how corporations develop competitive strategies. Peter Senge (2006) was a proponent of transforming companies into “learning organizations” in which “people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together” (2006, p. 6). According to Senge, there are five disciplines that are necessary for a learning organization to function: a) personal mastery, b) mental models, c) shared vision, d) team learning, and e) systems thinking. The five disciplines emphasize engaging staff collectively in developing a shared vision, identifying systemic problems, collective learning, and collective problem solving.

Beginning in the 1990s, educators borrowed and adapted the principles of sociocultural learning theory, such as the idea that individual development originates in social settings and learning organizations contribute to the school setting (John-Steiner & Mahn, 1996). The adoption was influenced by the work of Rosenholtz (1991) on the work setting in schools, Hargreaves’s (1994) work on school culture and reform, and Darling-Hammond’s (1996) and Little’s (1993) work on professional development. Hord (1997) collected and summarized the research and writing on the work of collaborative teams of educators into an expansive literature review using the term Professional Learning Communities to describe collaborative teams of teachers. Whether the collaborative team is defined as a learning organization or professional learning community, the concept offered the opportunity for sustainable school improvement over the long term.
Defining PLCs

For this study it was important to understand the multiple definitions of a PLC in order to completely understand the experiences of PLC members. McLaughlin and Talbert (2006, p. 5) wrote, “Learning communities provide opportunities for reflection and problem-solving that allow teachers to construct knowledge based on what they know about their students’ learning and evidence of their progress.” Hargreaves and Fullan (2012) defined the PLC by looking at the name “professional learning community” in a fashion that examines the differences in how the groups function based on the focus and nature of the work:

1. **Communities** – Where educators work in continuing groups and relationships (not merely transient teams), where they are committed to and have collective responsibility for a common educational purpose, where they are committed to improving their practice in relation to that purpose, and where they are committed to respecting and caring for each other’s’ lives and dignity as professionals and as people.

2. **Learning communities** – Where improvement is driven by the commitment to improving students’ learning, well-being, and achievement; where the process of improvement is heavily informed by professional learning and inquiry into students’ learning and into effective principles of teaching and learning in general; and where any problems are addressed through organizational learning in which everyone in the organization learns their way out of problems instead of jumping for off-the-shelf, quick-fix solutions.

3. **Professional learning communities** – Where collaborative improvements and decisions are informed by but not dependent on scientific and statistical evidence,
where they are guided by experienced collective judgment, and where they are pushed forward by grown-up, challenging conversations about effective and ineffective practice (p. 128).

The PLC model is based upon multiple conceptual frameworks. The frameworks provide the foundation for collaborative work in schools and have a direct influence on the ultimate level of success of a PLC. The frameworks are grounded in the sociocultural learning theory tenets of constructing new knowledge based on prior knowledge and experiences, making sense of information, and social interactions (Vygotsky, 1978; Wenger, 1998). Hord (1997) drew upon her work with the Southwest Educational Development Laboratory as inspiration for the development of her framework. The framework emerged from a thorough literature review on the work of learning organizations and PLCs and features five attributes:

1. Supportive and shared leadership
2. Collective creativity
3. Shared values and vision
4. Supportive conditions
5. Shared personal practice

The five attributes in the Hord framework encapsulate many of the important themes of school improvement (Hord & Hirsh, 2009). However, to implement the framework, the school leadership must be willing to share leadership decision-making to support both the collaborative culture and structure that PLCs require. The framework guides schools in the development of a shared vision focused on student learning. Most importantly, the professionals in the school must commit to collaborative learning in which reflection and
discussion about professional practice and student data leads to improvement in curriculum, assessment, and instruction. Analysis of student data provides direction to the collective learning.

**PLC as Site and Source of Learning**

The work of a PLC requires the members of the PLC to work collectively to seek and find appropriate answers for their specific context. Student achievement data provides teachers with knowledge of what resources or technical capacity are needed to advance student learning. The PLC is the “site and source” of professional inquiry when teachers become active learners through the process of collective inquiry (McLaughlin & Talbert, 2006, p. 6). However, in order for the PLC to be the site and source of professional inquiry, the teachers in the PLC must have the collective capacity to actively engage in the process of inquiry and deliberation. They must also have the collective capacity to determine problems of practice based on the evidence of learning provided by students.

Little (2003) discussed the challenges of specifically examining teacher learning within teachers’ daily interactions. Her findings highlighted the difficulty teachers experience in sustained work on instructional problems and possibilities, even when structures such as PLCs are in place to support that work. One reason for this difficulty is what she described as the teachers’ “horizon of observation” (Little, 2003, p. 917). Several factors, such as a teacher’s years of experience, the structure of time available for collaboration, the degree of isolation a teacher experiences, etc. contribute to a limited horizon of observation. Little’s work used teacher groups with a clear collective identity and a clear task orientation to examine accounts of classroom events and dilemmas that mostly occur outside of the classroom as part of natural workplace interactions. Her findings
indicate that teacher learning communities have the potential to facilitate teacher learning and improve teacher practice because teachers are able to learn from one another as they construct meaning from classroom experience.

Collaborative learning within a PLC has the potential to change the way that teachers experience professional development and expand the horizon of observation from that of the individual teacher to that of the collaborative team. Situating professional development within the PLC offers the possibility of making professional development more meaningful and valuable to teachers compared to traditional methods, because the PLC allows the learning to be focused on the particular context of the teachers in the PLC. Schools working to build new cultures of evidence and inquiry in teacher education through the PLC process have the potential to be transformed and revitalized, if the schools are able to shift the culture from isolation and teaching to collaboration and learning (Cochran-Smith & Boston College Evidence Team, 2009; Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009).

Research on teacher professional development suggests that there is a gap between what is demanded of teachers and what teachers are actually able to quickly implement (Elmore, 2003, 2007b). Implementation takes time and practice. While acknowledging the widening gap between knowledge and skill in teachers, research points to the need to transition the delivery of professional development from the workshop or in-service model to a model that involves learning every day and continuous collective improvement (Fullan, 2007; Horn, 2010; Little, 1993). Compared to other nations, teachers in the United States spend a similar amount of time in workshop professional development events. However, teachers in the United States spend much less time learning and planning together in collaborative settings in comparison to teachers in other nations (Darling-Hammond et al.,
McLaughlin and Talbert (2006) found in their study of effective PLCs that the most effective learning activities for teachers are those activities that:

a) focus on instruction and student learning specific to the settings in which they teach
b) are sustained and continuous, rather than episodic
c) provide opportunities for teachers to collaborate with colleagues inside and outside of the school
d) reflect teachers’ influence about what and how they learn
e) help teachers develop theoretical understandings of the skills and knowledge they need to learn (p. 8)

The learning activities in effective PLCs are related to student achievement. Goddard, Goddard, and Tschannen-Moran (2007) examined the results of PLCs on student achievement and found that after controlling for student characteristics and school contextual characteristics, teacher collaboration was positively related to student achievement in both math and reading at the elementary level (p. 891). Moller et al. found similar results in their study focusing on achievement gaps linked to student socio-economic status (Moller et al., 2013). Research shows strong connections between student achievement gains and effective peer interaction, particularly for new teachers or for teachers who are the weakest of their peer group (Jackson & Bruegmann, 2009; Marsh et al., 2015).

Instead of focusing on the student outcomes of PLC work, Kazemi and Franke (2004) examined teacher workgroups’ discussion around student mathematical understanding. The workgroups used student work as a way to build shared meaning and to provide insight on classroom practices. The authors argued that the artifacts led to the development of common language around their understanding of student work and student thinking within the
workgroup. However, this shared meaning was not developed simply by looking at student data. The fact that the teachers were able to speak to how the work was created and the context around the creation led to the generation of shared meaning. The generation of shared meaning relates directly to the epistemological stance toward student data of the PLC. The individuals made their stance toward student work explicit through conversation.

**Inquiry as Stance**

Cochran-Smith and Lytle (1999) described inquiry as stance as the “positions teachers and others who work together in inquiry communities take toward knowledge and its relationships to practice” (1999, p. 288). The authors distinguished inquiry as stance from the more general notion of inquiry that takes place in a time-bound activity such as a professional development session. An essential component of Cochran-Smith and Lytle’s conceptualization of inquiry as stance is the fact that an inquiry stance is both social and political in that “it involves making problematic the current arrangements of schooling, the ways knowledge is constructed, evaluated, and used; and teachers’ individual and collective roles in bringing about change” (1999, p. 289).

Inquiry as stance generates knowledge when teachers view their classroom as a site of investigation and also view the knowledge produced by other teachers as material for questioning and generating interpretation. Wells (1999) described knowledge generated through inquiry as the use of and production of representations of practice in order to collaboratively understand and transform shared work. The conception of inquiry as stance does not rely on teachers developing knowledge that is already known – by researchers or by expert teachers. Instead, over the course of a career, the teacher investigates their own
knowledge and practices as well as the knowledge and practice of colleagues. Therefore, their stance toward knowledge evolves over the course of their career.

The concept of inquiry as stance emerged from Wenger’s (Lave & Wenger, 1991; Wenger, 1998) sociocultural learning work on community of practice. Wells (1999) expanded on the idea of community of practice into what he termed a community of inquiry. Wells argued that communities of inquiry experience communal meaning-making through their use of language and other signs. The individuals in a PLC and the PLC collectively define their stance toward inquiry through their conversations as well as their interaction with evidence of student learning and other artifacts.

Nelson and colleagues (2012) examined inquiry as stance through teachers’ interactions within PLCs around student-learning data, specifically looking at the epistemological stance that teachers take toward student-learning data and the dialogic stance teachers take in the data process. The study found that the use of student learning data drove the collaboration of a teacher group. The interactions around data establish and refine the inquiry stance of the PLC. The study also found that the teachers’ beliefs and perspectives about student-learning data played a significant role in influencing the interactions within a PLC. While this study put the PLC in the foreground, if the belief of teachers about data influences the work of the PLC, it becomes important to study how individual teacher beliefs influence the work of the PLC. It is also important to investigate the ways in which the collaborative work of the PLC influences the individual teacher beliefs.

**Collaborative Inquiry**

In order for a PLC to become the site and source of professional development that will result in improved instructional practice and improved student learning, the work of the
PLC must engage in an ongoing process of collaborative inquiry (McLaughlin & Talbert, 2006). Collaborative inquiry is defined as the collective engagement of teachers in the process of “examining evidence of specific student understanding in order to inform practice” (Nelson et al., 2012, p. 15). Collaborative inquiry allows PLC members to learn from one another’s strengths, thereby building a shared repertoire of ideas, practices, and experiences that are used to understand new situations and guide new practice (Lieberman & Miller, 2008). Horn and Little (2009) wrote that classroom issues often have a level of complexity that makes solutions appear ambiguous to the individual teacher. However, when teachers share these classroom issues with peers, the PLC can collaboratively coordinate strategies to solve problems of practice. Collaborative coordination assumes that all members of the PLC are willing and able to engage in sharing of experiences and pursuing answers through inquiry. Therefore, each individual’s inquiry stance influences the collaborative work. Horn and Little explained how collaboration not only supports the construction of meaning, but also supports future collaboration through strengthening professional relationships:

When speakers and listeners are mutually engaged in the construction of meaning, different kinds of meanings converge, creating coherence and insight. On the surface, it is easy to see how coherence and insight have cognitive implications, but they have emotional ones as well. Coherence and insight via conversation create an experience of connectedness and a metamessage of rapport between communicators (p. 230).

The prerequisite of mutual engagement leads to a danger that even with the necessary structures in place for collaborative inquiry, teachers will be either unwilling or unable to have honest and disclosing discussions of classroom practice and student learning (Horn &
When teachers share their accounts of their classroom practice in a PLC meeting, their description often lacks detail in comparison to an account from a colleague who observed the classroom. Additionally, teachers’ accounts of classroom practice rely on shorthand terms, and fail to elaborate on context. Classroom accounts are often partial and selective in detail, often highlighting or exaggerating positive aspects of the work while diminishing or excluding negative experiences (Little, 2003). While researchers agree that collaboration is a powerful experience for teachers, if accounts of practice are partial, selective, or lack transparency, the collaboration might lead to work that is not effective in helping teachers meet the needs of students (McLaughlin & Talbert, 2006). Without focus on student learning and alignment to the school’s mission, vision, and values, collaboration becomes loose and inward-looking (Hargreaves & Fullan, 2012).

In the face of these challenges, what structures are necessary for a PLC to authentically foster collaborative inquiry? Lieberman and Miller (2008) wrote that collaborative inquiry is reliant on context, commitments, capacity, content, and response to challenges. The context in which the PLC exists – the culture of learning – will be discussed later in this chapter. Commitment takes time. Teachers need time and support to build trust and learn how to “talk, think, and view their collaborative work” (p. 38). The capacity of the PLC members to engage in collaborative inquiry grows as teachers’ commitments to one another develop. Once teachers begin to talk together honestly and begin to engage in knowledge work both as producers and consumers of new ideas, they begin to make connections to their classroom practices. Content is important, but content knowledge must be balanced with knowledge of pedagogy. Finally, it is important to remember that
challenges are endemic to any social enterprise. The PLC draws in the strength of the mission, vision, and values in challenging times.

As the teachers in a school develop into a collaborative team, they begin to construct knowledge of content and pedagogy (Lieberman & Miller, 2008). The teachers begin this process through all aspects of conversation. “Making sense of one another’s stories, speculations, explanations, comments, jokes, complaints, and observations - treating them as situationally meaningful and adequate for some purpose - is a central and constitutive feature of teachers’ collective practice” (Little, 2003, p. 936). Teachers’ representation of their practice allows the other members of the PLC to contextualize their work into the foundation of the team’s collective inquiry. The representation of practice must include both success and failure. When teachers study the gap between standards established for learning and what students actually achieve, they become motivated to change their practice (McLaughlin & Talbert, 2006).

The development of collaborative teams requires a school culture and environment that supports collaboration. Hargreaves and Fullan (2012, p. 137) describe a successful process for building PLCs with a focus on collaborative inquiry:

a) Teachers are pulled into something they find energizing, that they are given time for, and that respects their collective (not individual) professional autonomy and discretion; yet they are also pushed to review or revise what has been more or less effective for them, and to acquire practices from other colleagues who may be doing some things better.
b) PLCs have a clear focus, but this is collectively and flexibly determined by the community – not administratively imposed on everyone, in a standardized way, from outside.

c) There is a sense of urgency about challenging teachers’ practice, yet also a patient realization that the essential trust and relationships that underpin PLCs can only develop over time.

d) The leadership is firm and persistent enough to challenge his teachers and leaders with frankness, yet humble and open enough to know when he has to pull back because he has gone too far and shoved too hard.

Collaborative inquiry therefore requires a school context that supports the teams’ autonomy, flexibility, and time to develop inquiry processes within a PLC. However, the PLC also needs to remain focused and persistent in their work.

**Inquiry Based Data Processes**

The phenomenon of data-driven decision making and data-driven instruction has become pervasive in schools, and educators are expected to use multiple sources of data in collaborative work on student learning (Bocala & Boudett, 2015; Coburn & Turner, 2012; Datnow & Hubbard, 2015). The definition of data in the context of a PLC is “information that is systematically collected and organized to represent some aspect of schooling” (Schildkamp & Poortman, 2015, p. 2). The data used for decision making can range from indicators such as scores on state and national assessments to informal formative assessments to school attendance. Assessment of student learning is an area of instructional practice that has been the focus of a significant amount of attention (DuFour et al., 2008; DuFour et al., 2010; Elmore, 2003, 2007b; Hord, 1997; Popham, 2011; Stiggins, 2002). Of particular
importance to this study is how teachers in PLCs use and interpret student data to make adjustments to instructional practices. However, the ways in which teachers actually interact and use data to inform decision making remains an area in need of further research (Coburn & Turner, 2012).

Coburn and Turner (2012) provided an overview of research on data use, arguing that many approaches fail to address teachers’ actual issues of practice. The authors cited research that examined the relationship between initiatives to promote data use and standardized test scores and suggested that without knowing how the teachers actually interacted with the data, we learn little about how to design data practices that increase their effect. A second line of research examined activities and structures to promote data use. But without attention being paid to how teachers engage in the data use intervention, the research failed to provide insight into why the interventions have positive results in some schools and not others. Coburn and Turner suggested that research is needed that investigates “what actually happens when people engage with data in the course of their ongoing everyday work and how that relates to instructional change and organizational learning” (2003, p. 101). Therefore, it is important that inquiry stance of teachers toward data be examined further to determine how individual teachers experience data exploration, collection, analysis, and determine data implications through collaboration.

Several researchers have worked to address the limitations noted by Coburn and Turner by focusing on the practice of data use within the collaborative work of teachers (Datnow, Park, & Kennedy-Lewis, 2013). Expanding on their research from 2003, Coburn and colleagues (2009) conducted a qualitative study that suggested that decision making based on data in schools is centered around interpretation and persuasion, both of which are
shaped by contextual working knowledge of the teachers. The fact that the study found that “the meaning and implications of evidence is not self-evident” is important to future research, including this study, on how teachers make meaning from data, because if implications are not self-evident, the stance of teachers toward the data will be a significant factor in making meaning from the data (Coburn et al., 2009, p. 1143).

According to Popham (2011), successful PLCs build a process for the creation and analysis of formative assessment data to examine ways to improve instructional practices. Using the evidence from formative assessments within a PLC is linked to the collective inquiry process and is the bridge between the learning and planning in the PLC and classroom instructional practice. When the formative assessment is developed collaboratively, the assessment provides context and a basis of comparison for the PLC when examining the resulting evidence. The examination of evidence of success provides a compelling reason to examine instructional practices (Elmore, 2007b). The formative assessments developed by the PLC reflect the epistemological stance of the PLC toward student data in what they decide to measure and how they decide to measure it.

One approach to examining the ways that teachers in a PLC interact and interpret data is to focus on the processes PLCs use around data. Nelson and colleagues (2012) defined the nature of data processes, which includes exploration of possible data sources, collection of student data, analysis, and implications for future practice. The exploration phase involves work related to potential assessments of student learning. During this phase, teachers discuss connections between a potential assessment and learning targets or specific instructional practices. Data collection involves the development and implementation of specific data collection tools. The data analysis phase happens when teachers are working to make
meaning from student responses. The authors found that this phase had two categories: looking at student work for specific ways of thinking or trends, and determining meaning or purpose of the assessment item. The implications phase involves using the data analysis to either make changes to classroom practices and learning goals or confirm that there will not be changes to classroom practices and learning goals.

Each of these phases involves a degree of inquiry on the part of the teachers in the PLC. Teachers must make decisions either based on what they have learned from past experience or pursue new learning to make a change in practice. While these practices are common to PLC work, research has found that the process of collection and making meaning of student data is often problematic because teachers often feel that they possess the requisite knowledge to ensure validity in their interpretation of data (Nelson, Slavit, Perkins, & Hathorn, 2008).

**Leadership**

Effective leadership from both administrators and teachers is a crucial component of successful implementation of PLC data processes and the long-term sustainability of PLCs (Dufour & Marzano, 2011; Kanold, 2011; Marzano, Waters, & McNulty, 2005; Robinson, 2011). A PLC relies on leadership from both within the community through distributed teacher leadership, and from outside of the community through support from school and district administrators. The distribution of leadership and the ways that ownership of the work of the PLC are shared or not shared influence the group stance toward inquiry and data (Nelson et al., 2012).

School and district leaders establish the vision and structure that allow PLCs to develop (Tschannen-Moran, 2009). In an extensive review of leadership research, Bolman
and Deal (2013) made five propositions about leadership within the context of an organization that align with the type of leadership structure required to support the work of PLCs:

a) Leadership is an activity, not a position

b) Leadership is different from management

c) Leadership is multilateral, not unilateral

d) Leadership is distributed rather than concentrated at the top

e) Leadership is contextual and situated not in the leader but in the exchange between leader and constituents (pp. 344-346).

By summarizing and synthesizing decades of research on leadership, Bolman and Deal found that while no one characteristic of leadership was universal, several characteristics appeared frequently. Effective leaders are able to clearly articulate a vision, are passionate and determined, care deeply about the work, and inspire trust through relationship building. The authors consider relationship building to be a crucial component of team building, and they encourage team leadership with “soul” (Bolman & Deal, 2013, p. 284). Teams function at high levels when there is a shared faith in the team and a shared organizational culture. For PLCs to function at high levels, relationships need to be nurtured among the teachers.

Boleman and Deal suggested that in order to nurture the relationships among teachers, school leaders should view the school through multiple frames. The authors used structural, human resource, political, and symbolic frames to help leaders understand the multiple perspectives humans have toward their work. The use of frameworks to better understand multiple perspectives helps school leaders identify, understand, and solve challenges that arise through the implementation and on-going support of collaborative work.
**Principal as Instructional Leader**

The leadership qualities identified by Bolman and Deal align with the concept of the school leader being an instructional leader. Collaboration and collective inquiry are supported in schools where the leadership takes on the role of instructional leader as opposed to viewing leadership as a managerial task (Blase & Blase, 1999). The concept of an instructional leader includes five primary tasks: assistance to teachers, group development, staff development, curriculum development, and action research (Leithwood, Seashore Louis, Anderson, & Wahlstrom, 2004). Through these tasks instructional leaders encourage collaboration and reflection on practice and openly discuss instructional practice.

Blasé and Blasé (1999) found through research on teachers’ views of principals that the view of the principal as an instructional leader was connected to how teachers view the principal’s support of collaborative networks that encourage the study of instructional practice. The teachers in their study indicated that successful principals modeled teamwork, provided time for collaboration, and encouraged teachers to investigate successful practices. The instructional leaders encouraged teachers to visit other teachers’ classrooms or even encouraged visits to other successful schools. Similarly, Youngs and King (2002) found that effective principals are able to establish trust and build structures that support teacher learning either through connecting to external expertise or through generating reforms and innovation from within the school.

Effective principals set a clear course with high expectations for student learning that are guided by data, develop and support the teachers in the organization, and make the organization work by ensuring that the school conditions support learning (Leithwood et al., 2004). School administrators must be clear that an administrator’s areas of focus are student
learning, building leadership capacity in order to disperse leadership, and to bring coherence to the school through structures and culture (DuFour et al., 2008). PLCs incorporate all three areas of focus. Research shows that a PLC integrates individual teachers’ vertical expertise (individual knowledge and skills) with a horizontal expertise (knowledge that is created through collaboration) (Marsh & Farrell, 2015). This research suggested that school leaders consider both the vertical and the horizontal facets when coaching with or building a PLC. The research also supports the need for structured time for rich discussion when responding to student learning data.

School leaders can put in place organizational routines that provide structure for teachers to work collaboratively by framing and focusing interactions among teachers (Jimerson & Wayman, 2015). However, simply putting in place a routine without clarity of purpose may lead to teachers simply going through the motions in order to be compliant with expectations, in essence following the script without changing practice. In order for the structures and routines to be effective, there needs to be learning and understanding as to why the routine has been implemented. The effectiveness of a structure or routine is the “interplay between individual agency and the structure of the routine” (Sherer & Spillane, 2011, p. 646). Organizational routines need to be examined from design, implementation, and institutionalization, in order to balance the interplay between individual agency and the structure used for the routine. By looking at the routine over time, researchers can determine how practice emerges. School leaders cannot design practice – how teachers actually perform the routine. Leaders must instead plan for practice (Spillane, 2012). Therefore, school leaders should consider a plan for implementation when designing structures or routines.
Leadership from teachers and administrators is especially important when new PLCs are formed. Nelson (2009) studied the implementation and effectiveness of secondary math and science PLCs and found that teachers working collaboratively to interpret students’ responses and building a shared understanding of the state’s expectations opened opportunities for voicing and negotiating teachers’ own expectations for student work. Unpacking standards language and analyzing their students’ work while collectively incorporating new teaching strategies raised new questions for the PLC members about learners and learning. However, support from administrators and teacher leaders is critical to move teachers past problematic areas such as developing the trust needed to share student work or the willingness to question instructional decisions and classroom practices. Administrative support for PLCs includes guiding the PLC toward self-governance, making data accessible, providing access to research, and providing time for collaboration (Hord & Hirsh, 2009). PLC members appreciate administrators who support the collaborative work, which results in teachers who are collaborative, self-directed, inquiry-minded, and empowered by their work. Administrator support of collaborative work toward the school’s vision, rather than perceived direction to complete specific tasks, gives the PLC members a sense of autonomy in their work (Linder, Post, & Calabrese, 2012).

An important component of PLC leadership is the establishment of a learning culture within the school. Schein (2010) wrote about three levels of the culture of an organization. Artifacts, defined as the sensory phenomena, make up the first level of culture. The second level of culture contains the stated beliefs and values of the organization. This level of culture contains the mission, vision, values, and ideas that the organization claims. The third level of culture is made up of the basic underlying assumptions of the organization, the
beliefs and values that are taken for granted and often determine behavior and perception. There is alignment among these three levels of culture and the definitions of a PLC and the role of leadership in a PLC already discussed in this literature review. The first level of culture aligns with the structures that must be in place for PLCs to function at a high level, such as common time to meet. The second level of culture aligns with the need for shared mission, vision, and values of the school. Finally, the third level of culture aligns with assumptions about the profession of teaching, such as isolation, and assumptions about students, such as the bell curve distribution. School leadership must be aware of all three levels of culture and work to shape the school culture into a culture of learning.

Level one of a PLC culture is easier to build and sustain than levels two or three. Changing the structure of the school to provide more time for collaborative work will not lead to effective collaboration unless a culture of collaboration is built (Fullan, 2007). McLaughlin and Talbert’s (2006) findings were similar to the findings of Fullan and suggested the following process for changing the professional culture:

a) A teacher community of practice develops through joint work on instruction, usually starting with a focus on one facet of instruction – subject content, students, or assessment of student learning

b) Teacher learning in a community depends upon how well the joint work is designed and guided, or the extent to which an effective learning environment is created for the teachers

c) Teacher learning and community development spread, and sustenance depends upon proactive administrator support and broad teacher leadership (McLaughlin & Talbert, 2006, p. 39).
The cultural change to a lifelong commitment to professional learning is much more difficult to implement than structural changes. The leadership challenge, therefore, is to understand that structures are not enough to develop and sustain collaboration. Leaders must understand the perspectives of the individuals within their organization. This understanding can be grounded in the human resource, political, and symbolic frames of Bolman and Deal, the multiple perspectives of knowledge and practice of Cochran-Smith and Lytle, Schein’s perspective on culture, or combinations of the perspectives presented in this chapter (Bolman & Deal, 2013; Cochran-Smith & Lytle, 1999; Schein, 2010). Leaders can use this understanding to build a collaborative learning culture in which leadership responsibilities are distributed throughout the organization and teachers feel empowered and effective.

Researchers have also examined how district-level environmental or structural contexts influence educators’ use of data. Much of this work is grounded in the communities of practice literature and the epistemology of practice literature (Cook & Brown, 1999; Wenger, 1998). Coburn (2009) found that the multiple levels in the structure of most districts’ leadership leads to diverse and at times conflicting ideas about practice. Additionally, resource constraints can make it difficult for new practices to develop. The authors also found that data use is influenced by political factors such as the organizational structure and leadership, because while data is often cited as a way to avoid politicized decisions, decision makers can use certain data to add legitimacy for their position. This finding is backed up by Simmons (2012), who wrote that researchers need to bring awareness to the role of politics in determining the ideologies that are used to convert data into educational policy. It is therefore important to examine how teachers make decisions about student data and how teachers approach collaborative analysis of student data.
Distributed Leadership

Administrators leading PLCs must ensure that the needs of the school for structure, support, and accountability do not conflict with the needs of teachers and others in the school for the freedom to allow data and learning to dictate the direction of inquiry of the PLCs (Costa, 2013; Cranston, 2009; DuFour, 2012; DuFour et al., 2008; DuFour et al., 2010; Dufour & Marzano, 2011; Kanold, 2011). While the principal may take the lead at first by structuring the schedule or arranging meetings, over time the team members take on the leadership roles. Feelings of professionalism among teachers are boosted when they have a sense of self-governance. To have a staff that learns together and makes decisions as a team requires administrators who can let go of their sense of “omnipotence and omnicompetence” and share leadership with the teachers (Hord & Hirsh, 2009, p. 17).

Distributed leadership occurs when the leadership activities of a school are shared across individuals and roles across the organization (Louis, Mayrowetz, Smiley, & Murphy, 2009; Spillane, Halverson, & Diamond, 2001). As leadership is distributed, teachers must conceptualize their role as one that exists beyond the classroom and as a part of the whole-school improvement efforts. Kennedy and colleagues (A. Kennedy, Deuel, Nelson, & Slavit, 2011) found three important attributes of schools with distributed leadership: The schools recognize and take advantage of experience and expertise of staff members, the schools have a process for differentiated top-down decision making and lateral decision making, and the distributed leadership culture is supported through collaborative work. These attributes result in a school with a flattened hierarchy in which decision making is shared with knowledgeable individuals (Spillane, Halverson, & Diamond, 2004).
When leadership is distributed through the members of PLCs, teachers are able to build their individual and collective capacity (Bezzina, 2006; Clark et al., 1996; Hargreaves & Fullan, 2012; Hord & Hirsh, 2009; Neuman, 2000). Individuals and PLCs build capacity in many facets of the work, including approaches to data, approaches to instruction, approaches to curriculum, and approaches to collaboration. Distributed leadership allows the entire organization to assume responsibility for student learning (Lieberman & Miller, 2008). The degree to which leadership is distributed might constrain individual members of the PLC if the collaborative structures developed by the PLC are too tightly linked to standardized expectations or external control. As teachers in a PLC take on an inquiry stance, they challenge structures and underlying assumptions of current practice (Cochran-Smith & Lytle, 1999). However, a balance must be found between too much structure and too little structure within the PLC process. Datnow (2011) found that PLCs need a supportive culture and supportive structures for effective collaboration. However, they also need to be able to make decisions and pursue inquiry based on their collaboration. Bezzina (2006) concluded that sustaining the improvements brought about through participation in PLCs required the leadership capability of many in the organization. If a PLC was without a strong sense of shared leadership, the learning of the PLC was slow or insignificant.

Collaborative professional learning that is focused on building goals as well as teaching and learning builds individual and collective capacity in teachers (King, 2004). Lambert (2005) defines teacher leadership capacity as an organizational concept in which teachers throughout the organization achieve school improvement through the work of leadership. PLCs offer a structure for broad-based participation in the work that leads to school improvement. Through increased teacher leadership capacity, the leadership of the
school improvement work is distributed to teachers in PLCs rather than concentrated in the principal or building leader. Spillane, Halverson, and Diamond (2004) examined leadership in schools as opposed to specific leaders. The researchers looked at how micro leadership tasks combine to support macro leadership tasks such as establishing a culture of collaboration.

An important aspect of PLC leadership is the ability to build trust among the members of the PLC. Hallam et al. (2015) examined benevolence, honesty, openness, reliability, and competence in a case study and found that of these five facets, development of trust was related primarily to benevolence, openness, and reliability. The authors suggested that principals and teacher leaders should avoid top-down micromanagement in order to build trust among members of the PLC. The authors also suggested that principals and teacher leaders should be inclusive in the decision-making process for the school, especially in terms of adding new members to the PLC.

The tradition of teacher isolation makes it difficult to establish a school’s learning culture that embraces risk taking and encourages teachers to learn and grow from failure. Teachers may avoid taking the risks involved in exposing or changing their practice when they fear negative evaluations, either formal evaluations by an administrator or informal evaluation from peers. The principal then must work to shift the culture such that the entire school takes professional responsibility for instructional quality rather than the individual teacher (Hargreaves & Fullan, 2012, p. 127).

Risk taking is not encouraged in schools where bureaucratic structures are emphasized over the cultivation of teacher professionalism (Ingram, Seashore Louis, & Schroeder, 2004; Tschannen-Moran, 2009). Bureaucratic organizations have a rigid
adherence to rules and policies with little discretion left to teachers. Such organizations often implement processes designed to closely monitor teachers. Teacher professionalism is related to both the professional orientation of school leaders and the degree to which faculty trust their principals, colleagues, parents, and students. Characteristics of a professional orientation include a belief on the part of school leaders and teachers that members of the profession have expert knowledge and have a primary concern for student learning and welfare (Tschannen-Moran, 2001, 2009). This belief is implemented through the cultivation of trust, the creation of conditions in which teachers used professional judgement in decision-making, and the establishment of professional norms in the school (Tschannen-Moran, 2009).

In addition to learning to embrace risk-taking, PLC members must learn how to deal with the disagreements that naturally arise within the group. Disagreement is common in a PLC because professional practice is always up for discussion and because questioning, disagreement, and discussion lead to areas of inquiry. Therefore, if the PLC is able to keep the focus of the work on student learning, disagreements can transition to positive outcomes (Hargreaves & Fullan, 2012). Inquiry is supported when teachers are given the time and the opportunity to be exposed to new ideas, discuss the idea, incorporate the idea into their practice, and discuss the success of the idea in practice (Elmore, 2000).

**Efficacy**

The professional behaviors in collaborative inquiry and inquiry based data processes have been found to be sources of teachers’ sense of self-efficacy and collective efficacy (S. Y. Kennedy & Smith, 2013; Lee, Zhang, & Yin, 2011). Research on teachers’ experience on self-efficacy and collective efficacy is grounded in the work of Bandura (1993, 1995, 1997). Efficacy is defined as “…beliefs in one’s capabilities to organize and execute the courses of
action required to manage prospective situations” (Bandura, 1995, p. 2). These beliefs manifest in efforts to achieve goals and positive results as well as efforts to avoid negative experiences. Bandura (1995) wrote that there are four primary ways in which beliefs about efficacy are formed: mastery experiences, vicarious experiences, social persuasion, and a teacher’s psychological and emotional states. Mastery experiences are experiences where success is achieved. Vicarious experiences are experiences where an individual sees another individual similar to themselves succeed through perseverance. Social persuasion occurs when an individual is told by another that they have what it takes to succeed. Finally, an individual’s psychological and emotional state, such as experiencing stress, influences the sense of efficacy. Studies have connected collaboration in the PLC process with improvement of teachers’ experience of efficacy on instructional strategies (Lee et al., 2011).

Teacher efficacy describes a teacher’s belief that they will be able to accomplish a specific teaching task in a specific context (Bandura, 1997). Tschannen-Moran, Woolfolk Hoy, and Hoy (1998) found that as teachers experience success, increased beliefs of efficacy form. The increased sense of efficacy causes teachers to put forth more effort and to stay engaged in difficult tasks, which often results in more successful experiences. However, they also found the opposite to be true. Experience of failure leads to a decreased sense of efficacy which perpetuates unsuccessful experiences.

Goddard, Hoy, and Hoy (2000) expanded on the concept of teacher efficacy to examine how teachers perceive the collective teacher efficacy of a school’s faculty. The authors wrote that collective efficacy is composed of an analysis of a teaching task and an assessment of teaching competence. The analysis of the teaching task involves taking into account what the teachers in a school will need to do to be successful. This analysis includes
looking at the context of the school to identify what supports and barriers exist. The assessment of teaching competence includes examining the content knowledge, pedagogical knowledge, and faculty beliefs.

Kennedy and Smith (2013) looked at how the collaborative reflective practices of PLC work influence teacher self-efficacy and collective efficacy. They found that if PLC work is approached with teacher learning in mind, the collective efficacy of the school increased and the individual teacher efficacy increased as well. For example, goal setting is linked to the appraisal of ability, whether individual goal setting or collaborative goal setting. A sense of efficacy also influences the degree to which people feel they can control their environment, which includes their work within the PLC. The most important factor in increased efficacy through PLC work was collective reflective practice. The research concluded that schools that support more collective reflective practice have teachers that demonstrate the least amount of negative emotional response to student-learning data, administrative observations, or peer observations.

Summary

The literature and research that currently exists on PLC concepts and frameworks describe significant opportunities for structuring schools and improving student learning through teacher collaboration. However, while the literature provides a great deal of insight on how PLCs can and should be structured, such as the make-up of teams, time to meet, agendas, norms, etc., the day-to-day experiences of PLC members is an area in need of further study. In particular, further study is needed to understand how PLC members approach student data and how PLC members use student data as a source of inquiry.
This case study adds to the understanding of how teachers experience their PLC as a site and source of their professional inquiry and how student-learning data is used to provide direction to inquiry. This research foregrounds the individual teacher experience in PLC work and examines how teachers perceive their personal stance toward inquiry interacting with the PLC’s collective stance toward inquiry. This study also adds to the literature base on how the school context both supports and constrains the work of the PLCs in the school and the ways in which teachers experience collaboration.
CHAPTER 3. METHODOLOGY

The context of this case study was the work of high school teachers within a Professional Learning Community in a school in which efforts by a new administrative team were under way to revitalize existing PLC processes. The overall purpose of this case study was to understand how individual PLC members experience their inquiry stance toward student learning data through collaborative work in a PLC. The conception of inquiry as stance indicates that teachers generate knowledge when they view their classroom as a site of investigation and also view the knowledge produced by other teachers as material for questioning and generating interpretation (Cochran-Smith & Lytle, 1999). This case study investigated how members of a PLC make meaning of their personal inquiry stance toward student data, how members of a PLC interpret the influence of their personal inquiry stance on the stance of their PLC, and how members of a PLC interpret how external factors impact the PLC’s stance toward student data. To understand participants’ interpretation of their inquiry stance, a framework was used to examine both participants’ epistemological and dialogic stance toward student-learning data (Nelson et al., 2012). The epistemological stance examines the ways that teachers link the data process to a vision of content and learning goals, the ways that teachers link the data process to instructional practices, and the ways that teachers link the data process to student understanding. The dialogic stance examines the dialogic interactions of members of the PLC as they engage in the data process. The dialogic interactions surface differences of perspective among members of the PLC. The investigation of these differences creates opportunities for collaborative learning.
The case study allowed for a deeper understanding of the individual teacher experience of the professional learning community model, specifically in terms of the relationship between student data and professional stance toward inquiry.

A basic interpretive approach was used for this research, which allowed for examination of how PLC members interpret their experiences as well as how they create or construct meaning and knowledge through their interactions within the PLC (Merriam, 2002; Neuman, 2000). This chapter provides a description of the methodological framework that guided this study, the methods used for the study, and descriptions of the research site, participants, and processes for data analysis. The chapter also includes discussion of ethical considerations, the role of the researcher, and reflexivity.

**The Qualitative Approach**

A qualitative approach to research provides the opportunity to develop a deep understanding of complex issues by talking directly with individuals and asking them to share their stories (Creswell, 2014). While there has been a considerable amount of research focused on the conceptualization and measurement of teachers’ collegial interaction, and in specifying the attributes of professional communities, relatively little research examines the specific interactions by which a professional community constitutes a resource for teacher learning and practice (Little, 2003). Nelson, Slavit, and Deuel (2012) wrote about two dimensions of an inquiry stance towards student data in PLCs. In their conceptualization, they identified the PLC rather than the individual teacher as the unit of analysis to capture the epistemological and dialogic aspects of collaborative inquiry. They wrote that it was not a question of choosing between the individual and the group, but of foregrounding a particular unit of analysis. Their framework focuses on the interactions of the community by
conceptualizing and searching for evidence of stance in the interactions that define the meaning-making activity. The choice of the community focus limits the analysis of the individuals’ perspectives in order to foreground the interactions that define the teacher talk within a collaborative group.

This study, in contrast, used the framework developed by Nelson and colleagues as a basis to examine how individual teachers make meaning from their participation in the PLC. Nelson and colleagues suggested that more research is necessary into the connections between an individual’s stance to the stance of the overall group. This study examined how teachers experience the influence of their own inquiry stance on their colleagues in a PLC as well as how the individual teachers experience the influence of their colleagues’ inquiry stance on their own stance. By foregrounding the individual experience and meaning making, this study provides insight into the “black box” of interaction in a collaborative inquiry group with a specific focus on the study of student learning data (Little, 2003, p. 915).

For this study, the researcher examined the experiences of high school teachers in a mid-sized high school organized into PLCs by asking the following questions:

1. How do individual teachers make meaning of the epistemological and dialogic aspects of their PLC’s inquiry stance toward student data?
2. How do teachers interpret the influence of their personal inquiry stance toward student data on the stance of their PLC?
3. How do teachers interpret the influence of external supports and constraints on their PLC’s inquiry stance toward student data?
An essential characteristic of qualitative research is that the research seeks to generate understanding of the meaning that participants construct from their experiences (Creswell, 2013; Merriam, 2002). Little (2003) wrote that PLCs offer an “optimistic premise” in that “conditions for improving teaching and learning are strengthened when teachers collectively question ineffective teaching routines, examine new conceptions of teaching and learning, find generative means to acknowledge and respond to difference and conflict, and engage actively in supporting one another’s professional growth” (p. 913). This study investigated the optimistic premise of the PLC by focusing on the stance toward student data that educators take as they actively engage in collaborative inquiry as well as the structures and supports needed to encourage and sustain that work.

The qualitative research design of this study was guided by four elements of epistemology, theoretical perspective, methodology, and methods (Crotty, 1998). This chapter will show how each of these elements relates to the study.

**Epistemology**

The development of the research design begins with discussion of what types of knowledge are possible. This study used social constructivism as an epistemological framework. The social constructivist framework states that individuals seek to make meaning from their world and build subjective meaning through their experiences (Crotty, 1998). The framework also allows the researcher to investigate the context in which people work to understand the historical and cultural context (Creswell, 2014). The social constructivist framework allows for researchers to move beyond the theory and structure of PLC implementation and focus on how teachers construct meaning from working with student data through the PLC process. Lieberman and Miller warned that some proponents
of PLCs are, “so invested in the success of the enterprise that they gloss over the inevitable tensions and challenges that arise; they sweep them under the proverbial rug” (2008, p. 31). Using the epistemological framework of social constructivism to examine the meaning that teachers generate from the PLC process of student data analysis will pull back that proverbial rug to allow for deeper understanding of the experiences of teachers working in PLCs.

This research study was based on the interpretations of the meaning generated by teachers who were engaged in professional growth and development through interaction in PLCs. The participants in this study all interacted with student data as a component of participation in a PLC, but each individual had an interpretation of the meaning of his or her individual experience and stance toward student data as well as how that stance contributed to the experiences of other members of the PLC.

**Theoretical Perspective**

The framework for analysis in this study was based on the interpretive theoretical perspective. This perspective allowed for the examination of how individuals interact and experience their social setting as well as the meaning it had for them (Crotty, 1998; Merriam, 2002). The focus of this study was how teachers interpret their stance toward student data and how their stance impacts their work both within the PLC and from an instructional perspective in the classroom.

Little (2003) described the potential for instructional practices and student achievement to improve when teachers work collectively to question instructional practices and student understanding, build relationships that allow for productive response to conflict, and actively support collective learning and development. Nelson, Slavit, and Deuel (2012) examined PLC’s stance toward student data through a conceptual framework that examines
the epistemological and the dialogic aspects of the PLC work. This study investigated the optimistic premise of the PLC by focusing on the experiences of educators as they engaged in collaborative work examining student data as well as the influence of external supports and constraints on the inquiry stance toward student data.

The interpretive theoretical framework allowed for meaning to be developed through teachers’ reflection on their interactions with PLC members and an examination of the context of the PLC rather than using a preconceived theory to explain the experience. Thus, an interpretivist perspective was used to develop an understanding of the PLC phenomena whereas a positivist perspective would focus on causality (Crotty, 1998; Schwandt, 2000).

The conceptual framework for this study was Cochran-Smith and Lytle’s (1999) conception of inquiry as stance. The term stance refers to the positions that teachers take toward knowledge and how knowledge relates to practice. This framework does not use a formal knowledge – practical knowledge distinction, nor does it bound inquiry by time or project. Instead, teacher knowledge is informed through forming and reforming understandings of student learning and the contexts in which teachers work. The concept of inquiry as stance is intended to capture how teachers learn from their practice and how they engage in an inquiry process to interpret their practice (Cochran-Smith & Lytle, 1999).

The inquiry as stance framework is based in teachers’ work in inquiry communities. An important aspect of an inquiry community is the nature of the discourse among teachers. Through discourse the teachers make their knowledge visible to one another and engage in collaborative analysis and interpretation. The inquiry as stance framework acknowledges the issues of power and decision making related to the designing and implementing the direction of learning for the community. Cochran-Smith and Lytle (1999) suggested that the issues of
power and decision making are always present in a PLC. The way that these issues emerge from the PLC work and how the issues are dealt with determine how productive the PLC will be over time.

The two-dimensional conception of an inquiry stance toward student learning data developed by Nelson and colleagues provided a framework for this study on the inquiry stance that members of a PLC take toward student data (2012). The two-dimensional framework was used by Nelson and colleagues to examine PLCs’ stance toward inquiry during conversation in PLC meetings, examining the PLC as a collective entity. For this study, their framework was used instead to examine the inquiry stance that individual teachers brought to their PLC.

The first dimension of the framework is the epistemological stance toward student learning data. The epistemological stance is the set of beliefs that impact the approach, actions, and decisions around student data. The epistemological stance determines the way that teachers view learning goals, the use of teacher content knowledge, and how data is used to understand student learning and teacher practice (Nelson et al., 2012). The framework utilizes a continuum from a proving stance to an improving stance to analyze the epistemological stance. A teacher with a proving stance tends to generalize individual student data in order to make broader claims about the entire class. The proving stance also tends to look at the effectiveness of past instructional practice rather than examining ways to improve future practice. A teacher with an improving stance tends to carefully examine individual student data to look for problems of instructional practice that offer opportunities for improvement. Interview questions were designed using the components of the two-
dimensional framework to attempt to uncover both the stance of the interviewee, and the interviewee’s interpretation of the stance of their PLC.

The second dimension of the conceptual framework examines the dialogic approach toward student data. This dimension considers the ways in which teachers talk about student data. The authors hypothesize that attention to the nature of interactions about data can help PLC members strengthen their inquiry stance and develop new understandings about instructional practice (Nelson et al., 2012). Similar to the epistemological dimension, the dialogic dimension plots teacher dialogue on a continuum. At one end of the continuum is disconnected talk that does not involve negotiation. At the other end is inquiry-based talk that includes sustained negotiation. Negotiation is defined as dialogue in which conflicts arise and are willingly explored. These conflicts create the opportunity for inquiry and teacher learning. Therefore, disconnected talk avoids conflict while inquiry-based talk seeks to learn from conflict.

The Two Dimensions of an Inquiry Stance Toward Student-Learning Data framework guided the choice of methods for data collection and the analysis of data in this study (Nelson et al., 2012). In order to determine the inquiry stance of individual members of a PLC, it was necessary to conduct individual interviews as the primary means of data collection, and the interview questions were designed to align with the framework. The Two Dimensions Framework then provided the lens for data analysis. All data was compared to the framework in order to determine the individual stance of the participants as well as the participants’ perceptions of the stance of their PLC.
Methodology

The methodology for this study was based in qualitative phenomenological case study research (Flyvbjerg, 2006). Experts disagree as to whether a qualitative case study is in fact a methodology or rather the method used to research using a methodology such as phenomenology. Crotty (1998) and Stake (1995) view qualitative case study as a method or decision as to what will be studied. Creswell (2013), however, views the case study as a methodology, “a type of design in qualitative research that may be an object of study as well as a product of the inquiry” (p. 97). This study treated qualitative case study as the method and phenomenology as the guiding methodology. Yin (2009) wrote that “case studies are the preferred strategy when ‘how’ or ‘why’ questions are being posed, when the investigator has little control over events, and when the focus is on a contemporary phenomenon within some real-life context” (p. 1). This study aligned with Yin’s suggestion. The context of this study was teachers’ professional collaboration in PLCs and how teachers experience an individual and collaborative stance toward inquiry. The study investigated how teachers experienced a contemporary phenomenon in which the investigator had no control over the events.

The phenomenon under analysis in this study was the inquiry stance toward student data that teachers experienced through participation in a Professional Learning Community. All qualitative research is based on how people experience a phenomenon. A phenomenology seeks to gain understanding about the essence or structure of a phenomenon (Merriam, 2002). The goal of this study was to explain the rich reality of the dialogic and epistemological aspects of a PLC’s inquiry stance toward student data, how teachers interpret the influence of their personal inquiry stance on the stance of the PLC, and how the teacher interprets the influence of external factors on their PLC’s inquiry stance toward student data.
This case study was bound by the specific circumstances of the research site. The site was a suburban Midwestern high school that organized teachers into PLCs beginning in the 2011-2012 school year. This specific case is important for research because the school had a completely new administrative team for the 2016-2017 school year. The new administrative team was engaged in work to revitalize the PLC process. This case examined teachers’ experiences of PLCs in a setting where the building leadership worked to support aspects of the PLC process that were perceived as successful as well as working to implement changes to improve practice.

The concept of a PLC and the potential for what a PLC structure can do for teaching and learning in a school is well established in the literature (DuFour et al., 2008; Hargreaves & Fullan, 2012; Lieberman & Miller, 2008; McLaughlin & Talbert, 2006). This study, however, examined aspects of the phenomenon of the inquiry stance that the PLC concept fails to express (Crotty, 1998).

The method of studying the phenomenon of the PLC was a hermeneutical phenomenology which examined the lived experience and the texts of life (Creswell, 2013). Hermeneutic phenomenology seeks to reflect on experiences in language and interpretive devices that make analysis and description intelligible (Van Manen, 2014). The meaning derived from a social organization such as a PLC cannot be separated from the lived experience of the participants in the PLC. A phenomenological case study of PLCs asked the researcher to set aside previous understandings and attempt to see the PLC in the “immediate experience” of the teachers and to draw new meanings from that experience (Crotty, 1998, p. 78). The research site for this study provided an intriguing opportunity to examine the
immediate experience of teachers in a PLC because the school was revising existing PLC work.

Data was collected through individual teacher interviews, which were digitally recorded and transcribed into verbatim accounts using the transcription service rev.com. The participants were interviewed in two sessions, each about 45 minutes in length. The two 45-minute sessions allowed the length of the session to be manageable for the teacher and allowed for time between sessions. The semi-structured interview questions used in this study aligned with the research questions (See Table 1). A question such as “How do you experience the relationship between student learning data and instructional practices” aligns with the Two Dimensions framework as well as the research question about the participant’s interpretation of their inquiry stance. The semi-structured nature of the protocol allowed the researcher to follow up on participant responses. All data from the interview transcriptions was coded for emerging themes. Coding involved analyzing the collected data and segmenting the data into categories. Once the data was segmented, a term describing the segment was assigned (Creswell, 2014).

**Pilot Study**

The researcher completed a pilot study as a component of the course of study for the graduate program. The pilot study allowed for the development and refinement of research questions as well as the development and refinement of data collection processes (Creswell, 2014). The purpose of the pilot study was to assist a school district in analyzing the components of successful PLCs as experienced by teachers and administrators. The pilot study used a qualitative approach that included four participants who took part in one-hour interviews.
The pilot study asked participants to describe administrative actions that support PLCs, how teachers experienced their PLC as a site and source of professional development, and how teachers interpreted changes in student achievement as a result of their participation in PLCs. The experience of the pilot project resulted in the researcher narrowing the focus of study for the dissertation as well as establishing a conceptual framework to guide the study. While the pilot study attempted to examine all aspects of teachers’ and administrators’ experience with PLCs, the researcher decided to focus on teachers’ interpretation of inquiry stance for the dissertation. The Two Dimensions of an Inquiry Stance developed by Nelson and colleagues provided both a focus and a framework for the dissertation (Nelson et al., 2012).

The change in focus and the use of the framework resulted in changes to the research questions. The research questions for the pilot study asked participants to reflect on structures and supports in the PLC process that led to success as measured by student achievement. The research questions for the dissertation did not presuppose success in the PLC process. The dissertation research questions also focus on participants’ experience of their personal inquiry stance and how they experience the interplay of their personal stance and the stance of their PLC.

The interview protocol was developed based on the process described by Creswell (2013, pp. 163-166). The research questions guided the development of interview questions (Appendix A). Questions were designed to gather information about individual teachers’ approach to student learning data, how individual teachers interpret their personal stance toward student data in the context of collaboration with the PLC, and how individual teachers interpret the supports and constraints that impact the PLC’s inquiry stance toward data.
Table 1

Research Questions in Relation to Interview Questions

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Interview Question</th>
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<tbody>
<tr>
<td>How do individual teachers make meaning of the epistemological and dialogic aspects of their PLC’s inquiry stance toward student data?</td>
<td>C1, C2, C3, C4, C5, C6, C10, E6, F2, F3, F4, F5, F7, F8</td>
</tr>
<tr>
<td>How do teachers interpret the influence of their personal inquiry stance toward student data on the stance of their PLC?</td>
<td>B1, B2, B3, B4, B5, B6, B7, B8, C7, C8, C9, F1, F6, F9, F10</td>
</tr>
<tr>
<td>How do teachers interpret the impact of external supports and constraints on their PLC’s inquiry stance toward student data?</td>
<td>D1, D2, D3, E1, E2, E3, E4, E5, E7, E8, E9, G1, G2</td>
</tr>
</tbody>
</table>

In addition to changes in the research questions, the interview protocol evolved from the pilot study to the dissertation. The researcher found that interviews during the pilot study often lasted longer than the hour scheduled. For the dissertation research the interview protocol was designed around two 45-minute sessions. The interview questions were modified to reflect the focus on inquiry stance for the dissertation. However, questions that elicited responses that pertained to inquiry stance in the pilot study were retained for the dissertation project.

The pilot study was a case study and included analysis of PLC documents. The protocol for document analysis in the pilot study informed the document analysis protocol for the dissertation project. The documents were used to corroborate and augment interview and observational data (Yin, 2009). The documents were coded using the same techniques as the interview transcripts. The pilot study did not use PLC observation to collect data. However, the experience of the pilot study led to the decision to include observation of PLC meetings.
for the dissertation project in an effort to gain context during the interview process and the analysis of interview transcripts.

**Research Site and Selection**

The school in which this study took place was a mid-size, Midwestern public high school, one of nearly three hundred school districts in the state. While the high school was in a mid-size district, it had experienced steady enrollment growth over the past decade. The rate of growth in student population led to a number of teachers new to the district each year. The high school that was studied had over three hundred students and over thirty certified teachers.

The school that was studied began to formally group teachers into PLCs at the beginning of the 2011-2012 school year. However, during the 2016-2017 school year, a new administrative team as well as other personnel changes resulted in changes to the expectations for PLC work and the ways that PLC work was supported in the school. These changes offered a unique opportunity to examine teachers’ experiences at the beginning of a new PLC process in a setting where many teachers have previous experience in PLCs with the same colleagues. The changes in administration, teaching staff, and processes could possibly mean that there would be some resistance to PLCs due to teachers’ concerns about change. Fullan (2007) wrote that all change involves some degree of loss and anxiety, and the failure to be aware of these phenomena has led to aspects of change being ignored or misrepresented. However, the changes in the make-up of the teaching and administrative staff might also provide for a setting in which there is optimism about the possibility for PLC work to improve collaboration and to improve instructional practice. The fact that the school was at the beginning of a new PLC process provided an opportunity to examine teachers’
inquiry stance toward student data in a unique way that might not be possible in a school that has used the PLC process for an extended period of time, as it might become difficult for experienced PLC members to separate their own stance from that of their PLC. The setting also provided a unique opportunity to examine the experience of teachers as new processes are implemented to support PLC work, when the majority of the staff has not only previous PLC experience, but previous PLC experience with predominantly the same colleagues. The research site also offered a unique opportunity to examine how the individual inquiry stances of the PLC begin to be renegotiated by the PLC members as the practices of the PLC evolve and the supports of the PLC work evolve.

**Participants**

The educators selected for this study were selected through purposive sampling, also known as purposeful selection (Maxwell, 2012). In phenomenological case studies all participants must have experience of the phenomenon (Creswell, 2013). The criterion for selection was participation in one or more of the PLCs in the high school setting. Since the goal of this study was to understand teachers’ experiences of professional learning and collective inquiry as a part of the PLC, their experience with administrator and teacher leadership within the PLC, and their interpretation of how their professional learning and collective inquiry impacts classroom practice and student achievement, teachers from across content areas were included in the interviews and observations (Vagle, 2014). The research included a wide range of experience levels of teachers in terms of the length and breadth of their teaching career as well as in terms of the length and breadth of their experience as a member of a PLC, as well as a wide range of tenure in the school in an effort to gain insight into the broadest range of experiences possible within the setting. Creswell (2013) suggested
a sample size of three to ten subjects for phenomenological studies. This study involved eight interview participants who agreed to participate after receiving a request. Each interview participant was interviewed twice over the course of the spring semester of the 2016-2017 school year. The interview sessions were spread out by several weeks so that the researcher could gather participant experiences over time. A total of fifteen teachers across three different subject-level PLCs were observed over the course of the semester. The PLCs observed included the teachers who were interviewed. This purposeful selection gave the researcher access to the information needed to answer the research questions (Maxwell, 2012). The researcher reached a level of data saturation with the participants in the study (Creswell, 2013, 2014). By the end of the second semester of the 2016-2017 school year and the second round of interviews new data did not generate new categories or themes.

**Data Collection Methods**

This phenomenological case study involved the gathering of multiple sources of data. Through the process of gathering multiple sources of data and using the process of triangulation to analyze the data, the researcher is able to balance strengths and weaknesses of data points, lending validity to the analysis (Creswell, 2013; Maxwell, 2012; Stake, 1995; Vagle, 2014). Using extensive interview data along with observational data and document analysis allowed the researcher to provide a much richer description of the phenomenon compared to what would be possible using a single source of data. It was essential that the researcher keep an open mind to the possibilities of data sources throughout the course of the research (Vagle, 2014).

In this study, protocols were established for each component of the data collection process. The protocols for interviews, observations, and document analysis were derived
from the research questions and based on theoretical frameworks presented in the literature, particularly the concept of collaborative inquiry (Little, 2003). Fieldwork procedures followed guidelines regarding access to the site and access to participants (Maxwell, 2012; Yin, 2009).

**Interviews.** The research questions of how teachers interpret their inquiry stance toward student data led to using interviews as a significant source of data. The interview offers “a window on the past” as the subjects recount their experience of events (Weiss, 1995, p. 1). Interviews provided detailed descriptions of participants’ experiences with student data as well as rich descriptions of the process their PLC takes toward student data.

It was necessary to build a rapport with the interview participants so that they were comfortable to speak openly and honestly. The nature of the interview, however, sets up an unequal balance of power between the interviewer and the interviewee (Kvale & Brinkmann, 2009). The power imbalance was addressed by allowing the interview participants to read and respond to both the interview transcript and the analysis.

The interviews in this study were semi-structured to allow for variances in experience to emerge. The interview questions were written to focus on both the phenomenon of the PLC as well as the research questions (Vagle, 2014). Qualitative dissertations on PLC work were used to help in the development of the interview questions (Bergevin, 2006; Stollar, 2014; Zito, 2011). Conducting semi-structured interviews required the researcher to be able to make methodological decisions during the interview to conceptually ground the questions in the PLC framework and the research questions (Kvale & Brinkmann, 2009). Grounding the questions in the PLC framework allowed the researcher to stay focused on data gathering and the written account (Stake, 1995).
A consistent interview protocol was used to set up interviews, conduct interviews, and process interviews. Consistency in following the protocol ensured fidelity and validity for the study. All participants were invited via email to participate in the study and informed of the potential risks involved in participation. When teachers responded to the email request for participation, a meeting was scheduled for the interview. One-on-one semi-structured interviews took place at the participant’s school or at an off-site location such as a public library. The interviews took place in two sessions, with two to three weeks separating each session. Each interview session lasted approximately 45 minutes. After each interview, the audio recording of the interview was transcribed within 48 hours of the actual interview. A transcription service, rev.com was used, however the transcript was compared with the audio recording by the researcher to ensure accuracy of the transcript.

After the transcription was completed, the interview subject was given the opportunity to review the transcript and clarify if necessary. The majority of the participants responded that the transcript accurately captured their comments. However, some editing was needed on two of the transcripts where the recording quality was not as high as the other recordings. In these cases, the researcher had not accurately captured some acronyms used for PLC processes and student assessments in the district. The transcripts were corrected, and the participants were able to once again review the transcript and ensure accuracy.

**PLC Meeting Observations.** The researcher observed PLC meetings of three different participating PLCs over the course of the second semester of the 2016-2017 school year. The PLCs observed included the participants who were also interviewed for the study. A consistent observation protocol was used to arrange observations, conduct observations, and process the field notes from observations. In the same way consistency ensured fidelity
to the research questions in the interview protocol, consistency ensured fidelity and validity in the observation protocol. Participant PLCs were invited to participate in the study and informed of the potential risks involved in participation. When teachers responded indicating they were willing to participate in the study, a time was scheduled for the observation. Observations took place in the school setting in the PLC’s regular meeting room.

Field notes were collected of observations of conversations about student data. The researcher assumed the role of nonparticipant observer, meaning that the researcher was an outsider from the PLC (Creswell, 2013). While the PLCs tended to sit at desks organized into a circle, the researcher sat off to the side of the circle while observing and taking notes. Observational field notes used a protocol (Creswell, 2014) in which a header provided a description of the session, such as “Biology PLC February 12, 2017 – 45 minutes”. The page was divided in half vertically with the left side of the page for descriptive notes and the right side of the page for reflective notes. During the observations, the researcher attempted to document the meeting as objectively as possible. Once the meeting was over, the researcher reflected on the observation using the Two Dimensions Framework developed by Nelson and colleagues (2012).

Each observation lasted approximately 45 minutes. The researcher wrote field notes during the observation. Analysis of the field notes took place within 48 hours of the observation. A copy of the field notes document was not provided to the PLC for review. However, the researcher communicated with members of the PLC after the observation to ask clarifying questions if context was not clear during the observation. For example, during one of the observations the PLC referenced a building-wide professional development session that had recently taken place. Because all of the PLC members had been present and
participated in the professional development session, their conversation did not make the context, the format, or the objective of the session obvious to the researcher. A follow-up email clarified the session for the researcher.

**Documents.** The researcher collected PLC documents from participating PLC members. Specifically, PLC meeting agendas and notes as well as documents containing data analysis procedures or protocols were collected. These documents were used to corroborate and augment interview and observational data (Yin, 2009). Examples of the documents that were collected included meeting agendas, minutes from meetings, data analysis documents, collective commitments, and examples of collective professional learning. Data from documents were coded for emerging themes.

**Data Analysis**

Interviews were transcribed by the researcher using the transcription service rev.com, and the transcriptions were analyzed through the process of coding through a combination of emerging and predetermined codes (Creswell, 2013, 2014). The conceptual framework of the Two Dimensions of an Inquiry Stance Toward Student Learning Data predetermined some codes (Nelson et al., 2012). However, codes were also allowed to “emerge” from the data during the analysis (Creswell, 2013, p. 185). PLC documents were examined to determine alignment with the participants’ responses to interview questions about their PLCs (Yin, 2009). While both the interviews and the document analysis were coded and categorically aggregated, data was also directly interpreted if the researcher determined it to be the most appropriate approach to analysis (Stake, 1995). Through this method of data collection and analysis a detailed description of the phenomenon emerged.
Qualitative data analysis required the researcher to evaluate each instance by analyzing component parts as well as synthesizing the data to generate meaning (Stake, 1995). In the same way that the data collection methods for this study were chosen based on the research questions, the methods of data analysis aligned with the research questions. Therefore, data analysis was an ongoing process along with data collection as part of a systematic plan of making meaning from the data (Maxwell, 2012). Phenomenological research also required the researcher to epoche or bracket his preconceived thoughts, understandings, and opinions of the phenomenon in order to approach the phenomenon “as we experience it and free ourselves from presuppositions” (Van Manen, 2014, p. 220).

Interview recordings were transcribed as soon as possible after the interview so that a memo could be prepared as a general overview of information. The transcript was shared with the participant to allow them to confirm the transcription. Next, a detailed analysis included coding and categorization. Coding and categorization allowed themes to emerge from the data. A narrative was generated from the emerging themes, and finally meaning was interpreted (Creswell, 2014).

**Ethics**

This study complied with institutional ethical standards in conducting research. The Iowa State University Institutional Review Board (IRB) provided consent for the study before any data were collected. The IRB approval memo is included in Appendix E. Measures to ensure the strictest ethical standards included voluntary participation from subjects with the option to opt out of the study at any time, as well as strict confidentiality measures, including the use of pseudonyms. Data were encrypted and stored on a password-
protected ISUBox storage system. Access to conduct research at the school required a request form to be submitted to district-level administration.

The IRB documentation indicated that participants would complete an Informed Consent Document. The Informed Consent Document articulated the potential ethical concerns that might arise through participation in this project as well as the safeguards designed to mitigate the concerns. Participants signed the Informed Consent Document and retained a copy for their records prior to their participation in the project.

The research questions that guided this study required participants to provide answers that had the potential to describe negative professional experiences, including negative collaborative and social situations. Pseudonyms were used for all participants in the study as well as the name of the school that served as the site of research. If a name was used in an answer to an interview question, a pseudonym was used for that name as well. If a description of a colleague was included in the answer to an interview question, the specific description was not used in the study.

**Trustworthiness**

Validity in a qualitative study according to Maxwell (2012) refers to “the correctness or credibility of a description, conclusion, explanation, interpretation, or other sort of account” (p. 122). In order to achieve the maximum level of correctness and credibility it was important to both identify potential bias in the researcher or threats to the research methodology and to document the processes and strategies that were used to guard against bias.

Yin (2009) suggested four tests of validity for case studies as well as tactics for dealing with issues of validity. Construct validity involves identifying operation measures.
Tactics for construct validity include using multiple data sources, establishing a chain of evidence, and having subjects review drafts of conclusions. Internal validity issues arise when a study seeks to find causal relationships. While this study does not set out to determine causality, it is important to be aware of and address rival explanations. External validity defines the domain to which a study can be generalized. Finally, reliability shows that the operations of a study can be replicated with the same results (pp. 45-47).

This study involved intensive involvement over the course of time so as to gain as complete of a picture of the teachers’ experiences of the PLC as possible. Research was conducted beginning in January of 2017 and continued through the end of May 2017. This timeframe allowed for multiple interview and observation sessions. Maxwell (2012) suggests that observations and interviews that take place over a period of time help to avoid premature theories. The prolonged time spent at the setting helped the researcher develop a more complete and detailed explanation of the setting (Creswell, 2014). The extended time and multiple visits allowed for multiple pieces of evidence, which Yin (2009) describes as a tactic for increasing construct validity.

The interviews were recorded, and a verbatim transcription was made of each interview. The teacher then had the opportunity to review the major findings and themes taken from the interview. Allowing the participant to review the interview transcript and findings will rule out the possible of misinterpretation (Maxwell, 2012).

Triangulation was used to analyze themes from the perspective of different sources of data (Creswell, 2013). Two specific types of triangulation were used in this study. Data Source Triangulation required the researcher to determine if the data stays consistent over time, in different settings, etc. Methodological triangulation allows the researcher to use
multiple data points, such as document analysis, in addition to the interview data (Stake, 1995).

Reflexivity is the critical self-reflection the researcher practices in order to identify and deal with issues that might impact the outcome of the study, such as assumptions, biases, and relationships to the study (Creswell, 2013). It was important that the researcher was aware of his role as a school administrator with significant experience working with PLCs. It was critically important that the researcher bracket his own experiences in order to focus on the experiences of the participants in the study. The researcher must remain open to the experiences of the participants while collecting research. The review of transcripts and themes by the participants also helped to ensure that the researcher’s personal experience did not cloud data collection or analysis. This reflexivity influenced the way that the researcher positioned himself as an interviewer and observer throughout the data collection process and data analysis process.

**Researcher Positionality**

The principal instrument of data collection and analysis in a qualitative case study is the researcher (Stake, 1995). It is therefore important that all personal biases and opinions of the researcher be considered at each point in the research process. This includes an acknowledgement of the researcher’s involvement in the context of the study.

My desire to answer the research questions stems from my experience in PLCs, both as a teacher participant and as an administrator participant. My experiences in PLCs aligned with the “optimistic premise” of the benefits of professional collaboration (Little, 2003, p. 913). However, my experiences in PLCs have not aligned with the ideals described by DuFour and colleagues (DuFour et al., 2008; DuFour et al., 2010). Throughout the process
of developing the research proposal, conducting the interviews and observations, analyzing the results, and writing this dissertation, I have been intentional in my reflection on my personal experience with PLCs as I have learned from the individual experiences of the participants in this study. As I reflected on my PLC experiences and examined the participant responses, I continued to come back to the reason that I decided to focus my research on PLCs: the idea of teachers experiencing their work through professional collaboration in which they are empowered to investigate aspects of their practice and pursue inquiry to generate new knowledge is incredibly enticing due to the “optimistic premise” of PLCs.

Limitations and Delimitations

A limitation of this study was that the research site was limited to one suburban Midwestern high school. While the study included participants from multiple content areas and multiple PLCs, the data ultimately emerged from a single school. Therefore, while the study will add to the understanding of teacher inquiry stance toward student data, care must be taken if the results are to be generalized to other contexts.

A second limitation in this study was the researcher’s lack of a prior connection to or professional relationship with the potential participants. While the researcher worked to develop trust and rapport, the lack of a relationship possibly influenced a subject’s willingness to participate or his or her responses once they choose to participate in the case study.

Summary

In spite of the noted imitations, this study provides valuable insight about how teachers interpret their personal inquiry stance toward student data, how that stance impacts
their collaborative work, and how that stance is impacted by external supports and constraints. The study will lead to a better understanding of how student learning goals are constructed, the conceptualization of what constitutes student learning data, and how these data are used to inform instruction. Finally, the study will develop understanding on how teachers make meaning of the data process in collaborative work.
CHAPTER 4. RESEARCH FINDINGS

The purpose of this phenomenological case study was to gain understanding about how individual teachers experience and interpret the stance toward inquiry of their PLC. The study asked participants to interpret the beliefs and approaches to the process of inquiry of their PLC and how the PLC’s beliefs and approaches to inquiry were articulated through dialogue within the PLC. Participants were asked to describe their personal stance toward inquiry and the interaction of their personal stance with the collaborative stance of their PLC. Additionally, participants were asked to describe their experience of supports and constraints to inquiry through their participation in PLCs.

The high school studied was organized into PLCs during the 2011-2012 school year. However, the school had new administration for the 2016-2017 school year who engaged the teachers in efforts to strengthen and support teacher collaboration in PLCs. This case, therefore, provided a unique opportunity to study teachers’ interpretation of stance as they reflected on past experiences and contemplated future collaboration under new administration. This research adds to the understanding of the role of stance toward inquiry in PLCs and how teacher collaboration might be fostered and supported. Chapter Four describes the themes that emerged from analyzing data generated through in-depth interviews, observations of PLC meetings, and PLC documents.

Participants

This study collected data through in-depth interviews, PLC meeting observations, and PLC document analysis. Eight teachers participated in the interview process. Each teacher participated in two interview sessions over the course of a semester, and each interview lasted approximately 45 minutes. An additional seven teachers agreed to be observed in four
different PLC meetings but elected not to be interviewed. The interview participants ranged in teaching experience from three years to thirty years. Educational experience spanned from bachelor’s degree to master’s degree with over thirty credit hours beyond the master’s. Participants were members of the English Language Arts PLC, the Music PLC, the Science PLC, the Math PLC, and the Special Programs PLC.

Table 2 provides a summary of participant teaching experience at the research site (Elberon High School is a pseudonym, as are all names). The interview participants included three males and five females.

Table 2

Summary of Participant Experience at Elberon High School

<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Experience at Elberon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mary</td>
<td>F</td>
<td>11 years</td>
</tr>
<tr>
<td>Patricia</td>
<td>F</td>
<td>1 year</td>
</tr>
<tr>
<td>Elizabeth</td>
<td>F</td>
<td>3 years</td>
</tr>
<tr>
<td>Linda</td>
<td>F</td>
<td>6 years</td>
</tr>
<tr>
<td>James</td>
<td>M</td>
<td>4 years</td>
</tr>
<tr>
<td>John</td>
<td>M</td>
<td>17 years</td>
</tr>
<tr>
<td>Barbara</td>
<td>F</td>
<td>3 years</td>
</tr>
<tr>
<td>Robert</td>
<td>M</td>
<td>6 years</td>
</tr>
</tbody>
</table>
Research Questions

This study focused on the lived experience of high school teachers who are members of PLCs and their perception of their inquiry stance toward student data. The study was based on the following research questions:

1. How do individual teachers make meaning of the epistemological and dialogic aspects of their PLC’s inquiry stance toward student data?
2. How do teachers interpret the influence of their personal inquiry stance toward student data on the stance of their PLC?
3. How do teachers interpret the influence of external supports and constraints on their PLC’s inquiry stance toward student data?

Data Collection

A qualitative phenomenological case study approach provided insight into the meaning generated through the experience of PLC participation. Data was collected through individual interviews conducted over the course of the spring semester at the participants’ school. A semi-structured interview protocol allowed for rich conversations to develop between the participant and the researcher. Interview transcripts generated over 240 pages of single-spaced text for analysis. The interview protocol is delineated in Appendix A. In addition to individual interviews, the researcher observed three different PLCs in meetings over the course of the second semester of the 2016-2017 school year, taking 36 pages of notes using the observation notes protocol in Appendix C. In addition, PLC documents such as agendas, discussion protocols, and curriculum planning documents provided additional data (18 pages).
Data Analysis

The process for analyzing the data relied on the strategy of following the theoretical propositions that led to the case study (Yin, 2009). The Two Dimensions of an Inquiry Stance Toward Student-Learning Data framework (Nelson et al., 2012) guided the development of the research questions and therefore the interview questions. The data were coded and analyzed first by research question and then by categories and subcategories guided by the conceptual framework described in Chapter 2 and Chapter 3. Following each interview session, the recording of the interview was transcribed using the service rev.com. The accuracy of the transcript was confirmed by the researcher listening to the audio recording of the interview while reading through the transcript. During observations of PLC meetings interspersed between interviews, the researcher took field notes using the protocol in Appendix C. Immediately after the meeting, the researcher reviewed the notes and wrote memos from the notes within the protocol. Documents were analyzed using the field notes protocol in Appendix C. Meaning was determined based on the comments made by participants about the document either in the interview setting or in the setting of the PLC meeting.

An analysis of all interviews and field notes led to the sorting and coding of categories. Some codes were a priori due to the use of the Two Dimensions of an Inquiry Stance Toward Student-Learning Data as a conceptual framework for the study (Nelson et al., 2012). Other codes emerged from repeated reading of transcripts, listening to audio recordings, and examination of field notes that allowed patterns to emerge, which led to the revision of initial categories and codes. The continuing analysis of categories, codes, and patterns allowed themes to be determined.
Research Question 1: Epistemological and Dialogic Stance of the PLC Toward Student Learning Data

Eight themes emerged through participants’ answers to questions about their interpretation of the epistemological and dialogic stance of their PLC toward student learning data. The eight emergent themes were:

1. A focus of PLC work was the discussion of student learning goals.
2. PLCs used student learning data to prove effectiveness of instruction.
3. PLCs used student learning data to analyze trends in student achievement.
4. The focus of PLC dialogue.
5. Use of data to support claims.
6. Teachers experienced the nature of questions in PLC dialogue to be procedural.
7. Teachers experienced the questioning of knowledge and beliefs in their PLC.
8. Teachers experienced social relationships among members of the PLC as congenial.

The epistemological stance toward inquiry of a PLC is determined by the beliefs that frame the approach to a set of activities and frame the actions within a set of activities (Nelson et al., 2012). In this study, participants were asked about their perceptions of the beliefs that frame the work of their PLC in general, and specifically, that frame their PLC’s approach to student data. Participants were asked about how they experience the ways in which the PLC data process is linked to a vision of content and learning goals, instructional practices, and student understanding, which are the components of the Epistemological Stance Toward Student-Learning Data in PLCs framework (Nelson et al., 2012).

**A focus of PLC work was the discussion of student learning goals.** During interviews, participants were asked to describe their perception of student learning goals and
how student learning goals are linked to broader subject matter concepts. The participants in this study described their PLC work as primarily focused on the development and clarification of content and learning goals, which the school-generated documents referred to as essential learnings. The essential learnings were prioritized course and content standards, and PLCs worked to align the essential learnings to the Common Core curriculum.

In response to a question about how his PLC discussed content and learning goals, John explained the type of conversations that he experienced in his math PLC about essential learning:

Well, for example, if we share the subject, we want to make sure that we are assessing the kids kind of at the same level. We do a whole lot of talking on essentials. You know, that's been the big focus this year is your essential learning. We are finding out what our essentials are and then everything else we teach. We've discussed what those [essentials] are. We discuss what's important that [the students] have to know from Algebra I before they go to Algebra II, and we really do a lot of work together on making sure that we are just really set to go forward.

John described the purpose of the PLC work on essential learning as a way of collaboratively identifying key concepts and ensuring that instruction and assessment were aligned with the key concepts. He explained that the PLC discussed the essential learnings at the course level and also that the PLC worked to connect key concepts from one course to the next.

John explained that in order to align the essential learnings to the Core Curriculum, the PLC discussed interpretations of the Common Core standards through the lens of their content area expertise as well as a belief that the textbook authors and publisher had done much of the work during the production of the textbook. John indicated that often the
Common Core standards aligned with the student learning goals that the PLC had developed on their own and had in place for several years. He also attributed his confidence in the alignment of the essential learnings determined by the PLC and the Common Core standards to the fact that the textbook publisher designed the text around the Common Core, and the PLC used the textbook to guide decisions about essential learnings.

While he expressed confidence in the alignment of the PLC-determined essential learnings and the Common Core standards, John described the work of writing and revising the wording of essential learnings and discussing the alignment of the essential learnings with the Common Core standards as the main focus of the PLC’s work. He expressed a concern that the PLC’s focus on the wording and format of essential learnings did not allow the PLC to have the time necessary to engage in other work, such as discussions on how to best support students who were not making adequate progress in their classes.

Elizabeth spoke to a similar process of discussing essential learnings in the English Language Arts PLC. She described time spent working to vertically articulate the essential learnings for each course from ninth grade to twelfth grade to look for overlapping standards or standards that were not sufficiently covered. She explained that thinking of the essentials vertically from ninth to twelfth grade drew the team members’ attention to the way that the students experience the curriculum over their high school career as opposed to a focus on a single course. Unlike John, Elizabeth explained what she felt was a need to revisit the team’s decisions over time, examining the way that the essential learning was worded each time to ensure that the PLC shared a common understanding of each standard:

We have spent time vertically planning and we have spent time again and again, not just once, again and again, going over standards and looking at them in different
formats [of the same language]. Not all of us have agreed about the way we've looked at them. That has been some culture building in our group. Sometimes it takes looking at the same [standard] 20 times and using different language every time for everybody to understand it.

In Elizabeth’s view, revisiting the essential learnings over time proved to be beneficial. She reported that the work resulted in the development of a common understanding of the vertically articulated curriculum for the teachers, and that developing language that made essential learnings clear and viable to all teachers and students was a goal of PLC work in the school. She indicated that common understanding made the standards clear and viable for the teachers, which would help to make the standards clear for the students as well. She also indicated that the work was not done, and the process of revising to clarify standards and to ensure their viability would be an ongoing process for the PLC.

While Elizabeth embraced on-going work to revise and refine essential learnings, Barbara described concern that rather than working toward clarity, the on-going revision made her PLC uncertain about day to day student learning goals. She spoke to the need for clarity in the linkages between sub-concepts within a big idea:

You need to figure out which [concepts] are essential and which ones are nonessential. Not nonessential, but not as important as the essential ones. I guess [the Common Core is] trying to point us in the right direction. Are we too specific? Are we not specific enough? Is this going to make sense? Are we going to be able to actually follow through on these? Those questions aren't really answerable all the time.
Barbara expressed frustration with her PLC’s focus on skills rather than connecting skills to larger concepts.

Robert’s science PLC approached the process of identifying essential learnings from the broad perspective of content-specific skills rather than course-specific content and skills. The science PLC began their work by asking questions about what types of skills and understandings were important in all science classes. They decided to start with interpretation of graphs because it was a standard that they previously taught and assessed in each of their science classes. The next step was to determine what components and degrees of understanding were important for students at each grade level. The team began this work by identifying what was essential for a student going into college and then worked back through each high school grade level. Finally, they applied the grade level essentials to course-specific content and skills. Robert explained that starting the discussion of essential learnings with large concepts that spanned multiple courses and then aligning specific skills for each course required all members of the PLC to explore the interrelationships of each course’s content to the larger concept, often making changes to past course content and instructional practices.

Linda’s language arts PLC used a similar process to what Robert described, starting with big concepts and aligning essential learnings to the large concept for each course. For example, elements of fiction was one of the Common Core standards, but the PLC felt the wording of the standard was too vague to have meaning for the team or for students. Like Robert’s team, the language arts PLC engaged in conversations about how to approach the standard vertically across grade levels. Linda developed a chart for the PLC to use to
graphically display where introduction, practice, and mastery would be at each grade level for the standard of elements of fiction.

While there was consensus among the participants about the importance of developing clear content and learning goals, there was not consensus in the way that PLCs used student learning data in the process of developing the content and learning goals. When asked about whether or not student learning data was used during conversations about essential learnings, Linda stated, “No, the essentials are not influenced by student data.” She went on to explain that in her view, the data analysis process is one that occurs after the essential learnings are in place and assessments have been developed around the essentials. James, however, indicated that his music PLC used student achievement data in conversations about essential learning. He recalled a PLC meeting in which there was a “Let’s just address the elephant in the room” conversation where the team decided that based on current achievement data, the essential learning goals needed to be clearer for both students and teachers. He explained that the lack of clarity about the learning goal resulted in varying methods of assessing students, which made it difficult for the PLC to compare and evaluate the student learning data.

While there was not consensus among participants in the use of student-learning data in the process of determining the essential learnings, there was consensus in the ways in which participants spoke about their perception that the collection of student learning data would be an important part of their ongoing PLC work. Several participants described a process of developing assessments based on established essential learning goals. Elizabeth described team conversations about her PLC’s decision to use a grammar assessment as a piece of evidence to bring to their PLC for data analysis work. She recalled that the team did
not “butt heads” with the essential learnings themselves. Instead, they disagreed about how to get students to the goal and how exactly to assess the student learning:

It's easier to gather data points for grammar. [Grammar instruction] happens more frequently. It takes less time instructionally in the classroom, but because we reached an impasse for a while, it took us all year to get to a place where we could at least agree, “Yes, let's do gradual release grammar.” [We decided] we'll return to the assessment piece later. Now it's later and we've gotten to a sticky point, and it's been common formative assessment. I can't even say that we all really understand common formative assessment. I know that some of us do. We understand what their purpose is within the PLC, and the irony to some degree is that we have been doing a kind of common formative assessment up until now. We've been doing what common formative assessments are for. We've been evaluating data and we've set up our assessments so that they were as common as possible given that we all taught different classes. We were already doing it. We're just giving it a name now.

The fact that Elizabeth described the decision to examine data on student understanding of grammar because of the perceived ease of gathering data supports the assertion that Elizabeth and her PLC viewed data analysis as an important part of PLC work. However, rather than using the data as a basis for inquiry around learning goals, instruction, and assessment, the PLC used the data process as a means to an end. They used the data process to prove that they developed common formative assessments and engaged in a data process because that is what their PLC was supposed to do.

Elizabeth stated that it took over a year to get to a place where the team agreed on the essential learnings for grammar. There was consensus from each of the participants that the
pace of the work on creating a vision of content and learning goals was too slow. Linda said, “So I feel like we got somewhere, but then, if you look at the Common Core, there’s another 87 standards to go…” She continued, “Each [standard] has been a hill to die on… It sometimes feels super tedious to me, the way you have to go through every individual thing. Last week we spent the whole time talking about one aspect of grammar.” In Linda’s view, these conversations led to the development of assessments that seemed contrived because each course and grade level were attempting to measure the same thing in isolation of the other course content.

My observations of PLC meetings aligned with the responses from the participant interviews. Much of the observed PLC discussion centered on writing and revising essential learnings, and particularly the way that the wording of the essential learnings would align with school expectations of clarity, viability, and alignment to the Common Core. The PLCs interacted with Google Docs provided to PLCs so that they could enter the results of their discussion into a chart of essential learnings. In several different meetings with different PLCs, time was spent sorting out confusion over which specific Google Doc the PLC was supposed to interact with that day. There were also conversations about the meaning of some of the vocabulary that was on the Google Docs, such as “readiness,” “endurance,” and “leverage.” When questions about the meaning of terms emerged, some PLC members searched for the definition in Google Docs provided to the PLC. Once the answer was found, it was read to the rest of the PLC. However, the definitions of terms did not appear to influence or change the direction the work of the PLCs. The interactions of PLC members left the impression that the identification of essential learnings was perceived as a task to complete rather than a process of inquiry.
PLCs used student learning data to prove the effectiveness of instructional practices. The second section of the Epistemological Stance Toward Student-Learning data in PLCs examines the links between the ways in which the collection and analysis of student learning data influences discussion and decisions about instructional practices. The framework places the use of student-learning data along a continuum from a proving stance to an improving stance based on the ways that data is used to generate questions and rethink practice. In PLCs with a proving stance, data is used to verify past practice and confirm pre-existing questions about student understanding. A PLC with an improving stance uses data to rethink and question past practice, and findings are used to guide inquiry about future practice (Nelson et al., 2012). Each of the participants in this study spoke about the data process of their PLC having at least some influence on instructional practices across the PLC. The participants were also able to describe an ideal state of PLC work in which the regular examination of student learning data would lead to improved instructional practice and improved student achievement. This perception of an ideal state was attributed to experience at PLC conferences and building-based professional development. However, the responses from participants also indicated that they experienced a distance between their current state and the ideal state.

When asked about how the PLC data process was connected to instructional practices, Barbara indicated that, “I would say the biggest way that [the PLC] impacted me is it’s just made me think about how, or why, I’m teaching something.” This view of the influence of the PLC on instruction was supported by observed PLC conversations. Barbara’s PLC discussed approaches to teaching a specific skill, and the potential benefit to students if the team decided to use the same method across courses and grade levels.
However, during an interview, Barbara voiced concern over a lack of the use of common assessments within her PLC. Without data from a common assessment, she felt that it would be difficult to make instructional changes that were supported by student learning data. This concern was similar to concerns raised by teachers in other content areas in which the teachers in the PLC cover a range of grade levels. The challenge the teachers faced was how to identify common skills that might be measured at different levels of complexity at different grade levels and could also inform understanding of student learning and instructional practices across grade levels:

We want to [use data to improve instruction]. How do we actually apply [what we learn from data]? If you're going to improve your teaching, which is what [the PLC process] is supposed to do, to help improve the learning, you have to be able to take a serious look at yourself and how you're teaching, but one of the ways to do that is through assessment.

While Barbara acknowledged the need for common assessment data to support instructional conversations, she did not indicate that the data should be used to generate new questions or learning so much as to verify the effectiveness of teacher practice. She gave an example of what an ideal conversation about assessment data analysis would sound like:

Look, my kids did better on this test. Your kids did better on this test. Maybe we need to reevaluate how we're teaching it. If we're teaching it better in class A than we are in class B, then maybe class A teacher needs to teach class B teacher how they're teaching it, or somehow have the kids be taught by class A teacher.
This description indicated a proving stance toward student-learning data because the teacher believed that the data proved effectiveness of instruction. In this view, the results of the data analysis did not generate new questions about practice.

John described in general terms how his PLC discussed instructional practices, but explained that his PLC did not have specific conversations about instructional implications tied to the analysis of specific student-learning data. He said, “We like to discuss what worked well in our classroom, and we have some newer teachers that maybe need some help in different areas like discipline or something like that.” He also said that the PLC conversations about learning goals and instructional practice had not had an impact on his own instruction. He said, “I told you that nothing’s much changed in the classroom. I teach the same thing I’ve always taught…”. He did comment, however, that the conversations were collegial within the PLC, “We rarely argue about how to teach something because we all believe that we’re the artist of our own classroom. We respect each other’s work, and so we don’t ever argue about how to teach something.” John’s comments indicated that he viewed the discussions with his PLC as an opportunity to prove the effectiveness of practice rather than to explore ways in which practice might be improved. The comments also indicated a degree of isolation for teachers in the PLC. The members of the PLC did not question the practices or the “artistry” of their colleagues.

Patricia described how the language arts PLC decided that they would practice a specific instructional approach called the Gradual Release of Responsibility when teaching grammar, and then compare common assessment results. The Gradual Release of Responsibility model is a framework for instruction which begins with direct instruction from the teacher, transitions to students working in small groups collaboratively, to guided
individual student work, and finally to student independent work (Fisher & Frey, 2013).

Patricia described her experience of the process as not being “organic” because the teachers in the PLC taught different courses, but that the team did develop an assessment and discussed the data. She wondered about the next steps:

[Collection and analysis of student learning data is] coming in the conversation more, I just don't know if we have 100% figured out what to do with all of the information that we have now. I just have this huge spreadsheet of numbers and we're trying to figure out what to do with it.

Patricia shared a common course with another teacher in her PLC, and she found that one-on-one conversations about student data from that course were more beneficial to her than data analysis in the departmental PLC:

Overall, I think that having learning targets, knowing exactly what I'm assessing every step along the way, I'm not skipping any steps anymore, and I think that that's what the conversation is. It's not just you assume [the students are] going to make the leap, it's being much more explicit about we did this yesterday, here is why we are doing this. That has been helpful, for me. I am seeing a difference.

This quote indicated that Patricia not only interpreted the analysis of data as beneficial to her practice, but that the analysis of data with a teacher who teaches the same course and same content as being the key to the benefit. Her response indicated a need to examine how teachers were grouped for PLC work in the school. The make-up and structure of PLCs was explored in Research Question Three.

Elizabeth also described the difficulty of data analysis within the PLC when all members of the PLC did not teach a common course. She realized that attempting to have a
common assessment across multiple courses did not work when those courses were on different schedules for covering course content:

- It's a formative assessment. It shouldn't be highly involved. It should be a quick check because it's formative. That's where we got stuck. The idea was that everybody would give this test, we said within a week, because they weren't the same classes, so giving it on the same day was challenging because of the requirements for the various courses and the schedules we'd set up in our classrooms, just our classroom routines. That's when we realized, “Wait, we're not teaching these terms all at the same time.” That's the nature of the beast when it's not the same class.

The assessment ended up taking over a week for students in all of the courses to complete.

In her view, the timeline did not allow for the data analysis to be useful for the large PLC because by the time that the PLC completed the analysis, the instruction around the skills assessed was over for the year. However, Elizabeth did use the data for discussion with the other teacher that taught a common course. She was concerned, however, that “Some people didn’t use [the data] at all.” She described the analysis process with the large PLC:

- It was just, “Here are the scores I got.” When we came back and talked about it and said, “What did you do as a result of these scores?” There was silence. We have a long way to go on common formative assessments.

Elizabeth described her experience of a proving stance in her PLC. The results of the student learning data did not generate questions about improving instruction or rethinking practice. Instead, they simply showed the results of past instruction.

Much like John, Patricia, and Elizabeth, Robert explained that the lack of common courses made it difficult for the PLC to collaboratively discuss instruction. He said:
Because we're singletons except for the biology, it's hard [to discuss specifics of instruction]. We're trying to figure out how we can make it so we can look at instructional strategy. It would be really nice to have another chemistry teacher. Because then we could come together and say, “Okay you teach this. I teach that. We're going to teach the exact same thing. We're going to give the exact assessment and then if you kick my butt, I want to know what you did,” but we don't have that.

The response indicated that Robert did not view his PLC as his primary source of learning about instructional practices. However, it demonstrated that Robert believed that if PLCs were structured so that teachers shared a common course, the collaboration would lead to discussion and learning about instructional practices.

Linda did not experience the members of her PLC making instructional changes based on the analysis of student data. In her opinion, the reason that the PLC was not making instructional changes was that the analysis of student-learning data was not generating collaborative exploration of solutions to potential problems of practice. Linda stated that she had clarity on what the rest of the PLC was teaching and what they were assigning. However, she felt, “There’s nothing new coming in.” She said, “We’ve talked a lot about data, and we’ve talked why and what, but a lot of times excuses are made [for the data].” She described in-depth conversations about instruction, but the conversations centered around “how they were already teaching it” as opposed to inquiry into improved practice based on data. Linda’s description of a perceived lack of questions and new ideas aligned with a proving stance in which discussion of student-learning data does not generate new questions.
**PLCs used student learning data to analyze trends in student achievement.** The third component of the framework of Epistemological Stance Toward Student-Learning Data looks at how teachers link the data analysis process to student understanding. This component of the framework asks if data is aggregated or disaggregated when discussed with the PLC, and also describes a continuum between generalizations about large groups of students and specific differences in student understanding (Nelson et al., 2012). As with the first two components of the epistemological framework, the responses from participants about how their PLC makes connections between data and student understanding varied.

For example, Elizabeth described several instances in which her PLC used distributed data where all members had access to the evidence during the analysis process. The first example she gave of using distributed data was from several years ago:

> In order to calibrate our writing, the way that we were evaluating and assessing writing, we gathered writing examples from our classes. This was over the course of a full year. We did it multiple times. We identified five students. We made it anonymous, took their names off the writing, brought their five pieces in the beginning of a course. We all sat down with the same argumentative writing rubric. Even if it was a different point system than we used in our classrooms, the rubric we were using in PLC was the same. We used it holistically and each of us independently graded the five pieces for PLC with that rubric, and then we sat down and we talked because we had a shared spreadsheet.

Rather than leading to deeper discussions about student understanding and instructional practice, Elizabeth felt the data analysis process led to increased teacher and course autonomy.
We looked, “I see you gave two 2s and a 4. I have all 3s. [Another teacher] has no 4s or 3s, they're all 2s and 1s.” It was a process of collaborating and recalibrating our assessment so that when it came to writing, really what we were doing was giving ourselves an out. I didn't realize it then but I know it now. It's because we were giving ourselves an out to not have to use the exact same rubric year to year. My argumentative rubric for speech might look different than another teacher’s argumentative rubric for English 10. The skills, though, are the same.

The quote from Elizabeth indicated that while the PLC used student data as a basis for discussion about the development of rubrics, she did not feel that the discussions were grounded in inquiry. Instead, the discussions allowed for the PLC to demonstrate that they were completing PLC work, but the outcome of the work was less an opportunity to collaboratively ask questions about practice because the teachers designed rubrics specific to a course rather than an essential learning or skill, which led to an increase of autonomy rather than collaboration.

Elizabeth was able to speak about a series of recent PLC meetings in which student-learning data was distributed and the team analyzed the results in an effort to determine next steps for instruction. She described the PLC putting all of the data into a chart that was used to guide conversation:

Then, we had some where there were some 40s and some 50 percents. That was one where all of us tip toed around it. It was more like a process of inquiry, just asking questions. How come this number is ... What's happening in block two where your average is 50%, versus block three where your average is 70%? That's a 20% spread. Something is happening that's different. Are there behavior issues? Are there fewer
kids? Is second block just a rough time of day? Who knows? It actually did lead to some good discussions, and I don't think it would have if we had that combative attitude about it.

Rather than leading to a discussion about instructional practice, Elizabeth described the conversation turning toward a discussion of assessment and grading practices.

Elizabeth explained that the reason that the data analysis led to fragmentation rather than increased collaboration was that teachers have developed assessments over time that they were resistant to change.

We can do the why with the essential [learnings], but when it comes down to the assessments there's things that we don't want to let go [of] because they're fun or they've worked really well in the past. Yes, they may have worked really well in the past in that students did them. That doesn't mean they're assessing the skills you need them to assess.

Elizabeth experienced a proving stance with her PLC. She described the members of the PLC using the data from student assessments to prove the effectiveness of past practice. The fact that the assessment was not shared with other courses made it difficult for the PLC to use the results of the assessment to generate new questions about practice.

While Elizabeth described her PLC as using distributed data in PLC meetings, John explained that his PLC did not see value in distributed data. Instead, he described how he relied primarily on his professional experience to identify what might need to be changed or adjusted from an instructional standpoint in his own classroom based on the results he saw from his own students. Instead of distributing data at PLC meetings, his PLC relied primarily on data in absentia, meaning PLC members referred to student learning data that
was not brought to the meeting or shared with other teachers, or anecdotal data based on generalizations of past experience. He described the process of discussing student understanding by asking one another questions such as “’Hey, how did this test go?’ or, ‘How did that go?’ Generally it's kind of amazing. We're usually always in the same ballpark together.” John indicated that the data analysis he experienced in the PLC simply pointed out what was already known to him and should be known to others as well:

The assessments are usually, I mean, you could tell if they're fair or not because the classes are pretty close, so if they're all getting really low, if both class averages are pretty low, you'd probably think, “Oh, maybe I didn't prepare them well enough,” or something like that. We do constantly evaluate our assessments. We do that, but we don't do enough individual kid talk, you know? We don't talk about the individual kids very much.

The fact that the data was not actually shared among members of the PLC meant that it was not surprising that John experienced all of the members of the PLC as being in the same ballpark. Without an analysis of the actual data, the PLC did not have a basis for discussing differences between teachers or class periods.

While John indicated that his PLC did not use distributed data for most assessments, John’s PLC did utilize referenced data when analyzing the state assessments each year. He said that the PLC spent considerable time each year looking at student strengths and weaknesses on the state assessments. The PLC used the results of the analysis not only to discuss student understanding but also to discuss if revisions needed to be made to essential learnings. If changes needed to be made to essential learnings, the team also discussed
changes to assessments for the next year. John and his PLC placed emphasis on the state assessment data because “The school is evaluated on that one test a year.”

The participants in this study described a proving stance to some aspects of their PLC work. Specifically, the participants viewed a portion of their colleagues as working to verify past practice, show learning results on past instruction, and to comply with school and/or district expectations. The participants also spoke about their PLC using data in order to gather general understanding about student learning as opposed to specific understandings about individual students.

While there are aspects of a proving stance in the responses from teachers, there were multiple examples of teachers who expressed a desire to use the PLC process as a way of improving student learning through the process of clarifying learning targets, using specific assessment data to rethink instructional practice, and to focus on individual student understandings to ensure that all students succeed. Therefore, there was evidence to support a claim that the proving stances described might transition to improving stances in the future.

**The focus of PLC dialogue.** The second dimension of the Two Dimensions of an Inquiry Stance Toward Student-Learning Data examines the nature of dialogue during collaborative inquiry. The framework places aspects of dialogue on a continuum that ranges from inquiry based discussion to disconnected talk. Inquiry based discussion is characterized by negotiation in which conflicting ideas are willingly explored by group members, which forms the basis for learning within PLCs. Disconnected dialogue does not explore conflicting ideas. Disconnected dialogue often moves the PLC away from collaborative inquiry (Nelson et al., 2012).
The ways in which participants characterized the development of dialogue within the PLC was a theme that emerged from the data analysis process. The participant responses aligned with three components of the stance toward dialogic framework: the relationship between individual utterances, the intent or perception of utterance, and the characteristic purpose of dialogue. The relationship between utterances and the intent or perception of utterance components describe the nature of conversational turns and the sharing of ideas on a continuum of inquiry-based talk which builds on ideas and invites dialogue, to disconnected talk in which conversation moves away from the PLC’s purpose and ideas are shared authoritatively. The characteristic purpose of dialogic portion of the framework examines the extent to which dialogue is analytical and leading to specific inquiry or more general discussion about teaching (Nelson et al., 2012).

When participants described the dialogue within their PLC, the participants each pointed to the importance of using the meeting agenda when determining the purpose and the nature of the dialogue. Teachers indicated that many agenda items were generated at the building level, either by the instructional coach, the administrative team, or the building leadership team. The agenda was then distributed to teachers who lead PLCs. Barbara described the way she received and interpreted the content of each agenda, “This is what you guys should be talking about today. This is the article you should be reading and discussing.” When asked about how the agenda items translate into dialogue, she characterized her discussion prompt to the PLC, “’Hey, here's this. Do you guys want to discuss it?’ Most people are usually like, ‘Okay, cool. Let's talk about this for a little bit.’” Barbara’s characterization indicated that the agenda directed PLC conversation, and members of the PLC did not provide input about the items on future agendas.
Robert also discussed the importance of the agenda directing PLC dialogue, and he indicated that he usually received an article a few days before the PLC meeting that would be on the agenda for the meeting. At the time of the first interview with Robert, his PLC had just received an article about teacher endurance during the spring semester. Robert said that most of the PLC had read the article prior to the PLC meeting, and the team had a conversation about the article that lasted a few minutes. The time spent on discussion depended on the degree to which members engaged in discussion. He said, “We’ll just go back and forth and we’ll just talk about it until we resolve it, until we feel like that we fleshed it out.”

Similarly, Patricia described the influence of the agenda on the PLC conversations about investigating new learning opportunities. When asked about how new ideas emerge through dialogue, she said, “I feel like when those conversations happen it's because it's on the agenda and we're obligated to talk about it. I don't often feel like things like that come up on their own.” She could not speak to the exact origin of the agenda items, saying that it was either the building leadership team, the instructional coach, or the building administration. She described feeling constrained by the agenda and provided an example of an inquiry topic that she was interested in but had not been discussed in the PLC because of other priorities:

I don't think we've ever had a conversation about how we build relationships with students. And those are the kinds of things that I'm interested in. Part of it is that we have a lot to do getting our essentials set and our meetings are pretty full. But, the other part is it just doesn't seem to come up.
As Patricia indicated, the work required by the agendas required efficiency in PLC work in order to get through the entire agenda. James discussed concern about the number of topics on the agenda and how to ensure that all topics had enough time for discussion:

I think the biggest problem we have is making sure we don't put too many [PLC generated] things on the agenda, that we don't get to something that was really important. So that we just try to limit the number of things that go on that and then we make sure that we hit all of them equally. We can get stuck on, and this is one of the things that I asked the team to consider, is that we tend to start with celebrations and things, and that celebrations and things last for 45 minutes of the 90 minutes we were given. Well, that maybe needs to move to the end of [the meeting] and celebrate at the end [of the meeting], so that it's contained to the last 10 minutes of our time instead of the first 45 minutes of our time. So we can actually get to the topics and the work that we really need to be focusing on.

This concern was echoed by Linda, who was also a PLC leader. She indicated that the fact that school administrators looked at the notes taken on her PLC agenda had helped the PLC to work to attend to all of the agenda items because there was a sense of accountability. In addition, the team had recently begun to share note taking duties, which she said also helped keep dialogue focused on the agenda items. She described sharing of notes with administrators and the sharing of note taking responsibilities encouraged her colleagues to stay engaged in PLC work.

Two teachers spoke about their PLC choosing at times not to follow the prescribed agenda, either because of pressing student issues or lesson planning that needed attention or
because of feeling like the agenda limited the free flow of ideas. Mary spoke about the need to discuss pressing issues:

Sometimes I will say, I come to my team, “okay I've got this [student learning issue]. How do I approach that?” And then also sometimes because we share so many of the same struggles that… we try to make it “where can we move forward from this” not “let's just sit here and soak in our misery.” So, I think it's been wonderful that way because I think it almost refreshes us every week too. I'm ready to go now. I've had my pep talk from my team.

John also spoke to often ignoring the agenda out of a desire for more time for authentic collaboration about specific classroom issues:

If I had my way, when we had group PLCs there would be a lot more discussion. I mean, that used to be wonderful. Now there's never any discussion. It's just one person talking.

John did acknowledge, however, that when the agenda was ignored, the discussion often became unfocused. He indicated that a fellow teacher had to work to keep the PLC focused. He said, “Her personality's more of let's get on this, let's talk about this, because some of us could talk about nothing for a long time.” John indicated during his answers about the epistemological stance toward student data that he did not change his practice based on the analysis of student data. Therefore, it was interesting that he desired more discussion, but admitted that members of his PLC, himself included, could talk about topics unrelated to PLC work for a long time.

Whether the participants felt that the agenda and note taking expectation focused their collaborative work or inhibited their collaborative work, they all recognized how the agendas
shaped what they experienced as the expected purpose of dialogue within the PLC. However, none of the participants felt that the agendas encouraged the use of student-learning data to provide support for the analysis of student learning, which might have been a reason that participants experienced the focus of their PLC work to be discussing essential learnings rather than engaging in inquiry through the analysis of student learning data.

**Use of data to support claims.** The framework for the nature of dialogue when using student-learning data in PLCs provides a continuum on the use of evidence that ranges from evidence being sought and provided, with questions emerging from analysis, to statements being asserted as fact with no evidence provided or sought. When asked to describe the PLC approach to evidence of student-learning, all participants described an understanding of the use of evidence being an important aspect of PLC work. The description of how each of their PLCs actually incorporated student-learning evidence varied among participants. However, all participants expressed both a desire and a perceived expectation to incorporate more student-learning evidence into their PLC work.

When John was asked to provide a description of his PLC’s data process, he began by describing what he viewed as the expectation from the district about the process. He also described why he felt it had been difficult for his PLC to incorporate the use of student-learning evidence as a component of their work:

Well, I'll tell you what they want us to do, and it's something we're going to be talking about, we're going to work on. [District administration] would like for us to collect data and bring in our scores. Our scores are right on the computer so we could do that too. We don't do that enough, all right? We don't do that enough, and I'll tell you why… This goes back to the PLC part that bothers me. We are a lot of times given
nonsensical types of stuff to do that pulls us away from [data analysis], and so during that hour, when we would like to be doing [data analysis], we're supposed to fill this form out, we're supposed to do this, we're supposed to do just what I call busy work that takes us away from progress.

John then described the nature of his PLC’s work on assessments. He indicated that completing planning work was necessary before the PLC would be able to discuss evidence of student learning:

We haven't been collaborating on our scores very much. We spend most of our time making sure that our assessments are the same and our timing is the same, that we're staying at the same pace together, or the same chapters, or the same area. We spend most of our time making sure that happens and doing other things.

John then wrapped back to where he felt that the PLC needed to change their current practice:

Yeah, we don't provide evidence. We really don't. Like I told you earlier, that's something we need to, and we heard it in our large group, we need to start doing that. We need to start having concrete stuff in front of us and really breaking it down a little bit more. We just talk about how did this go, how did that test go, and if there's a certain area they're struggling on, we just pretty much agree on that.

John was able to describe his interpretation of the district’s expectation for discussing student learning data, and he expressed concern that there were other aspects of PLC work that are prioritized over discussion of student learning data. However, he did not offer suggestions about how his PLC might move closer to the expected data use.
Compared to John, Patricia had slightly different descriptions of how her PLC used student-learning evidence. When asked if the members of the PLC asked for evidence to support claims, Patricia responded simply with, “I don’t think so.” Interestingly, Patricia’s PLC colleague, Linda indicated that the PLC was moving in the direction of asking for evidence. Linda described a sense of trusting relationships leading to a degree of comfort in asking for evidence, and in her view the trusting relationships helped to keep the focus on the student data as opposed to personalizing the data. Neither Patricia nor Linda, however, provided evidence of specific PLC interactions that supported their contrasting interpretations.

Elizabeth agreed with Linda that the PLC was moving toward asking for evidence to support claims. While Linda saw improving relationships and trust as the factors leading to increased use of evidence, Elizabeth felt that members of the PLC were becoming more aware of data processes, and it was this awareness that facilitated the use of evidence. Similar to her PLC colleagues, she was unable to describe specific examples of providing examples of data analysis within the PLC, but she was able to provide a description of data analysis that she had done on her own with her own classroom data, and described how the PLC might apply the same processes in the future.

Mary described a PLC process in which evidence was used to support claims and decisions. She also described ways in which the analysis of evidence generated new questions for the team to consider. She provided an example of how evidence was used to guide a PLC decision on how to work to support teachers working with specific students:

And we look at grades, attendance, and kind of GPA at the end of a term or credits of where they're at. And we are then doing some interventions with them. Whether we
kind of just split up as a team and say, “You take these teachers. I’ll work with these teachers.”

She also provided an example of how the same evidence generates questions for the team to consider:

Then at the end of the term, we tackle where kids are at [in terms of] GPA, and where kids at credit wise. Are we looking at different programming for that student to follow near? Depending on that data. Attendance is another one. So then really, are we using the supports? Maybe this student it's just attendance, but now it is affecting everything else. Is there a support?

According to Robert, there were two factors important to his PLC’s use of evidence in their conversations, one that was in place at the time of the interview and one that he indicated would most likely be implemented in the next school year. The factor that was already in place in their use of evidence was that the teachers had been intentional in following a data protocol that a PLC member brought to the team. By using the same protocol each time, the teachers became used to asking for and providing evidence. Robert compared the protocol to being a McDonald’s franchise. He said, “You get a McDonald’s franchise, and you get all the steps with it. You follow these steps, you’ll have a successful McDonald’s.” Robert described the PLC’s current use of evidence:

We do question each other, but I think most of us, we're on the same page, but our group is close enough, if somebody dissents, they can speak up. People have dissented and spoke up, but for the most part, when we get together and we look at the data, we just start asking each other, “What does this mean?” We start bouncing it off each other until we finally come to a consensus. Okay, “This is what it means.
Okay now, how do we make a plan in order to change this?” And that's where we all come together and do the same thing. No, we don't agree on everything, but it's pretty amicable. It's a really good ... It's a really great team where you can say exactly how you're feeling and not feel like you're being discounted or like somebody's trying to run over you.

Robert explained that in the future the teachers in his PLC will share more common courses. As he explained in his description of his PLC’s epistemological stance, in Robert’s view, common courses would result in more common assessments, something he called the “linchpin” of PLC work because he felt that the data from common assessments would lead to deeper discussions about student understanding and instructional practice.

The participants’ perspectives on the use of evidence during PLC meetings showed consistency in that they all indicated that the analysis of student-learning data and using the evidence generated from the analysis to generate collaborative inquiry was an important aspect of PLC work. However, the descriptions of colleagues actually soliciting evidence to support claims varied from non-existent, meaning that no evidence was provided or solicited to support claims, to emerging negotiation, in which evidence was referred to or shared.

**Nature of Questions.** The framework for the nature of dialogue when using student-learning data in PLCs provides a continuum on the nature of questions that ranges from an inquiry stance in which questions emerge from artifacts, to a disconnected stance in which questions are procedural or technical in nature. Teachers in this study described the nature of most questions in their PLC as procedural and technical. For example, John linked the procedural nature of the PLC’s questioning to the desire to comply with leadership expectations of PLC work. He indicated that he would like to have PLC meetings dominated
by questions of how teachers are incorporating instructional practices and the student-learning results of those practices. He said, “I think it would be amazing what we’d get out of each other. We don’t do enough of that.” He said that what the PLC tended to do instead was seek clarification on, “the stuff that we have to turn in, the stuff that we have to document, put on the docs and turn in.” He expressed concern that the PLC spent time working to find the correct “words, phrasings, and terminology” and not enough time asking questions about student learning.

Similarly, Barbara connected the nature of PLC questions to the adherence to the agenda for meetings. She indicated that if questions and especially follow-up questions came up in meetings, they were most often surface-level questions. When asked why the follow-up questions were surface level, she responded saying, “I would say it’s very surface level just because nobody wants to step outside their bounds with their colleague.” She clarified that out of bounds meant questioning teachers’ decision making or instructional approach. She expressed a desire to have questions lead to a collegial examination of practice rather than perceived defensiveness. She recalled a few times that teachers did ask for clarity on why a decision was made that resulted in arguing rather that seeing the question as an opportunity to look at the decision from a different perspective.

Two participants, however, discussed their PLC moving beyond procedural questions. Robert described situations where questions emerged spontaneously from the team’s work on the agenda. The articles and other prompts from administration in the agenda brought about questions about how the PLC might apply the ideas in the article or how the PLC’s work related to the prompt. He also described questions about what the essentials should look like at each grade level driving future PLC work. Mary said that her PLC used questions to
achieve clarity on what needed to be accomplished at each meeting and what the data meant for their work. The search for clarity made meetings productive, in her opinion. She said that if the team ever got stuck, through questioning one another, they were able to find a way forward.

**Knowledge and Beliefs.** An important component of the nature of dialogue when using student-learning data is the way that teachers in a PLC discuss the nature of their knowledge and beliefs. If knowledge and beliefs are fixed, meaning they are not questioned or re-examined, it becomes difficult for the PLC to take an inquiry stance in their work because an inquiry stance for the PLC requires all members to work toward the generation of common meaning through the explicit expression of wonder and uncertainty (Cochran-Smith, Lytle, & Lieberman, 2001). All of the participants spoke to the varying degrees about ways in which the teachers in their PLC were willing to question and reexamine the nature of their knowledge and beliefs.

A theme that emerged from asking about the PLC approach to knowledge and beliefs was the approach to reflection on current practice and learning about new practices. Linda expressed frustration at the lack of progress in some members of her PLC to reexamine assessment practices. She stated that she could not understand why after extended conversations and having read multiple articles as a PLC, some of her colleagues remained resistant to embracing new approaches to instruction and assessment. She attributed the resistance of her colleagues to their desire to maintain individual control and autonomy over their classrooms. Linda also expressed frustration that when approaching book studies or when reading articles, the teachers in the PLC adopted many of the same behaviors that they complained about in their students. Specifically, she felt that some of her colleagues did not
actually read the articles and therefore were either unable or simply refused to participate in article conversation. Linda also expressed, however, that she had some reluctance to share knowledge and expertise with her colleagues. She said it was difficult to talk about her instructional strategies at times, because she did not necessarily want her colleagues using them before the students got to her class. Linda’s comments expressed an interesting stance toward knowledge. She described frustration at what she perceived as colleagues who did not want to engage in learning and sharing new ideas. In some ways, however, her comment about her colleagues acting like the students they complain about reflects back on her. She admitted that she did not always want to share ideas with her colleagues due to a desire to have autonomy in her own classroom.

Participants expressed that ideas that new members brought into the PLC influenced the approach of the PLC toward knowledge and beliefs. Elizabeth described some resistance in experienced members of the PLC toward revisiting some of the content standards. As a less experienced member of the PLC, she described wanting to revisit the standards because of new learning that the PLC had participated in as well as the results of some student assessment. She said, “Experience matters, it really does. It's not easy for younger teachers to talk to more experienced teachers. It's not easy for younger teachers to tell more experienced teachers that they disagree.” Elizabeth described her approach as diplomacy. She recalled asking a lot of questions of more experienced members of the PLC, even if she already had her own answer, because she wanted to draw on the resources her colleagues offered. She also wanted to make sure that her colleagues saw her as open to learning.

Linda expressed that in her experience, the new members of the PLC were the only people bringing in any new ideas. She felt that having two new members of the PLC
completely changed the dynamic of the collaboration compared to previous school years. The changed dynamic, however, was limited to Linda and the two new members of the PLC. Linda described that the two members whom she described as fixed in their ways had not changed their stance toward participating in meetings. Patricia, a new member of the PLC, expressed that she felt judged by the experienced members. She felt that the experienced members spoke to her in a condescending way, often referencing the fact that she was an inexperienced teacher. She described that she sometimes refrained from conversation because she was concerned about being judged. Therefore, Patricia reported engaging in discussion about new ideas often outside of the PLC meeting time and did not involve all of the PLC members.

**Social Relationships.** Participant responses about knowledge and beliefs led to discussion about the ways in which the participants experienced the social relationships among the members of the PLC. Each of the participants described a desire to build and maintain professional relationships with their colleagues. However, many of the participants experienced concern about difficult conversations and conflict developing in their PLC. James described the social relationships within the PLC as congenial, meaning that the teachers were not willing to ask tough questions of one another. He felt that the unwillingness to ask difficult questions often resulted in a lack of collective accountability to work that the PLC agreed to pursue, especially bringing examples of student work to the PLC. He felt that his PLC lacked true collaboration if the teachers were unwilling to ask tough questions or hold each other accountable. This response indicated James evaluated his PLC against his conception of an ideal PLC. He did not indicate that he felt equipped to help move his PLC toward the ideal state.
Elizabeth reported that she naturally avoided creating conflict within her PLC, but that over time, it became easier for her to be more assertive during conversations. She explained that for her, it was not always necessary for the group to agree, but what was important was that the conversation took place. She felt these conversations were possible if “non-negotiables” were in place such as a clear viable curriculum and common assessments. As more common assessments were built, the analysis added clarity to the curriculum, and the conversations fostered a more collaborative culture. She said that she felt the PLC was moving in that direction, and that there was a better understanding of the specific strengths that each member brought to the team than had existed in the past. She acknowledged that conflict still occurred, however. She attributed conflict within the PLC to a human desire to avoid change. She said, “People don’t like it when you try something new and the motive is not clear. If you try something new that may potentially be controversial or has been controversial in other districts, people don’t like that around here.”

A tension emerged between autonomy and collaboration when Patricia was asked about the social relationships in her PLC. She reported experiencing collaboration on what was expected of the PLC through agendas. However, she did not feel that the PLC was willing to collaborate on other topics of importance. She used the approach to grading student work as an area where there was a lack of collaboration in the PLC. When she provided her PLC with examples of how she was grading student work, she felt like she was attacked for not seeking consultation prior to making a decision. She felt that the topic of grading could have opened up a line of inquiry, but instead she felt she was told that she was “doing it wrong.” The experience made her not want to offer ideas because she did not want to make others feel the way she felt after the grading conversation. She said, “I don’t want to
tell you what decisions are right for your kids.” A follow-up question asked if the PLC had conversations about how to find common ground when there was disagreement about how to make a decision or how to proceed. She indicated that they had not had such a conversation and indicated a desire to do so. She explained that she did not know how to make the social relationships better:

I don't know what to do now. This has become an interpersonal conflict that's about more than us disagreeing about what's good for kids. This is a new experience for me. I've had a few one-on-one conversations about that but even then, I feel like a lot of it is either agree to disagree or one of you is right and one of you is wrong and it will pass. We haven't had an explicit conversation in our PLC about it since then. It would be nice to be able to do that or have the tools to be able to do that. It feels dumb to say that you don't because we're all adult humans who have had conflict before, but it's different when it's professional.

She attributed the conflict between a metaphorical old school view and a new school view, and felt that that divide existed in most of the PLCs in the school. She worried that the social relationships had reached a point where the conflict was personal and not just about disagreements on practice. As the PLC tried to reach consensus, there was a feeling that agreeing with one colleague meant the other colleague was not only wrong on the issue, but wrong in overall approach to teaching and collaborating. Patricia saw the solution to the social relationship issue in the hiring of new staff. As the balance shifts, she believed the message will be, “get on board or decide what you are going to do.”

John described strong social relationships in his PLC because they have worked together long enough to know each other well. The strong relationships have not resulted in
a lack of conflict during PLC discussions, however. He recounted a recent instance where conflict occurred:

Arguing [about] what's important happens. We had that yesterday. There was a couple things in essentials that I thought was important but somebody, a teacher, didn't think was important. We talked that out and I gave my view, she gave her view, and don't know if we had a middle ground there or not, but yeah.

While he was not able to determine if the PLC found middle ground in that particular situation, John felt that conflict was an important part of PLC work if used productively. He stated that, when used correctly, conflict was a good tool because different viewpoints were explored. The fact that John was not able to remember if middle ground had been found between viewpoints calls into question whether or not the conflict in this instance was actually productive or if both parties agreed to disagree and continue with their individual past practices.

Linda implied there was a difference between PLC work and her relationships with her colleagues when she said, “It's not the PLC that's tough. What is tough is that it is your peers and your colleagues. I don't like the fact that there has to be a leader, but there does actually because even if I try to sit back, we'll get completely off task.” She felt that her role as PLC leader put her in a position where she risked doing damage to the social relationships with her colleagues as she tried to guide PLC work. She said that the collaboration in the PLC was “awesome if you want to be onboard.” Mary expressed a view of her PLC that was very similar to that of Linda. She said that most of the people were “on the boat rowing, but we have some people that are still on their life boat saying, ‘This isn’t my thing.’” She indicated that time and exposure to PLC work will improve the social relationships in PLCs.
When conflict arose in PLC work, the participants experienced the conflict moving from cognitive conflict to conflict that became interpersonal. The participant responses did not provide evidence that colleagues intentionally made conflict personal. The responses, however, indicated that discussion of classroom practice, discussion of new ideas, and acknowledgement of differences in professional experience were interpreted as having personal connotation as well as professional connotation. The perception of interpersonal conflict limited the ability of the teachers to engage in collaborative inquiry because the dialogue did not support the exploration of questions and the construction of new understanding if the teachers felt defensive.

**Research Question 2: Relationship Between Inquiry Stance of PLC and the Individual**

In addition to the description of the stance of their PLC toward student-learning data, the participants also described the relationship between their personal inquiry stance and their perception of the inquiry stance of their PLC. Three themes emerged when participants were asked to describe how they perceived similarities and differences between their personal stance toward inquiry and that of their PLC:

1. Teachers experienced conflicting viewpoints on the nature of professional knowledge and professional practice.
2. Teachers experienced conflicting approaches toward collaboration.
3. Teachers described inquiry stance through the perception of efficacy.

**Relationships of Knowledge and Practice.** Participants described the ways in which they perceived the interaction of knowledge and practice in three different ways. First, participants described formal, research-based knowledge and theory, which was accessed through participation in professional conferences, graduate work, and professional journal
articles. Second, participants described practical knowledge gained primarily through professional experiences. Third, participants spoke of knowledge generated through a collaborative process of intentional investigation in the classroom. The descriptions of the relationship of knowledge and practice align with the work of Cochran-Smith and Lytle (1999). The authors describe formal knowledge as knowledge for practice, experiential knowledge as knowledge in practice, and knowledge generated through a collaborative process as knowledge of practice.

There was a range of responses when participants considered the conception of knowledge for practice, both as an individual and for their PLC. A source of formal knowledge and theory for the participants was the summer PLC conferences, specifically the PLC Institute put on by Solution Tree, where Richard and Rebecca DuFour were primary presenters. Participants who had attended a PLC conference expressed a belief that they had learned knowledge for practice and that additional knowledge for practice existed in the resources available from Solution Tree. The participants who had attended the conferences expressed a degree of comfort in their understanding of PLC work and appreciation toward the district and building guidance for the PLC work because they saw a significant alignment with the knowledge for practice they had gained as a conference participant. Teachers who had not attended the conferences expressed some skepticism of the value of knowledge for practice, whether in the form of outside resources or from colleagues who had learned at the conferences. Participants explained that the skepticism emerged when formal knowledge from outside sources was used to question current practice.

Barbara experienced the participation in the PLC conference as important to her learning and important to her understanding of the PLC process. She indicated that there
were topics and ideas discussed at the conference in a way that she had never thought of before, specifically approaches to assessment and grading. She felt that the conference made her re-think her approach to teaching. She often referenced posters that were created by the district for each room in the school that are based on the four DuFour questions as a reminder of how PLCs should operate. Barbara’s responses indicated that she felt that expert knowledge was necessary to improve PLC processes.

Elizabeth discussed at length her approach to formal knowledge gained through reading about research and theory. She said that prior to the current school year she was able to identify when things were not working in the classroom or in the PLC, but she was not able to find solutions. She felt that she needed to access research to build her professional knowledge. She indicated that she found that knowledge through research on PLCs. She said, “Over time I’ve gathered the ‘why’, and I’ve done some more learning for myself.” She said that she found the research to support her work. She felt that her PLC was slowly moving in a similar direction in their approach to knowledge for practice. When asked about the PLC searching for formal or theoretical knowledge, she said:

We don't [talk about it] very much yet. I think probably the yet is the most important word in that sentence. We're getting to the place where, or we are in the place where, we are finally comfortable talking about common formative assessments and getting that on board with aligning our curriculum. In one sense, we'll go and we'll do some research on our own about the [common formative assessments] and bring that back, or every once in a while, someone will have an idea and they'll do research and then bring it to [the] PLC and say, “Hey, here's what I'm thinking. Here's why. Is this cool? Can we do this?” Every once in a while that'll happen, but I think this year in
particular has been a really big growing year for us. Just as a group of professionals, going from that place where we were doing things because we were told to do them to we're slowly reaching that place of we're doing things because we want to do them, and we know that it's right and this is the time and place to do it.

While Elizabeth felt that she had found the ‘why’ for PLC work for herself, she described her PLC as still working to clarify why they do their work. She felt that the PLC needed a way to transfer the theoretical knowledge into practice. She said that she felt as if her colleagues did not want to be handed a book to read. She said they wanted someone to talk with them and show them the application of the theory. Her discussion of the application of theory showed that Elizabeth questioned the value of formal knowledge and theory without a contextual understanding. She said:

I do think that first and foremost, you go to the research and you go to what the experts out there say is best practice because why are you wasting time otherwise? Go find out what somebody else has already put in the leg work to do, and try that because it’s probably going to work, or it'll give you a better success rate than you have right now. The experts say that just because they write it and publish it on a page in a book doesn't mean it's going to work for all students. Nothing works for all students, not 100% of the time. Then you do have to do some of that problem solving and that guess and check, right, that inquiry based ... well, I guess it's not really inquiry based, but it's problem solving, critical thinking. Okay, great. This is what Marzano says in his book. That's so pretty with all those numbers and those nice little charts and everything. How do those numbers translate to actual humans in my classroom? How am I going to make this work with 84 minutes of planning time that
I have today, knowing I won't have any for the next two days? It's just a marrying of the theory with the reality of the classroom and making things practical and reasonable, doable.

In her response, Elizabeth articulated tension between formal knowledge and its application. While she acknowledged the importance of learning from experts, she did not see expert knowledge as being directly applicable to her specific professional context, and she perceived her colleagues as having a similar stance toward expert knowledge.

Participants discussed their district and school administration as a source of knowledge for practice. Elizabeth indicated that the knowledge for practice from the administration had increased considerably during the 2016-2017 school year with the new administrative team. Robert said that he felt the research was coming from the Management Leadership Team in the building, who met once a week to send out research to teachers. He said, “It really is top-down. The captain of the boat is calling the shots, and then it’s just going down everywhere else.” Patricia said that she had received some research that had been conducted in a neighboring district from her instructional coach. She felt like she had a basic idea of the research results but would not fully understand it until she put the ideas into practice.

John expressed skepticism of the value of formal knowledge and theory. He did not feel that there was a direct connection to practice for him or for the members of his PLC. While he expressed a belief in collaboration, he felt that learning from research had to be very carefully planned and well thought out. He said, “We really just do a lot of repeating on things that [the coaches] have heard, and we really don’t have an avenue to do any of it. We don’t have a plan. We just talk about stuff.” He elaborated the point:
Yeah, for example we have teacher coaches here. We do that program. They go to conferences or they go to some kind of conventions and they'll bring back information. I'm kind of a dinosaur but I'm also suspect, I'm willing to change. I'm always willing to learn. I always want to learn new things, but it seems like we hear a lot of things, we spend a lot of time, we don't get to the points. We have situations where we just put up a bunch of words and we analyze those words. I mean, it's a lot of just filler type of stuff in my opinion.

He shared that in his opinion, the experts were the teachers, or as he put it, the people sitting and listening to the presenter during professional development. John and other participants placed value in knowledge for practice, but they also believed that without application in context, the formal knowledge was not as valuable as knowledge gained through classroom experience. John indicated that he did not feel that the knowledge that he had developed through years of experience was valued, and he felt that he should have more time to share his knowledge from experience with less-experienced colleagues.

John was not the only participant to indicate that teaching experience was a source of knowledge. Each of the participants spoke about the concept of knowledge in practice and how experience or the lack of experience in teaching was perceived as knowledge or the lack of knowledge in teaching. The privileging of knowledge in practice was not limited to participants’ evaluation of their own expertise based on experience. The participants also discussed how the PLC process provided an opportunity to learn from more experienced colleagues. Therefore, the participants’ stance toward inquiry privileged practical knowledge gained through experience.
Patricia indicated that she felt like her colleagues thought that, “expertise is just you’ve been teaching the longest, and so you know the most.” She acknowledged that her colleagues with master’s degrees have content expertise, but she felt that her own knowledge and expertise were undervalued due to her relative lack of teaching experience. She expressed that if the other members of her PLC were more willing to have discussions about each member’s strengths and weaknesses, the entire team would have the opportunity to learn from one another. However, she said that this type of reflection was just not part of her experiences of PLC conversation. She said:

So, a lot of times in conversations, not just in my PLC but in the school, I sometimes feel very judged for the way that I do things. I know I'm doing it and I know that it's working and so I just keep to myself a lot of the time and let things play out. That's part of it. I just don't feel as though people want to hear my voice, which is a harsh way to put it, but I feel like I get discounted a lot. Especially being young, especially looking young. I think people forget that I have teaching experience. A lot of people talk to me like it is my first-year teaching, which it's my third year. There's not a big difference but this isn't my first rodeo.

During her interview, Patricia used a PLC meeting where I had observed the conversation to describe how the PLC diminished her knowledge due to her relative lack of expertise. She referenced several comments from the PLC meeting that were made toward her that hurt her feelings. During the PLC meeting, she expressed frustration with a student who was a behavior problem in her classroom. A colleague said, “It sounds like you’re an easy target.” The implication was that as a relatively inexperienced teacher, Patricia was not strict enough
with her students. As Patricia recounted the comments from the meeting, she said, “I didn’t realize I was internalizing as much as I was.”

While Patricia did not feel that her own experience was valued by colleagues, she placed great value in learning from the experience of others. She discussed conversations and classroom observations that she organized with experienced teachers from outside her PLC. She described receiving valuable feedback from a colleague after he observed one of her more difficult classes. She felt that he provided actionable information and did so in an affirming way. Patricia also discussed observing one of her PLC colleagues with extensive experience in the classroom. She said, “I didn't understand what things were like in her room, and it was eye-opening in a good way to see her interacting with her students and enjoying what she does and doing a good job. That was really helpful for me to see.”

Elizabeth spoke of difficulty in reaching a common understanding with an experienced colleague. Elizabeth initially saw the colleague as being resistant to collaboration and fixed in her ways of instruction. She explained:

Then, we have our fifth member who is an excellent teacher, has been teaching for 20 years or more. I don't know the exact number. Hears things differently, so hears me or my other two colleagues talk about what we're doing and why we're doing it, and I'm 90% sure that she's doing it too. She just hears our vocabulary differently. I think we actually do share that philosophy. We just talk about it differently. It leads to a very difficult conversation because we end up butting heads for 30 minutes. It's in the last five when somebody says something and everyone's like, “Exactly. You mean we've been talking about the same thing for 30 minutes?” “Yes.” “Okay.”
While such interactions were frustrating, Elizabeth also acknowledged that there were opportunities to learn from her colleague’s experience. She said she has often asked, “Okay, I'm sure you have already dealt with and solved this problem, so tell me what's worked for you.”

While both Elizabeth and Patricia expressed uncertainty due to their lack of experience in the district, Linda suggested that she experienced the new members of her PLC as a potential source of new learning. She said, “Thank goodness for new people, because at least they're bringing in new stuff, but our collaboration content-wise is somewhat lacking. I've definitely been very vocal about that.” She described that she felt that most of her new learning came from what she individually sought out on sites such as Twitter. She did not feel that the collaboration in the PLC provided enough new ideas for her practice. “I really like the collaboration, but I feel like now we're to the point where we're sharing... I know pretty much what they're doing in their classrooms.”

Robert credited the support from his colleagues’ knowledge in practice with making him a successful teacher. He said of his PLC:

These people have been teaching for so many years. I'm finally feeling in my sixth year, a lot more comfortable with teaching. Trying to get kids more active. Active engagement. Trying to do all these different things and just being able to bounce off ideas off of ... Just say, “How did you do this? I can't get kids to understand this…” If you can sit there and get from experts, because I feel like they've been teaching 15 to 20. They are experts in their field. I am still a novice. If I can get from them, you know, and not make as many mistakes as they did, you know?
Robert gave credit to the rest of his PLC with not only sharing the knowledge gained through experience, but also being interested in continued collaborative learning. While the experienced teachers in Robert’s PLC saw value in ongoing collaborative discussion and learning, John did not. He said that while he was sure that younger teachers were getting something out of the PLC process, he however, as an experienced teacher did not see collaboration as an opportunity for his own learning. Elizabeth identified members in her PLC as having a similar outlook to John. She said:

> There're a couple people who depend really heavily on their own experience, which is fair because they have good experience and they've had good success. I would question that if they weren't successful with their students.

While Elizabeth used the phrase “successful with their students,” she acknowledged that success was relative. She expressed concern that her colleagues that depended heavily on their own experience were not willing to learn from colleagues who had more success based on the analysis of student learning data in the PLC. She attributed this to a bias against all sources of knowledge other than experience.

Participants offered rich descriptions of their views on formal knowledge and knowledge that emerged through experience. While the participants discussed learning from colleagues in their PLC, the descriptions of PLC work did not indicate that collaboration generated new knowledge distinct from formal and experiential knowledge. However, participants spoke of both an understanding of how knowledge could be generated through the process of problematizing their practice and collaboratively investigating solutions as well as a desire to put more emphasis of time on the process of generating knowledge of practice. For example, Mary described how her PLC monitored student progress, and while
often the students made progress, there were times when the achievement plateaus or moves in a negative direction. She spoke of engaging in small-scale action research with teachers to attempt to determine why the results were not improving, so they could plan to better support the student.

Elizabeth was optimistic that her PLC was moving in the direction of experiencing their collaborative work as generating knowledge of practice. She indicated that as relationships were strengthened and trusting relationships were formed, the team would embrace learning from the analysis of classroom practice by examining student learning data. She said that the PLC was still experiencing tension between collaboration and autonomy, but she hoped that her colleagues were beginning to view collaborative learning as allowing for professional, and at times autonomous, decision making in the classroom. She said:

Just because I'm doing this in my classroom doesn't mean that this mandate from above is going to come down. I'm just trying it because I did research and this person, this person, this person and these three studies all say that there was benefit to this kind of student. Well, I have that kind of student right now and I need to figure out a way to help them, so this is what I'm trying.

Elizabeth hoped that with additional time for collaboration built into the schedule, the PLC would spend more time in an inquiry process.

The participants in this study acknowledged the existence of different viewpoints on knowledge and practice among their colleagues. The participants recognized the existence of knowledge generated through research as well as resources such as professional development, conferences, and journal articles that would provide access to the research. The participants also recognized the existence of knowledge generated through the practice
of teaching and privileged experience as the primary method to gain practical knowledge about practice. While some participants discussed the potential for collaboration to be a source of knowledge, there was no evidence that this potential was realized.

**Stance Toward Collaboration.** A theme that emerged from asking participants about differences between their personal stance toward collaboration and that of their PLC was that participants viewed themselves to be more invested in the inquiry process than what they experienced in their collaborative team. Linda expressed a desire to dig deeper into the “art and science” of teaching in an effort to more broadly connect learning goals and concepts to instructional practices. She expressed frustration that her PLC “just keeps bouncing ideas” around the PLC rather than searching for new ideas or putting new ideas into practice. Elizabeth and Patricia also expressed the concern that there were members of the PLC that held the team back from inquiry and exploration of new ideas. The members held back the PLC by choosing not to implement changes to practice and dismissing attempts to explore new learning. Elizabeth said, “I think it’s predominately personal.” She indicated that, “There is not a single person in this building who’s planning on staying in this building that does not put the students first.” However, she felt that not all teachers in her PLC were convinced that the PLC process is the best practice for improving student learning.

Elizabeth felt that the key to getting the rest of her PLC to commit to collaboration would be helping all teachers understand the potential for professional learning when teachers’ strengths are shared. She said, “You just have to get over the hump of … It's not an us versus them scenario. This is not, “These are the good teachers and they're the bad teachers.” This is not admin versus faculty.” She expressed belief that her colleagues were convinced that the ultimate goal of collaboration was to have all teachers teach the same
content the same way, and therefore they felt that collaboration might potentially take away their professional autonomy.

Barbara experienced a difference between her commitment to her PLC and her interpretation of her colleagues’ commitment. She experienced a lack of accountability and follow-through, which led to a lack of trust in her team. She said, “If somebody can’t follow through, that’s so frustrating for me.” Her biggest concern with follow-through was having colleagues bring student-learning data to PLC meetings. Without the data, the team was not able to move forward in their work.

Another theme that emerged from asking participants about the relationship between their personal stance on inquiry and that of their PLC was participation in collaborative inquiry outside of the PLC. Patricia built relationships with teachers outside of her PLC that facilitated peer observations and feedback:

I started building some more relationships with other people in the building, talking to, I've been getting out during my fourth block planning and just observing everyone. That's how I learn. I love watching other people do what they do and so just getting out and communicating with other staff members in that way. “Hey, can I come see you do this?”

Pursuing inquiry through collaboration outside of the PLC led to decisions and practices that were at odds with some PLC decisions. For example, Elizabeth described circumstances where she decided to not follow a decision reached by the PLC on an approach to grading an assessment. Her decisions were in part because she did not agree with the PLC consensus, and in part because she wanted to collect data to determine if the data supported the PLC consensus. She described how these decisions played out in PLC conversation, saying, “It's
sort of a long-term strategy, laying the groundwork of, ‘Thank you so much for your opinion. I'm going to weigh that and decide what to do as a professional. I'm not just going to do what you tell me to do because you told me to do it.’” She felt that these decisions position her as an evaluative and reflective professional.

Patricia provided an example of pursuing a course of action at odds with a PLC decision. She explained that she and Elizabeth decided to pursue a grading practice that was different than what the members of their PLC viewed as best practice:

A couple of us did it anyway because a PLC is not about dictating practice. It's about collaborative learning and bringing back data. Since that was true and since the data we were collecting was not reflective of what we needed it to reflect, we changed what we were assessing.

Patricia’s explanation of the reasoning behind her decision indicated that she intended to share the results of the decision with the PLC at a later date. In her view, the data from her alternate practice would inform future decisions about grading practices.

Elizabeth said that the decision led to some tense PLC conversations. One of those conversations took place on a day in which the researcher was observing their PLC. However, Elizabeth reported that the PLC waited until the researcher left the room to begin the tense conversation. While the team did not disagree in front of the observer, Elizabeth did not hesitate to recount her experience of the conversation:

Those are difficult conversations to have, and you just have to take a deep breath and have them. I think those conversations are impossible when either side, or however many sides there are, when anybody doesn't have the facts, doesn't have the research, and doesn't have the data to support them. Whether that data comes from their own
classroom over a period of years, or days, I don't care how long, a period of time.

Whether that data comes from this other high school 20 miles up the road that's essentially the same demographic and size and here's what they're doing over here, we should try it here, because it's working there and what we're doing isn't. We have to do something different, we may as well try it.

Patricia reported that the collaboration and inquiry outside of the PLC was supported by the building administration. Patricia and Elizabeth approached the principal to explain what they wanted to investigate with grading practice, and he supported their work because of the information it would provide to the PLC in the future.

Each of the participants in this study explained their personal stance toward the nature of knowledge and the nature of collaboration in different ways. However, there were similarities in that teachers experience tension between theoretical knowledge and experiential knowledge. Views on theoretical knowledge ranged from a desire to be exposed to much more research and theory to a mistrust of “expert” opinion. Views on knowledge gained through experience ranged from a significant reliance on experience to seeking new insights by bringing in new members to the team. Finally, while all participants expressed a belief in the potential to improve practice through collaboration, participants did not feel that their PLCs reached that full potential.

The descriptions of the relationship between the teachers’ epistemological and dialogical stance toward student-learning data and their PLCs’ stance toward data use help us to better understand the teachers’ experience of the phenomenon of the use of student-learning data to influence instruction and assessment. The descriptions provide insight into the ways in which the participants in the study conceptualize the nature of knowledge and the
transmission of knowledge. The descriptions also provide insight into the ways in which the participants conceptualize professional collaboration.

**Teachers described inquiry stance through the perception of efficacy.** Several participants spoke about a balance between feeling supported professionally through collaboration and feeling evaluated by colleagues through collaboration. The theme of efficacy emerged through participant discussion of the ways in which the perception of openness and trust within the PLC led at times to feelings of being supported in their work, but at other times led to feelings of inadequacy as a professional. Patricia was a new teacher to the district with only a few years of teaching experience prior to starting at Elberon in 2016. She described initially wanting to teach at Elberon because she did not feel challenged at her previous school and wanted to be a part of a school and a PLC where she would be constantly supported and challenged to improve her practice. Patricia described the 2016-2017 school year as being “a little bit of an ego blow” because of the high expectations that she had for herself. She described the difference between her past experience, which she described as a setting in which her administrator only came to her classroom during the evaluation period and fell asleep during the evaluation, and the start of the 2016-2017 school year:

But to go from that to in the first six weeks of school, there was an administrator in my room every block just observing. We have K-12 literacy specialists. [An instructional coach] was in my room once a week. [A principal] was in my room all the time. I just got feedback overload and it wasn't all negative but I just wasn't used to ... I'm pretty hard on myself and then to have a lot of other people come in and be
like, this is working, this isn't. I got really, really down on myself and I had to actively be like, I appreciate it but I just need a week. Let me restart.

She continued, describing how she found support in some members of her PLC. She described a co-worker who was very positive and balanced Patricia’s negative views on her teaching as being “awesome to work with.” However, Patricia did not get that same sense of support from her PLC meetings:

I'm just thinking. I still don't know. It's March and I still can't say if I think that my experience in our PLC has been positive or negative as a big group… I still don't know if I think our PLC is a productive place for me as a teacher. I have been reflecting on that a lot lately and it can be difficult for me, doing all of this, being in a PLC, having people come watch me, initiating peer exchanges in that I naturally am much more comfortable in making myself vulnerable than I think 90% of human beings are. I'm a very emotional person and [being vulnerable] doesn't bother me. I'm struggling with [PLCs], and I think that that's a challenge for me because it's hard for me, sometimes, to relate to people that cannot [be vulnerable]. It impacts every part of what we do and how we interact, and I'm coming to terms with that.

Patricia did say, however, that she was starting to feel better about both her professional efficacy and her collaborative work with the PLC compared to the beginning of the year. She indicated that she was starting to understand that she did not share the same outlook on teaching and collaborating compared with some of her more experienced colleagues. She described herself as being very open and vulnerable, and over time she was regaining confidence in her personal approach to teaching. She considered openness to change as being one of the biggest challenges for both her PLC and for the entire school
staff. She felt there were issues with pride and protecting what is professionally comfortable for her colleagues:

Two things [limit the efficacy of the PLC], and it's that holding fast and wanting to do things the way you want to do them that causes a lot of our conflict. I've been doing a lot of thinking about it and I'm realizing that a lot of it does come down to that openness.

Patricia explained that her openness allowed her to pursue new ideas and experiment with new practices. She indicated that colleagues were not willing to try new practices for fear of failure:

I think it's a good thing that I'm very open but it does make me feel like I don't understand why [colleagues] can't just do this thing. This one thing. Yeah it makes you uncomfortable for two seconds and then it's over. If it goes poorly, whatever. The kids try stuff and it goes poorly all the time. It's not going to kill them to see an adult do that too.

James was a much more experienced teacher than Patricia, but he expressed similar feelings about the level of openness and trust within his PLC. He explained that the PLC conversations had become more open over time. However, he felt discomfort with collaborative decision making at times. He said, “I think that my colleagues have ideas that are equally important to look at because I have been the one making those choices, curricular choices, by myself for so long that it’s not a comfortable thing yet.”

When Linda was asked about how her work in PLCs has influenced her perception of professional efficacy, she stated that collaborative work brought positive changes in her teaching and in student understanding. She also stated that in her role as a PLC leader,
collaboration was also something that she often found very frustrating. Speaking of the positive aspects of PLC work, she said, “I think that I'm much more intentional, much more reflective because of it, because I've been forced to, because we do a million reflections all the time.”

Working with colleagues to gain and maintain forward momentum was a source of frustration for Linda. She described her perception of a resistance to accepting the purpose of the PLC work in some of her colleagues:

A lot of people don't know, still don't understand the why we're doing it, even though we've said it 1,000 times… Again, it would not be okay in their classroom if they told [the students] why that was the learning target we've been concentrating on this year. Then [the students] still said, “I'm not going to do it because I don't like your why.” I don't know. They still don't. It's just frustrating. It's frustrating to be in a leadership role at any time and then not always have your colleagues onboard or thinking that you're the enemy.

Linda also expressed frustration with how new ideas were discussed and inquiry was generated in the PLC. She felt that, while the inquiry process was improving over time, she was the lead driver and early adopter of any new ideas. She stated that most new ideas that the PLC discussed were things that she had found on Twitter or the internet and brought to the group.

Barbara also felt that her participation in a PLC had a positive influence on her effectiveness as a teacher. She felt that her PLC was more reflective on their instructional practices, and was more open to asking for input than they had been at the beginning of the year. However, Barbara felt the PLC lacked efficacy in data processes. She said that she had
never taken a statistics class, and was therefore worried about misinterpretations or bias in data analysis. She also did not feel that she contributed enough to the efficacy of her PLC. She said, “Sometimes I feel like I’m kind of floundering… Do I think I’m a productive member of it though? I don’t know. Some weeks maybe more than others.” Some of this perception was based on her view of the effectiveness of other PLCs in the building. She said:

I think for some people it's working really well. I know that the science teachers have multiple times commented on how well they think their PLC works and how they really are able to look at some things and delve into things that has happened within their classrooms and use it to their advantage.

Barbara summed up her perception of how the PLC has influenced her as a professional by reiterating that because of collaboration she was, “maybe being a little bit more critical of my own teaching and what I can do to improve myself.”

A second theme that emerged from discussions about perceptions of efficacy was the value of sharing expertise. The majority of the participants in the study indicated that they were a more effective teacher as a result of their experience in a PLC. However, the nature of the effectiveness was nuanced. For example, Robert’s view of the effectiveness of his PLC was more optimistic than that of Linda or Barbara. Robert felt that he and his colleagues collaborated well before the PLC process was introduced. He considered his colleagues to be experts in their field, and their support had made him a better teacher. In addition to expressing that the PLC work had a positive influence on his personal professional efficacy, Robert also felt that he contributed to the efficacy of his colleagues and his PLC. He said, “We all influence one another.” Robert described how he brought back
insight gained from working with university students to his PLC. The work outside of school helped Robert describe connections to essential learnings for the PLC. Robert expressed gratitude for his colleagues and for the way that his PLC worked together:

It needs, has to be in the place where you rely on one another. Groups that are not relying on one another are suffering. They are bearing too much weight. You know I can't remember what draft horses one can like pull 10 thousand, and two can pull almost four times the amount. You know if you do not work together, it will kill you. You know because they're asking you to do more, but whenever you start relying on one another and say, “Okay you bring this little piece, you bring this ...” Then it's not so bad.

Robert summarized the influence of his PLC on his sense of efficacy as a teacher saying, “They have just pulled me up, and it makes me better as a teacher. Iron sharpens iron.”

John described the efficacy of PLC work being inhibited by the work prescribed by district and building administration. He recalled the previous school year:

We spent a whole year repeating, repeating, repeating the same thing over and over. You know, I kind of like if we got a plan, let's go, let's move. But we spent a lot of time spinning our wheels saying the same things meeting after meeting, just saying it in different ways. We get in this habit of just finding the fanciest phrases we can and throwing them in there and making it sound like it's new, all right? I'm very common sense person, you know, and as you can tell, I'm a very if we're going to do something let's do it, and let's talk about how we're going to do it.
John said that when given time to discuss instruction and assessment, the PLC process was beneficial to his colleagues and him. He did not feel that they were given the opportunity for those conversations often enough.

For teachers who had assumed a leadership role in their PLC or in the building, that role influenced their perception of both personal and collaborative efficacy. Linda did not view herself as effective in helping colleagues she considered to be resistant to begin to embrace collaboration. She asked, “Why are adults okay with being the worst student in the room when they are a teacher?” She did feel effective in supporting colleagues who were more open to collaboration. Linda enlisted other colleagues to help with the PLC leadership, including contributing to agenda items, taking meeting notes, and even leading meetings. The distributed leadership helped the PLC in her opinion. She elaborated:

I felt like the first couple of years that I owned the PLC so they didn't know any better. I would sit there (front of the room) and they would sit here (middle of the room) and so it was more like, “This is something she's making us do. She just came here a couple of years ago and this came with her. Now we're being forced to do it the way she wants to do it.”

Linda felt that her experience as a PLC leader made her much more reflective as a facilitator as well as a teacher.

Mary felt that the leadership of her PLC had a positive influence on the PLC’s effectiveness. She defined the effectiveness of the leader, describing that the leader had clarity on what had been accomplished in the past and what needed to be accomplished at the meeting. The leader helped the PLC establish norms for behavior, and the PLC was willing
to hold one another accountable for following the norms. While the meetings were focused, Mary felt that ultimately the team followed the path dictated by student data.

**Research Question 3: Influence of external supports and constraints on the inquiry stance of the PLC**

Two themes emerged when participants were asked to describe the influence of external supports on the inquiry stance of their PLC:

1. Teachers experienced the district providing support for collaboration through the resources of time and professional development.
2. Teachers described building and district administrators as committed to collaboration.

Four themes emerged when participants were asked to describe the influence of constraints on the inquiry stance of the PLC:

1. Teachers described concern about accountability to expectations.
2. Teachers experienced a lack of time to engage in collaboration.
3. Teachers experienced the make-up of their PLC and the master schedule as barriers to collaboration.
4. Teachers experienced their colleagues as resistant to change.

Previous research has indicated that behaviors such as reflection on student-learning data, when approached with teacher learning in mind, may result in teachers who perceive an increased level of professionalism and a greater sense of efficacy (Hoyle, 1982; S. Y. Kennedy & Smith, 2013). The participants reflected on the efficacy of their collaborative team, the ways in which they perceived their collaboration was supported by the school system and context, and the ways in which they felt their collaboration was constrained by the school system and context.
Supports for collaboration. Participants described several factors that they experienced as support for inquiry through collaboration and specifically supports for using student-learning data for making decisions. The supports included district-wide structures, support for teachers experiencing conferences and professional development outside of the district, building-level professional development, a district-wide commitment to the PLC process, and specific supports from the building administration. Each of the participants in the study spoke to at least some degree of support they experienced in their collaborative work.

Teachers experienced the district providing support for collaboration through district resources and professional development. During observations of PLC meetings and in interviews with individual teachers, it was obvious to the researcher that the district had built structures and supports for teachers with the intent of supporting PLC work. There were posters in classrooms and offices that graphically depicted components of PLC work with specific focus on the DuFour questions: What do we want students to know and understand? How will we know if the students have learned? What do we do if the students have not learned? What do we do if the students have already learned? The district included a 5th question that was positioned between the DuFour first and second question: How do we instruct? Participants indicated that the ideas depicted on the posters were often referenced in meetings, agendas, and emails. Teachers in PLC meetings were observed to use the language on the posters in the course of their collaborative work.

During PLC observations and through interviews it became clear that Google Docs were used widely for both sharing information as well as for collecting information. Teachers used their computers during PLC meetings and referenced the contents of common
documents. When questions arose during PLC meetings, it was common for a teacher to suggest a search for a Google Doc for the answer. Participants spoke to keeping meeting notes in the agenda and the fact that administrators and coaches often reviewed the information on PLC Google Docs. Mary described the way that the district structures support her PLC work:

> We come in with an agenda, we come in knowing each time what we've accomplished and what we need to still work on. So, I think that that's the key to the structure of our PLC. We have norms that are set, so we know where to stay on base and focus on.

James described a process where his PLC had been dependent upon administration or coaches to determine the contents of the PLC agenda but had evolved to a place where the PLC was determining the direction of their work. He said, “We said, ‘We don’t need the curriculum director to take us to the next step because it’s all in this PowerPoint, and we’ve all looked at it, we all know what the next step is.’”

Participants experienced their school as being invested in providing opportunities for teachers to attend conferences and outside of district professional development. Specifically, the opportunity to attend a summer PLC conference was cited by several participants as a turning point in both their personal understanding of PLC work and their colleagues’ buy-in to the PLC process. For example, Linda described not really buying into the PLC process until she attended the conference. She said that at the conference “things really became clear to me.” James described how his PLC was initially a group of people who came together for short periods of time but worked in isolation. As more members of his PLC attended the conference, he perceived an increase in collaboration and interdependence within the PLC.
The district supported teachers’ attendance at the PLC conference for several years. However, Linda recognized a distinct change with the new administration in that they attended the conference with the teachers. She indicated that she felt that the lack of attendance by past administrators demonstrated a lack of commitment to the PLC process, which allowed a degree of comfort for teachers who she considered to be resistant to the PLC work. She said that the new administrators attending the conference showed that the administrators were, “now actually on our side.”

Barbara recalled that the PLC conference caused her to think of things in ways that she had not thought of before. She pointed specifically to the ideas of the function of homework for students and the importance of assessment. She did say, however, that while she learned a lot from the conference, she still did not feel that she knew how exactly to implement the learning.

Robert described administrators inviting specific teachers to attend a conference on response to intervention that was put on by Solution Tree, the company that publishes the DuFour books, in an effort to convince some reticent teachers to become more receptive to the collaborative process. He said that the administration identified PLCs that were more resistant to the work and strategically invited members to travel to the conference, based on the positive response of other teachers who had recently attended.

In addition to providing opportunities for teachers to attend PLC conferences, the district also provided the opportunity to visit other school districts so that teachers could engage in learning through observations and conversations with teachers from other districts. The district called this experience an innovation day. John commented that he felt that the district and building administration prioritized providing opportunities for teachers to
experience learning outside of the district, and he found the visit to be beneficial for him and
for his team. James described how the learning from the innovation day influenced his
PLC’s work:

Yes, that was a professional development day provided by our school district, it was
called the Innovation Day, and we could choose to go wherever we wanted to and we
could go alone, or with others, we could reach out and say, “Hey, can we come?
Would it be okay for us to come and observe that?” It was after that, that the
conversations were more serious and more focused on, “Let’s move, let’s not just sit.
Let’s not just stay where we've been, let’s make something really cool happen for the
kids.”

James stated that while the team learned from observing colleagues in other schools, the team
also felt affirmed in the work that they had already accomplished in their PLC. Robert
described how the Innovation Day came to be:

I'm part of the calendar team, and last year [the superintendent] brought up something
about going out and visiting other schools. So, we decided on a calendar committee
team. We were going to put that on the schedule. So, this last year as a science team,
we went and visited [a nearby school district]. We spent all day there and looked in
all their different science rooms. What they're doing, how they're doing things, and
then afterward met and talked about what does that mean for us? How can we
change? We also felt really good about where we are at because they were doing a
lot of the things we were doing. We saw a lot of commonality so we were like,
“We're on the same kind of boat and we're moving in the same direction as them.”
So, it made us feel good. We'll have another one next year where we get to go visit.
In addition to providing opportunities for teachers to travel to PLC conferences, the district also dedicated professional development time to the PLC process. Elizabeth believed that the district invested in the professional development because PLC work is a non-negotiable for teachers:

The district has brought in lots of PLC training because this is a big push for us. It's non-negotiable. If you want to work here you will be in a PLC and we will find a way to make it successful for you… It has not been easy for some of the longer time employees to accept, which is understandable. Change is hard.

Patricia agreed with Elizabeth, saying that in all of the large-group staff meetings, the teachers talked about PLCs. She indicated that large-group professional development provided examples of how to implement PLC work and how to be intentional. She shared the concern, however, that the large group professional development learning was not often transferred to her PLC meetings.

The professional development was often provided by administrators and the instructional coach, but the district also brought experts in to engage the staff in learning. One such visit occurred the day before one of John’s interviews. He had a positive impression about the speaker’s presentation, but did not feel that he learned a lot of new information:

Like yesterday we had an in-service day, which is really about the PLC. We had a speaker come in. Very good speaker. He was real good, and there was some things the he enlightened us on, stuff like that.

John indicated that the speaker was from Solution Tree, the company that puts on the summer PLC conferences and publishes the DuFour books. John felt that the speaker
reinforced the important aspects of PLC work that were on the district posters and had been discussed in prior professional development sessions. His opinion of the speaker was much more positive than his impression of most of the professional development he experienced:

Yeah, it's the larger group, like the whole high school. They'll meet, and we're just listening to somebody who went and saw something, showing a slide, doing this or that, and it's like going to a convention or something. You're just sitting and you're listening, and I would wish ... See, it's my opinion that the experts are the ones sitting there listening, right?

Robert had a different interpretation of the effect that the speaker had on the staff. He described the speaker as affirming those who believed in and support the PLC work. He didn’t, however, feel that the speaker was effective in moving teachers who questioned the value of collaboration toward PLCs. He indicated that many of the questions for the speaker came from the “unbelievers” who asked different versions of the question, “What is your whole purpose?” Others asked about how to implement the PLC process when most teachers teach singleton courses. The speaker suggested collaboration with other schools. Robert felt that the answer supported teachers who were resistant to the change of the schedule to allow for more collaboration on courses.

The new administration changed the way that building professional development was delivered during the 2016-2017 school year. Prior to the 2016-2017 school year, the teachers experienced professional development in a setting in which all of the teachers were together, and experienced the same learning. During the 2016-2017 school year, the teachers were often divided into smaller groups and experienced more differentiated learning. The groups were made up of teachers from different departments and content areas, and therefore
different PLCs. Robert said the change came about because in the large group some teachers would not speak up, but they would share thoughts and feelings in smaller groups. He described his experience:

Rather than doing a large group, it's a small group of 8 to 10 teachers, which I think works out a lot better. That’s exactly what’s going on in those meetings is, “Here’s where we’re going.” “What questions do you have?” It’s just really trying to paint the picture every single time for the people who are in there, and also solicit feedback.

The differentiated professional development was experienced by Robert as an opportunity to develop shared learning with colleagues that was specific to the needs of the small group of teachers.

**Teachers described administrators as committed to collaboration.** Participants described the new administration as supporting PLC work beyond changes in the delivery of professional development. According to the participants, the principals often referred to the “big ideas” indicated on the building posters when communicating with teachers. Barbara reported:

As a reminder, every once in a while, I'll get an email from our principal, “What do we want our students to know? How will we teach them?” All that stuff that's right there in front of us, they just reinforce and reiterate constantly, we need to be reevaluating ourselves, how we're teaching, what we're teaching, why we're teaching the way we're teaching, what can we do to be a better teacher.

Barbara interpreted these emails as a support for her to continue to inquire into new methods to improve instruction as well as support to improve collaboration. Barbara did not interpret
the emails as a statement that she was not meeting expectations. She found the emails to be helpful reminders of what the school was working toward and why her work was important.

Several participants discussed their appreciation for the intensity they perceived on the part of the principals in working to understand the teachers, the PLCs, and the school culture during their first year at the school. Patricia described how both principals spent a significant amount of time in her classroom over the course of the year to observe classroom operations and to provide feedback on instruction. Patricia said that the number of observations and the amount of feedback at times seemed overwhelming, but upon reflection she realized that the principals were simply trying to get to know the school.

One way in which the administrators got to know the school was through short classroom visits and walkthroughs. Barbara said that a principal had been in her classroom more in the first term of the school year than in the two previous years combined. She experienced the classroom visits as a walk through that lasted a few minutes. After the walk through, she would receive some feedback on what the principal had observed. Prior to the 2016-2017 school year, such experiences of feedback never happened.

Linda appreciated the time that the new principals spent getting to know her and working with her to improve teaching. She indicated that she spent a lot of time in conversations with principals discussing how she viewed herself as a teacher. She said, “We've spent a lot of time talking about that this year. What is your why? What do you want? Do you really want all students [to learn] or is that just something that you're saying?” She acknowledged that these conversations have been difficult for colleagues, but she appreciated the opportunity to reflect.
Similar to Barbara and Linda, Elizabeth experienced administrative support as a desire on the part of the principals to learn about the school and the teachers. She felt that the desire to learn was a model for building a culture of learning and inquiry in the school. She said:

We've had an administration shift and a shift that has gradually happened, culturally and within our PLCs and what our expectations are as faculty members. We've done a lot of learning as faculty in the last year. The last productive and successful collaboration happened before the more successful collaborations happening currently. As I've grown and learned as a professional and have had different expectations from my supervisors, that has certainly facilitated more positive collaboration.

Elizabeth said that while there was not anything inherently wrong with the structure for collaboration before the new administration, in her view it was not effective. The change in administration announced that it was time for change in the collaborative culture as well. Elizabeth was impressed with the way that the new administration had dealt with the “whole host of issues and a whole culture and environment” over the course of the year. She reflected on how the administration change had influenced her learning, “[I]n some ways, it's each of us are exploring different things because that's the thing we need to explore wherever we are in our practice. I think this year the why has been much more explicit coming down from the top.”

While all participants described the new administrators as having a different approach to PLC work compared to the past administration, some provided context as to why the new approach was welcomed. Robert described the previous principal as having the attitude of
“I’m done.” Robert felt he just wanted to be left alone. Robert participated on the interview committee for the new principal. He described his initial impression:

I was on the hiring committee, and [it was important] they knew about the PLCs.

That they knew about Marzano. That they knew about all these, DuFour, all these things everybody's kind of going towards. That they were well entrenched, well versed in that and they are, and because of such, it's been a push this year to go in that, where the last three years or so, because administration wasn't part of it, it was like, “Okay what hoops do we need to jump through?” It was more hoops rather than, this works. We're going down this direction.

Robert said that this year there was a real push to improve PLCs. He said, “This year we’re going in this direction. This is what we’re going to do, and we’ve lost people. We’ve lost several people because of it.” Robert acknowledged the toll that the push had had on the teachers, specifically those that had not bought into the PLC process. He said, “When the pinky hurts, the whole body knows the pinky hurts.” Robert felt that the administration responded to the pinky hurting by offering additional opportunities for learning. Robert characterized the response, “More knowledge. More people coming in. More going out and watching other people. Getting inundated about, “We are not in the '80s anymore.” He concluded, “I love our new administration. I can’t say it enough.”

The push described by Elizabeth and Robert was experienced as increased accountability by several participants. James experienced an expectation of accountability for each member of the PLC to participate in conversations. In the past he had experienced colleagues bringing papers to grade or other paperwork to meetings and therefore a large
degree of disengagement. Linda expressed frustration that the accountability had not changed her PLC as much as she hoped. She said:

One of my bosses, the teacher-leader-coordinator, she's going to be in our Google Docs today, I'm sure, and she'll see that... last data, August. This stresses me out. It's just really hard for me to understand the entire school culture - how things that would not be okay for your students are acceptable behavior for you. It wouldn't be okay for you in a group situation to have two people checked out, or have you checked out just as yourself, to be checked out or not be contributing or be off task.

John also felt that the accountability had not significantly changed his PLC. He acknowledged that there was a push toward more collaboration, and he acknowledged that data was collected on the PLC work. However, he said, “Everything that we do gets sent in all across the district, and it gets evaluated, and then what they do with it from there I don’t know.” His PLC did not receive feedback on their work.

An additional level of accountability introduced in the 2016-2017 school year was peer coaching. Barbara said:

They push peer coaching more, especially this last term. They want us to go two times before the end of the year to visit people and have two people come into our classrooms if they can, to have us be viewed as well and just get some feedback. I just got a follow up email on that myself so they're trying to keep us accountable.

Barbara felt that all of the aspects of accountability were focused on helping teachers experience improved efficacy, both individually and collaboratively. She felt the principals wanted all of the work to be beneficial and that they wanted to make sure that teachers had the knowledge and strategies to implement the learning.
Barriers to collaborative inquiry. The participants described what they perceived as barriers to the effectiveness of their PLCs, specifically in their efforts to use student-learning data. Several topics emerged when participants were asked to describe factors that limited the effectiveness of the participant as a teacher and as a member of a professional learning community. Factors that were perceived as barriers included time to complete work and having enough time to meet collaboratively, the way that teachers were grouped into PLCs, the master schedule for the school, and what was described as resistance to change on the part of a portion of the teaching staff.

Teachers described concern over accountability to expectations. Time invested in completing assigned agenda items and filling out forms and documentation competed with the investment of time in the analysis of student-learning data, according to participant responses. John said, “We are a lot of times given nonsensical type of stuff to do that pulls us away from [data]... We're supposed to fill this form out… We're supposed to do just what I call busy work that takes us away from progress.” He considered much of the time spent on clarifying essential learning to be time that could have or should have been spent talking about student learning and instruction:

We work so much on the essentials because we have to turn [in our work]. It's the stuff that we have to turn in, the stuff that we have to document, [to] put on the docs and turn in, [that] we spend a whole lot of time on. Quite frankly, back to my personality, we spend way too much time on doing that. We try to find all the right words and all the right phrasings, and we spend way too much time on the terminology of everything and concepts. We just don't spend enough time just saying, “Tell me how you teach this? Tell me how you do this.”
John felt that much more could be accomplished if his PLC had more time to listen to one another and learn from the shared experience. He acknowledged that there was not time in the day for his colleagues to observe other classrooms, “but just listening to what everybody does would go a long ways, and we don’t do near enough of that.”

Some of the time was spent trying to interpret what the agenda asked PLCs to accomplish at each meeting. Mary said, “I think we first sit down and get the clarity of what are we really tackling here. And then sometimes we don't know exactly what the clarity is, so then we're asking for some clarification on what it is. Or maybe then sharing what we all think whatever it's supposed to be.” James described waiting for clarity and direction from the instructional coach. He and another member of the PLC eventually decided to move on with their work on their own. He said, “The next step is, if we're waiting for somebody to push us off our lily pad or whatever, to jump into the pond and swim, we just have to do it.”

**Teachers experienced a lack of time for collaboration.** Barbara experienced time as a constraint to bringing student data to the PLC on a regular basis. She said that her PLC wanted to use student-learning data as a basis for discussion on instructional practices, but the team struggled to bring data to meetings and struggled to hold members accountable to bringing data. Barbara did not feel that she had time during the day to do all of the teaching on her schedule and get student work prepared for PLC meetings.

The utilization and organization of Google Docs for PLC documentation was an observed barrier to efficient use of time in several PLC meetings. I was able to observe confusion over the specific document that was being discussed in multiple meetings. It appeared that several documents had similar names, which made it difficult for teachers to differentiate the correct document from the incorrect document. Once the name of the
document was determined, some members still struggled with the technology to find the correct document.

In addition to feeling as if there was not enough time during PLC time to get through the work on the agenda, teachers also reported that they would be more effective if there was a common planning time for PLCs beyond the Wednesday morning professional development schedule. PLC time was scheduled for each PLC for an hour on most Wednesday mornings of the school year. However, there were several weeks where other professional development or curriculum meetings were scheduled instead of PLC time. Mary said that while her PLC functioned at a high level, she struggled to meet with the teachers she needed to see on a daily basis. She said, “I feel like I spend most of my time emailing teachers because I can't get out into the classroom and talk to them during their planning.” Patricia had a common planning period with a teacher who taught the same course during the first semester, but due to the master schedule for the school they were not able to keep the common planning period for the second semester. She said she and the other teacher needed to rely on Google Docs and “fifteen minutes here and fifteen minutes there” to collaborate during the second semester.

**The make-up of PLCs and the master schedule were considered barriers to collaboration.** Most of the teachers at Elberon High School were either the only teacher that taught their courses or were one of a very small number of teachers, most often two, who taught the same courses. This design of the master schedule presented a barrier to the use of student-learning data in PLCs because PLCs were most often structured around departments rather than specific courses. This structure meant that there was rarely data from common assessments over common content, skills, and instruction. The participants recognized this
structure as a barrier to PLCs and the master schedule as a barrier to the ultimate efficacy of their PLC work. For example, Patricia said:

- I don't think that there are many departments where two teachers teach the same class.
- I think we're all pretty much doing our own thing in our own space and then coming together to have those big conversations as PLCs. I can see that the PLC model doesn't fit when you have four English teachers and they teach 9, 10, 11, 12. That doesn't make any sense other than making sure you're vertically aligned.

Barbara’s PLC extended from elementary general music to high school courses. The span of grade levels and content, and therefore the necessary differences in assessments for each grade level, made it very difficult for the PLC members to discuss student data. Barbara reported that her PLC struggled to develop an assessment that allowed for the PLC to authentically enter into data discussions:

- The biggest thing that I think is missing is the assessment. Then, on top of that, once I have that, who am I supposed to compare it to? How am I supposed to compare this to elementary, general music, if she's doing some sort of assessment? Let's say we say our biggest standard that we're focusing on right now is rhythm. How do I assess my rhythm to 5th grade general music? I feel like that's our biggest issue.

This concern was shared by participants whose PLC was high school only as well. While Patricia’s PLC was high school only, she reported concerns about the implementation, results, and analysis of common assessments:

- The only data that I feel like we have collected as a PLC was because we had to, and we haven't done anything with it. We made some formatives and not everyone gave
them. It's just kind of in a Google Doc, and we haven't looked at it since we entered it.

Barbara described one of the barriers for her PLC was the amount of time between scheduled PLC meetings and the lack of common planning time for the teachers in the PLC to meet outside of the scheduled PLC time. She initially described efforts to change the schedule as a solution to this problem. However, she also described the change as a complex puzzle, saying, “That's something that they're actually trying to figure out for the schedule for next year, and they're running into major problems trying to figure out how they're going to have everybody in the same PLC have the same planning time.”

Participants expressed concern over the authenticity of PLCs, due to the size of the school limiting the number of courses taught in multiple sections by multiple teachers. Elizabeth said that the nature of the master schedule led to her only collaborating with another teacher on a common course sporadically. She said:

It's one of the joys and concerns about a mid-sized school because so often you are the only teacher for that subject. It makes collaboration difficult. I've been lucky here to be often the one who is, “Sure, take a couple sections of this,” and, “Sure, I'll take a couple sections of that.” I wind up collaborating with somebody because I got thrown into the course and I need to know what I'm teaching. I've had experiences where collaboration had been really successful because both of us were in it from the beginning. I've had experiences where collaboration has not been as successful because the root reason for collaborating was not the same.

The current master schedule was also a concern for Linda. She indicated that there had been a lot of sometimes emotional conversations in the school about how to move toward more
authenticity in collaboration in ways that would be meaningful to teachers. Ultimately, she acknowledged an understanding of how collaboration might be improved with more common courses for teachers, but she remained concerned about the disruption that a change in the master schedule might cause.

Not all of the participants expressed concern about the potential change in the schedule. Robert was pragmatic about the master schedule for 2017-2018. He explained that most of the PLC research that he was familiar with was written with larger school districts in mind. He reported that he had brainstormed ways to collaborate on singleton courses, but he had not found a workable solution. He reached out to neighboring school districts to see if the administration would support collaboration on common courses between schools, but never received any responses back. He said that his PLC would simply have to figure out the singleton problem on their own.

All of the participants spoke to a general understanding that the school administration recognized that the school’s master schedule, both in the time dedicated to PLC work and the way that teachers were assigned to courses was a barrier to PLC work. The participants also spoke about discussions taking place about restructuring the master schedule to address the concerns for future school years. Some of this discussion was described as meetings with administration and the instructional coach. Participants also discussed rumors and teacher concern about the restructuring. The personal responses from the participants ranged from optimism to deep concern.

The optimism expressed for the change in schedule emerged from the recognition of the barriers that teachers described in the current PLC structure and master schedule. For example, Mary sounded optimistic when she spoke of the administration looking for ways to
allow for more time for collaboration and common planning time for teachers. However, she was the only participant who did not bring up concerns over the change.

Linda described experiencing the potential for change in the master schedule with an understanding of why the change might be necessary in order to provide opportunities for increased collaboration, saying, “It's tough to collaborate for nine through twelve electives and non-electives, like we've been just working on things that we could do all together. We could develop scoring guides and stuff like that, but not day-to-day stuff.” However, she immediately went on to describe her perception of resistance on the part of teachers to the change because of the disruption to the schedule that will be necessary in order to facilitate the common planning times and common courses. Linda acknowledges that some departments and PLCs are ready for the change, while others, including her own, were not comfortable with the change:

Other departments, it will be a little bit easier and they're already doing it. There's three or four teachers that are teaching Algebra one now, because they're more freed up in their schedule. Science, the same thing. There's three or four teachers that are teaching, like basic biology. The history department is not at all. They're very isolated like we are, and it's not because of college courses, it's just because that's what they want to do.

Linda also described her personal concerns about what the change might mean for the courses that she taught and the amount of work that will be required by the change. She taught many singleton courses and pursued a graduate degree that allowed her to teach courses for college credit. Adding a core grade-level course would require her to prepare for a course and content that she had not previously taught, while continuing to teach the
singletons, because she was the only teacher certified to teach for college credit. She also voiced concern that she and her colleagues were hired with the intent of teaching specific courses. She felt that she was hired to teach upper level courses and should be allowed to continue to do so, much like her colleagues were hired to teach lower level courses. She was so upset about the possibility of teaching 9th grade courses that she contemplated leaving the district, and she made it clear to her administrators that she was considering leaving. Linda’s responses demonstrated the tension between her desire for effective collaboration and her desire for autonomy. She described concern over how decisions that will impact her were being made.

Linda reported that she had participated in many conversations with the building administration about the possible change in the master schedule, and she felt like they listened to her concerns. She was also concerned about some of the language that was being used to communicate the possible change. She said that she felt that it was being communicated that any teacher could be dropped into a course. In her view, that meant that the teacher was not important. She felt the language made teachers feel “completely replaceable” and that the school could operate like a factory. She elaborated about the possibility of teaching a course that she did not want to teach:

I don't want to. I don't have any desire. I like the classes that I'm teaching. I feel like that you went to school probably for your Masters in being a principal or in special education, and then somebody would come to you and say, "Guess what? I want you to take a class today. I want you to take this terrible class because I think," and then try and frame that like, “Because you're a great teacher.” To me, that's a punishment.
Patricia expressed similar concerns about being asked to teach courses that would be different from the courses that she currently taught, even if it would allow for collaboration around a common course. She spoke to taking her current job specifically because of the grade level that she was asked to teach. She did express a degree of trust in the administration and the system of making decisions, however. She expressed a belief that the principal would come to the PLC and ask for input on ideas before any final decisions would be made about the schedule for the next school year.

Unlike Linda and Patricia, Robert explained that he personally did not see the change in master schedule as a negative. However, he described in great detail the level of resistance that he perceived in the school to the change. He began by describing how the change would impact him personally. During the 2016-2017 school year he taught two courses a day, and thus, during his planning time he prepared for two courses. In the proposed new schedule, he would add a third course that would include a common planning period with another teacher that teaches the third course as well. He would therefore add a course to plan for each day and would also move from having time to plan for courses on his own each day to a time for planning in collaboration each day.

Robert acknowledged that the change in the master schedule would amount to more work for teachers; however, he felt that the benefits to the PLC would make the extra work worthwhile. He expressed concern that the teachers had been promised that no new work would be added without taking other work away. He said, “Hasn’t happened. They’ve added more. [Collaboration] is one more thing, but this one more thing has been so positive. I believe it’s so positive, and will lead us to tremendous growth.” Linda also thought that the
change in schedule would lead to more work, even if she was told otherwise. She did not see how adding a course to her schedule would not result in additional work.

Several participants voiced concerns over the way that the schedule change might take place. Linda described the decision as being “all top-down” coming from the administration. She said, “I have been very skeptical and a little resistant to it for the last two years. I totally get the value of it. I get the idea of the conversation. I just, in some ways, in some classes, it’s going to end up being very forced and artificial.” Linda acknowledged that the structure of PLCs could be improved. However, she was concerned that the proposed changes would also be problematic, and she felt that her concerns might be ignored.

**Teachers experienced their colleagues as resistant to change.** The participant discussion about the resistance and unease related to the top-down nature of the decision to change the master schedule by the administration brought about discussion of the interpretation of what Robert called the “administrative push” during the 2016-2017 school year. Patricia experienced the push as “forward momentum.” She believed that the administration would continue to replace retiring teachers and other teachers who decided to leave the district with teachers who would be supportive of collaborative work. She said, “The conversation that people have had with me is it’s going to be get on board or decide what you are going to do.”

Barbara experienced the “administrative push” as “a little bit rocking the boat” for teachers. She said, “There’s a lot of really dumb stuff that actually made me really mad, because I’ve so far this year had great support from my administrators and felt like they actually do care about what I’m doing, and they really do want us to be better teachers and really try to push ourselves.” She described hearing about meetings of resistant teachers
during the school day, and that she felt these teachers were being unprofessional and unethical. She said that she could not understand why teachers would be resistant to the vision of the new administrators. She said, “If you don’t have the students’ best interest in mind, then why are you teaching?” Through her responses, Barbara demonstrated a viewpoint that teachers who question initiatives do not want what is best for students.

Barbara explained that she felt the reason that there were small groups of teachers who were resistant to the administrative push was that the previous administration had been so different in their approach. She described the previous administration, saying, “The administrators before now, status quo, status quo. You didn’t do anything. You were just on your own, you did your own thing. You didn’t have to worry about it.” She felt that the previous administrators accepted teachers pretending to collaborate. She said, “And now there’s some accountability, and I think that pisses some people off and forces them to think about their current career.”

Barbara did feel that the number of resistant teachers was decreasing and that teachers’ mindsets were changing. She was not willing to say that all teachers were moving in the same direction, but she felt that in time they would be. Like Patricia, she felt that there were many retirements planned at the end of the 2016-2017 school year, and that the administration was hiring people who were invested in change.

James also discussed the differences between the new administrators’ approach compared to when PLCs were first introduced in the school. He said, “I can’t say that it has been a smooth ride in any stretch of the imagination. It has been one false start after another if you ask me.” He felt that the initial implementation was done in a way to attempt to make collaboration palatable for all and completely non-threatening. He did not feel like the
original implantation had an accountability because there was concern over hurt feelings or teachers feeling judged. He explained that there was an effort over the 2016-2017 school year to “bring together the influential minds and structures within the population of faculty and getting them on board first.” He felt that for the PLC process to be successful, there needed to be a consensus. He felt that a consensus would be built through, “informing people, getting them brought up to speed, and on the same page at the same time.”

John was not as optimistic about the administrative push as many of the other participants. When asked about the proposed change in the master schedule, he said, “A lot of things just happen around here. Nothing’s really explained that much, so I don’t really know why.” He explained that he had stopped attempting to provide feedback on decisions because he felt it had become a waste of time. He said, “I’m really coming across negative on this, and I don’t mean to. But in the big picture, no I’m not heard. We’re not heard.”

The participants all expressed concern about teachers they considered resistant to collaboration and the ways in which the resistance influenced the culture of the building and relationships among teachers. The participants’ responses demonstrated great concern about how or if the resistance could be resolved.

Some of the participants described a lack of teacher leadership as a barrier to the efficacy of the PLC. Linda called it “a huge cultural issue” in the school. She said that there were two PLCs in the school that do not have a leader and do not want to have a leader. She elaborated:

They don't have a leader that's, I don't know, in the know or anything. They like that, but then use it as an excuse, too. They were all resolved to be like that the last couple of years by our building leadership. It has definitely changed. They are being held
more accountable. But you still got to make somebody the positive leader in a group especially it's been too long. They've all been together for three or four years now. They're pretty safe in that. They are the rebels and they love that role.

Linda explained that two PLCs had no teachers who applied to be a leader for the 2017-2018 school year, so she was concerned about how the PLCs would move forward.

John had a different view of his PLC, which was one of the PLCs that did not have a designated teacher leader. He acknowledged that there was supposed to be a teacher leader, but the past leader had left the district a year before, and none of the rest of the members of the PLC were interested in taking on the role. He recalled that instead of designating a leader, “We just all agreed that we trusted that we’ll just take care of ourselves. Really there is no leader in our group right now, but we all participate and we all talk. It’s very open. We are not afraid to say anything to each other.” He did not describe the lack of teacher leadership as an act of resistance to school expectations.

Each of the participants described resistance to change as a barrier to the efficacy of PLC work. Patricia described a “swift current of negativity” down the hallway from her classroom that she did her best to avoid. She explained that she found a few teachers both in her PLC and outside of the PLC that she felt were supportive and optimistic, and that she tried to spend most of her time with the optimists. When she was not with the optimists, she “does her own thing.” Patricia felt that there were “four or five voices” in the school who were the most resistant to change. She explained that initially she thought that there were more resistant teachers than was actually the case. She said it took her a while to figure out that while the four or five voices were very loud, there were only four or five of them.
Linda felt that the teaching staff was divided in half between those who are interested in new learning and those who are fixed in their ways. She felt that while they might not actively oppose the district vision for PLC implementation, they were not actively pursuing any new knowledge either. She said:

There's still very much a mindset that if we're giving you new stuff, then we're saying that your old stuff was bad. It's shrinking, the numbers today. I've seen it shrinking since I've been here, but that's a real roadblock to everything that we do. Trying to continuously explain that we're not saying that it was bad, we're just saying that there's better.

She explained that she felt it would not be acceptable for a doctor to practice the same way for twenty years and ignore new methods and research. She could not understand why some of her colleagues approached teaching that way. She acknowledged that some colleagues who did not view collaboration as a worthwhile endeavor, decided to leave the district.

Linda also described the personal effects of trying to lead her colleagues toward a more collaborative culture. She said that she has lost good friends over the initiatives that she worked to lead.

James also commented on the choice that teachers who are resistant to the changes must make. He explained that he had learned that change happens in one of two ways. He said, “Either the administrator decides to stop backing that and expecting that, or they continue to expect it, and the teacher decides ‘This isn’t for me.’” In James’s view, once the teacher decides that the vision for the building or district is not for them, they must find something else to do or find a teaching job at a different school.
Robert described what he called a “resistance” that existed in the school. He felt that some teams were divided in their outlook on the change while other teams were united in their opposition:

Resistance. We all hate change. Whenever it gets down to it, I mean we don't want to change. We do the same thing every ... that's what we're used to and we're comfortable with and we don't want to ... and I say the majority of the high school is that way. Human beings. Human beings. Human beings in general. I don't know. I don't care what line of work, all the jobs I've had, whenever we change it's a whole bunch of bitching, followed by everybody does it and then, “Oh my gosh it wasn't as bad as we thought.”

Robert attributed some of the resistance to the change in administration and the leadership’s efforts to improve collaboration and the effectiveness of PLCs. He said, “There is a push this year.” The result of the push, according to Robert, was that some teachers decided to leave the school.

They just don't want to change. They do not want to change, so some saw the writing on the wall. They retired last year. Others are going to retire this year. We had one guy leave here about two weeks ago. Yeah, so we've had a lot of turnover. We've had factions, if you will. There's 3/4 of the high school who are on board and 1/4 who have taught for a really long time. They don't want to change and they've met outside of school and tried ... Yeah, it's been ... It's the gangs of New York. Yes. It really is in that aspect. There's many of us who see the benefit of it, who want to move on and there's those that are like, “I've been teaching this way since the '80s, it's
worked. Why change?” Right? “You're just asking me to do more.” Yeah, it is more work.

Similar to many of the participants, Robert recounted a situation in which the resistance to change resulted in a teacher deciding to leave the district. He said that he knew of a teacher in one of the more resistant PLCs saying, “I’m not going to do any of this. I’m done. I’m tired of this.” Robert felt that having resistant teachers leave the building has had a positive effect on the efficacy of the PLC because the majority of teachers in the PLC are supportive of the district vision. Robert summarized his outlook on resistant teachers:

They will either change or go away, and that’s fine with me. If we have turnover, oh well. I said that to a bunch of people last year in one of our last meetings, and I got some strange looks because I said, “What they’re saying to you is either change or go away. What I’m saying is change or go away. It's just not for you if this isn't where you want to go. If you can see the big picture, in the end, our students are going to be so much better.”

When asked about resistance to collaboration, Patricia stated that she had to be careful when talking about it, because it would be easy for people to become negative when they are surrounded by negativity. She expressed a belief that there was not a teacher in the school who intends to stay at the school who is resistant to collaboration. She said that the resistant teachers who were either contemplating leaving the school or retiring from teaching were waiting for the educational pendulum to swing back toward teacher autonomy. She also considered some of the resistance as stemming from a desire to see the process “work” before completely adopting the practices.
Summary

This chapter examined the findings from interviews, PLC meeting observations, and PLC document analysis. The first research question explored how participants make meaning of the epistemological and dialogic aspects of their PLC’s inquiry stance toward student data. The participants in the study interpreted the focus of their PLC work to be the discussion, creation, and revision of student learning goals aligned to the Common Core. When student data was analyzed, the participants experienced their colleagues using the data as a means to prove the effectiveness of past instruction and to identify broad generalizations and trends about student understanding. These responses align with what Nelson and colleagues call a proving stance toward student data (2012).

The participants described the primary focus of PLC dialogue to be the completion of tasks suggested by the meeting’s agenda, which led to questions that arose through PLC work to often be described as procedural. When student learning data was discussed during PLC meetings, the participants experienced the data to often be anecdotal or absent rather than being distributed or shared with the rest of the PLC. The participants interpreted their colleagues to have fixed knowledge and beliefs about teaching and collaboration. The interpretation of fixed beliefs led to social interactions that were characterized as being congenial. The participants described themselves and their colleagues as not wanting to hurt the feelings or offend their colleagues. These responses align with what Nelson and colleagues call dialogue that is not negotiation (2012). The proving epistemological stance and the not negotiation dialogic stance will be explored in Chapter 5.

The second research question explored how teachers interpret their personal stance toward inquiry with that of their PLC. Teachers reported that they experience their personal
stance toward inquiry differently than they experience the collaborative stance. The difference was attributed to the perception of different approaches to the nature of knowledge, particularly knowledge from expert sources and knowledge gained through experience in the classroom. The participant responses aligned with Cochran-Smith and Lytle’s framework of knowledge-for-practice, knowledge-in-practice, and knowledge-of-practice. The participants described an emphasis on knowledge-in-practice, or experiential knowledge, within the school.

The third research question asked participants about their experience of supports and constraints on their PLC’s inquiry stance. The participant responses indicated that they experienced support through scheduling and professional development for PLC work. However, the participants also experienced the structure of the master schedule and the makeup of PLCs as a barrier to PLC work. Finally, the participants indicated that a group of teachers who were resistant to collaborative work was a barrier to PLC work.
CHAPTER 5. DISCUSSION

This chapter contains discussion of the theoretical significance of the findings in this research, including connections to the conceptual frameworks that shaped it. Next, the findings of the three research questions will be examined and connected to the literature on teacher collaboration and data processes. The section following the discussion of the research questions includes implications for administrators who seek to implement or strengthen collaboration among teachers, for teachers either beginning to work in PLCs or wishing to strengthen collaboration, and for administrator and teacher preparation programs. Finally, this chapter contains recommendations for further research.

Theoretical Significance

The purpose of this study was to build upon previous research and to develop an understanding of how teachers interpret their experience in professional learning communities, with a focus on teachers’ experiences with collaborative interactions around student-learning data. This case study drew upon the concept of inquiry as stance, which is the “positions teachers and others who work together in inquiry communities take toward knowledge, its relationships to practice, and the purposes of schooling” (Cochran-Smith et al., 2001, p. 49). A two-dimensional conceptual framework, developed by Nelson, Slavit, and Deuel (2012) on the inquiry stance that teachers in professional learning communities take toward student-learning data framed the study.

Relationship Between Individual Stance and Group Stance. Significant alignment exists between the improving epistemological stance, the dialogic stance characterized as sustained negotiation, and the knowledge-of-practice image of knowledge and practice. In an improving stance, teachers rethink practice, generate new questions, and
findings generate new questions. During sustained negotiation, critical alternatives are pursued, new hypotheses are generated, and knowledge and beliefs are questioned and reexamined. The concept of knowledge-of-practice indicates that all teachers generate knowledge by making their school and classroom context a site for inquiry and critically examining theory and practice (Cochran-Smith & Lytle, 1999; Nelson et al., 2012). In both the work of Nelson and colleagues and Cochran-Smith and Lytle, teachers engage in the critical examination of knowledge and practice through collaborative inquiry.

In the development of their conceptual framework, Nelson and colleagues decided to foreground the group as a unit of analysis rather than the individual, while acknowledging the constant tension and interplay between the group and the individual. The decision to foreground the group stance was made because the authors were interested in the interactions between members of a group as evidence of a stance toward inquiry and because in their research they found that the collective experience was the most valuable means of identifying needs and supporting change in a PLC. Nelson and colleagues were careful to point out that it was impossible to exclude individual experience when foregrounding the experience of the community. The authors also acknowledged that individuals possess their own stance toward data and suggested that the individual stance is an area for further research (Nelson et al., 2012).

In contrast, this case study foregrounded the interpretations that individual teachers make from their collaborative experiences around student-learning data in PLCs. This case study does not exclude the group experience, but focuses on the individual lived experience of teachers. Lave and Wenger (1991) wrote that participation in a social situation “suggests a very explicit focus on the person, but as a person in the world, as a member of a sociocultural
community” (p. 52). Cochran Smith and Lytle (1999) indicated that the knowledge-of-practice conception involves individual teachers critiquing their own knowledge, experiences, and beliefs. Once teachers begin to examine their own knowledge and beliefs, they are able to engage in collaborative examination of practice and the construction of new knowledge. Therefore, to understand a PLC, it is important to understand experiences of the specific people who participate in the PLC.

Similar to Nelson and colleagues, this research acknowledges the interplay and tensions between and individual’s stance toward inquiry and that of their PLC. However, this research suggests that foregrounding the individual experience in professional collaboration is essential to developing an understanding of why and how the group interactions emerge and develop within a PLC. This research also indicates that foregrounding the individual experience is essential to identifying needs and providing support to PLCs.

Epistemological Stance. The first framework of the Two Dimensions of an Inquiry Stance Toward Student-Learning Data examines the epistemological stance that members of a PLC take toward student data (Nelson et al., 2012). The framework examines the ways in which teachers link the data process to a vision of content and learning goals, the ways in which teachers link the data process to instructional practices, and the ways in which teachers link the data process to student understanding. All three components are placed on a continuum between an improving stance and a proving stance. PLCs that demonstrate a proving stance seek to prove strength in existing practice through the data process. PLCs that demonstrate an improving stance seek to discover limitations in practice through a process of student-learning analysis. Therefore, through the discovery of limitations of practice, PLCs
with an improving stance seek to better understand instruction and modify instruction (Cochran-Smith & Boston College Evidence Team, 2009; Cochran-Smith & Lytle, 1999; Nelson et al., 2012).

A comparison between the findings of this research and the Epistemological Stance Toward Student-Learning Data Framework aligned teachers’ experiences in each of the three components of the framework as well as on the continuum Nelson and colleagues describe between an improving stance and a proving stance. Many of the participants’ responses were teaching-focused, aligned with a proving stance in that teachers were interested in connecting sub-concepts to big ideas, but responses primarily focused on past instruction, predetermined learning goals, and, despite their being structured into Professional Learning Communities, were not always informed by student learning data. All of the participants spoke of ongoing work to identify and clarify essential learnings, and much of this process involved comparing past practice to Common Core content standards.

The first component of the epistemological dimension of the inquiry stance toward student learning data developed by Nelson and colleagues (2012) is shown below in Table 3. The first component examines the links that members of a PLC make between the process of analyzing student-learning data and the content and learning goals developed for student learning. All participants discussed difficulty in using student-learning data in the process of developing content and learning goals. Participants reported a lack of common assessments, in which the members of the PLC measure a common learning goal with a common assessment tool in order to enable comparison of student learning. In nearly all cases teachers did not share their course with another teacher, which made the development of common assessments and common data analysis difficult.
Table 3

*Linking the Data Process to a Vision of Content and/or Learning Goals* (Nelson et al., 2012, p. 14)

<table>
<thead>
<tr>
<th>Stance</th>
<th>Improving</th>
<th>Moving Toward Improving</th>
<th>Moving Toward Proving</th>
<th>Proving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ perspective on student learning goals</td>
<td>Nuanced</td>
<td>Learning-Focused</td>
<td>Teaching-Focused</td>
<td>Categorical</td>
</tr>
<tr>
<td>Learning goals that link together specific sub-concepts within a big idea</td>
<td>Learning goals focused on sub-concepts that are not always linked to each other or big idea</td>
<td>Learning goals are generalizations and/or labels; some attention to sub-concepts within a big idea</td>
<td>Learning goals are generalizations and/or labels</td>
<td></td>
</tr>
<tr>
<td>Teachers’ content knowledge related to learning goals</td>
<td>Teachers’ content knowledge is composed of understandings of multiple, related sub-concepts of a big idea</td>
<td>Teachers’ content knowledge is composed of isolated sub-concepts of a big idea</td>
<td>Teachers’ content knowledge is consistent with a predetermined set of learning goals</td>
<td>Teachers’ content knowledge is reduced to a set of discrete facts, skills, and isolated statements about concepts</td>
</tr>
</tbody>
</table>

This research did, however, find evidence of teachers who perceived their PLC moving toward an improving stance through inquiry. In particular, the science PLC in this study was described as having developed learning goals that linked course-specific sub-concepts to larger concepts of scientific thinking and reasoning. The teachers in the science PLC relied on individual knowledge of course-specific concepts and collaboratively aligned the sub-concepts into understandings for students that span multiple courses and multiple grade levels. The move toward an improving stance was not described to be due to anything specific about science content or curriculum, according to the participants. Instead, the transformation in PLC work was attributed to a collective embrace of learning from one another and supporting one another.
The second component of the epistemological framework examines the links between data process and instructional practices, as shown in Table 4.

Table 4


<table>
<thead>
<tr>
<th>Stance</th>
<th>Improving</th>
<th>Moving Toward Improving</th>
<th>Moving Toward Proving</th>
<th>Proving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher Perspective on the Relationship Between Data and Practice</td>
<td>Nuanced</td>
<td>Learning-Focused</td>
<td>Teaching-Focused</td>
<td>Categorical</td>
</tr>
<tr>
<td>Purpose of the Data Process</td>
<td>Use data to rethink practice</td>
<td>Use data to improve practice</td>
<td>Use data to guide practice</td>
<td>Use data to verify effectiveness of practice</td>
</tr>
<tr>
<td>Use and Implications of Student-Learning data</td>
<td>Generate new questions, build from these questions and use data to pursue them</td>
<td>Learn from student understandings to improve teaching</td>
<td>Address questions of instruction by LASW with respect to tightly bounded answers</td>
<td>Seek confirmation about pre-existing questions related to student achievement</td>
</tr>
<tr>
<td>Use and Implications of Student-Learning data</td>
<td>Findings are the beginning; used for reflections on and changes to future practice</td>
<td>Findings are used to reflect on and change targeted aspects of instructional practice</td>
<td>Findings are used to make superficial or minimal changes to practice, or to changes targeted to generalized student populations</td>
<td>Findings are the end; used to show student learning results on past instruction</td>
</tr>
</tbody>
</table>

The responses of participants in this case aligned with what Nelson and colleagues call a proving categorical stance. In a proving categorical stance, student-learning data is used primarily to verify past instruction. When asked about how the data process influenced instructional practices, four of the participants discussed the lack of common courses and common assessments among members of the PLC, which limited the amount of time spent...
discussing data. When student-learning data was discussed, the focus was on what went well in the classroom, not how practice might be improved in the future. However, all but one of the participants expressed a desire to use the analysis of student-learning data as a way to learn about and implement successful instructional practices. Six of the participants described experiencing a sense of guardedness or defensiveness from their colleagues in their PLC which limited discussion of instructional practice, which in turn limited opportunities to learn about practice from their colleagues or identify problems of practice needing solutions.

The guardedness or defensiveness experienced by participants when discussing problems of practice was not the only barrier to changing instructional practices through collaboration. Seven of the participants described that the lack of common courses made it difficult to develop common assessments, and when common assessments were developed, the data produced was too general to spark deep discussions of instructional practice. Therefore, the participants reported that PLC’s assessment timelines and data analysis were not authentic to content and pacing of each course.

The third component of the epistemological framework examines the links between the data process and student understanding, shown below in Table 5. This research found that the participants struggled to uncover nuance in student understanding and achievement through the data process. Similar to the first two components of the framework, the lack of common courses and common assessments led to broad discussions of student achievement rather than discussion of specific student understandings on specific concepts or instructional methods used prior to the assessment.
Table 5

**Linking the Data Process to Student Understanding** (Nelson et al., 2012, p. 14)

<table>
<thead>
<tr>
<th>Nature of Data Related to Data Analysis: If Data is</th>
<th>Stance</th>
<th>Improving</th>
<th>Moving Toward Improving</th>
<th>Moving Toward Proving</th>
<th>Proving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis focuses on uncovering range and nuance of student ideas and achievement, including specific degrees of or differences in student understandings</td>
<td>Nuanced</td>
<td>Learning-Focused</td>
<td>Teaching-Focused</td>
<td>Categorical</td>
<td></td>
</tr>
<tr>
<td>Analysis uncovers range and general trends in student thinking and achievement, with emphasis on distinguishing general levels of student understanding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis uncovers trends in student achievement using refined categories, with some attention to specific student understandings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analysis highlights student achievement using broad, predetermined categories, such as “got it/don’t got it”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The participants found that in addition to needing common assessments, a common approach to grading was needed. For example, in the language arts PLC, when data from a common assessment was analyzed, the data was aggregated, and overall achievement and class averages were used to compare student learning. Without a common approach to grading or common rubrics, the comparison of averages raised questions within the PLC of the validity of the data and therefore the analysis.

Nelson and colleagues’ research (2012) indicates that when PLCs approach the analysis of student-learning data with an inquiry stance, they use the process as a way to search for nuance in student learning, as a way to generate new questions about student
learning, and to rethink future practice. The participants in this study found it difficult to achieve these goals. The process of identifying essential learnings connected course-specific sub-concepts to big ideas, but collaboration on instruction or student learning was impeded by the lack of common courses and the lack of discussion of universal instructional practices. When common assessments were developed, they often spanned multiple courses, which impeded both the timeline for assessment as well as the discussion of student-learning results due to differences in course pacing. Specifically, the language arts PLC did not indicate that they experienced successful collaborative efforts within their PLC to align course pacing or to build a common assessment calendar. The discussion of essential learning and the development of common assessments served to prove the importance of and effectiveness of past practice rather than to generate questions about how to improve practice.

Thus, all participants experienced the development of essential learnings as the focus of their PLC work. Responses indicated that when student data was discussed, their PLC tended to generalize and aggregate data rather than investigate specific student understanding.

**Dialogic Stance.** In the Dialogic Stance Toward Student-Learning Data Framework, Nelson and colleagues delineated the nature of PLC conversations on a continuum between negotiation and not negotiation (Nelson et al., 2012). The authors explained that negotiation occurs when teachers offer differing perspectives, when colleagues question these perspectives, and evidence is used to examine the perspectives. Not-negotiation occurs when questions are procedural, indicating that PLC members view the work as directed by an administrator or facilitator. In a setting of not-negotiation, the maintenance of collegial relationships may drive conversation because the questioning of ideas or practices is
considered disrespectful or rude. Therefore, the dialogic stance toward inquiry emerges out of the ways in which teachers experience the responses to utterances in PLC conversation and the ways in which the utterances and responses lead to examination of professional knowledge and practice (Bakhtin, 2010). Much of the dialogue described by participants and observed in this study related to procedural issues or the completion of tasks specified in the PLC agenda. The participants described their PLC rarely questioning differing perspectives due to efforts to maintain collegial relationships.

Each of the interview participants spoke about their PLC conversations being directed by agendas developed outside of the PLC by the school’s leadership team. The participants described that they did not individually or as a PLC control the items on the agenda. However, they expressed that the agenda drove their PLC discussion. Four of the participants described a perception that the effectiveness of their PLC was evaluated by the leadership team based on their adherence to the agenda, which is why they let the agenda drive their discussions, even if they felt there were more pressing items for discussion.

A component of the dialogic stance of the PLC is the way in which the teachers collect data and use data as evidence. Distributed data is shared with all members of the PLC during discussion. Referenced data is data that has previously been shared but is not visible to all members during discussion. Data in absentia is data that is discussed but not shared with all members. Finally, anecdotal data is generalizations about student learning (Nelson et al., 2012). The use of the evidence component of the dialogic stance toward student learning data is shown below in Table 6.
Teachers in this study did not regularly seek out distributed evidence of student learning from their colleagues. However, there was acknowledgement from all participants that they felt that collaboration around student data was an activity that effective PLCs do regularly, and teachers referenced PLC conference attendance, school-wide professional development, and district documents as the source of their view on the importance of PLC data work. When participants described their experience with data analysis, they recalled the data to be mostly anecdotal or in absentia. They expressed that their PLC found it difficult to use distributed data during analysis because each teacher brought data from different courses and a different student cadre. The participants also described themselves and their colleagues feeling defensive or that they were evaluated by the rest of the PLC when analyzing data from their course or courses.

The nature of questions and the ways in which questions develop through collaboration are indicators of an inquiry stance in both Nelson and colleagues’ framework and Cochran-Smith and Lytle’s concept (Cochran-Smith & Lytle, 1999; Nelson et al., 2012;
Nelson et al., 2008). Participants in this study described the nature of questions in their PLCs as being procedural, technical, and often for clarification. Many of these questions arose from PLC members attempting to decipher agenda items and decide on next steps to accomplish tasks. Some described a sense of discomfort in questioning the ideas or beliefs of a colleague for fear of hurting feelings. When such questions were posed, participants described the ensuing dialogue as surface-level at best and arguing at worst. Rather than using questioning to generate new understanding and meaning, questions often focused on addressing agenda items. Thus, the participants did not experience the nature of questions in their PLC as opportunities to explore deeper understanding of instruction or student learning.

The dialogic framework links the nature of questions to the knowledge and beliefs of participants in a PLC (Nelson et al., 2012). The framework continuum discusses knowledge and beliefs ranging from a state of being regularly questioned to a state in which knowledge and beliefs are fixed, and is shown below in Table 7.

Table 7

<table>
<thead>
<tr>
<th>Knowledge and Beliefs (Nelson et al., 2012, p. 25)</th>
<th>Sustained Negotiation</th>
<th>Emergent Negotiation</th>
<th>Weak Negotiation</th>
<th>Not Negotiation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stance</strong></td>
<td>Inquiry-based Talk</td>
<td>Exploratory Talk</td>
<td>Connected Talk</td>
<td>Disconnected Talk</td>
</tr>
<tr>
<td><strong>Knowledge and Beliefs</strong></td>
<td>Knowledge and beliefs are regularly questioned and reexamined</td>
<td>Knowledge and beliefs are occasionally questioned and reexamined</td>
<td>Knowledge and beliefs relatively fixed</td>
<td>Knowledge and beliefs fixed</td>
</tr>
</tbody>
</table>

Six of the participants cited the lack of willingness to question beliefs and the fear of conflict as reasons that beliefs remained static in their PLC. Responses also indicated that participants experienced the privileging of differing views on the nature of knowledge among
their colleagues, with some privileging formal knowledge from experts outside of the school and others privileging knowledge gained through classroom experience. Rather than questioning one another in an effort to gain understanding about the different points of view, the participants described avoiding such conversations over concerns of conflict.

The participants’ descriptions of the stance of their PLC toward knowledge and their descriptions of their personal stance toward knowledge align with the theory of Cochran-Smith and Lytle of how PLCs influence the relationships of knowledge and practice for schools (1999). The authors wrote that when teachers in a PLC take an inquiry stance they generate knowledge by producing theories about their practice and investigate the theories and research of others. A central practice to this work is that teachers make their own practice problematic and then examine their individual and collective role in improving upon the identified problems of practice. However, the majority of participants in this study described their individual stance as being more interested in producing theories and investigating the ideas of others compared to the collaborative stance of their PLC. All of the participants described an inquiry stance as an ideal state of their PLC; however, the majority of the participants did not experience an inquiry stance as a member of their PLC. One participant explained that while inquiry was a component of the ideal state of the PLC, they questioned if they would actually learn anything new if their PLC engaged in more collaborative inquiry.

Nature of Knowledge. Breaking down the distinction between formal knowledge, based on research and expertise; and practical knowledge, gained through experience, is an important aspect of inquiry stance (Cochran-Smith & Lytle, 1999). A distinction between formal and practical knowledge often gives power and status to university and research based
knowledge. Therefore, practical knowledge assumes a lower status. The distinction between formal and practical knowledge leads to a de-professionalization of teachers. Hoyle (1982) wrote that criteria of professionalization include lengthy training, a body of knowledge, and autonomy for practitioners. If the PLC or school embraces the distinction between formal and practical knowledge, it serves “to reify divisions that keep teachers “in their place” – the separation of practitioners from researchers, doers from thinkers, actors from analysts, and actions from ideas” (Cochran-Smith & Lytle, 1999, p. 289). However, when members of a PLC experience both research and experience as opportunities for inquiry, the PLC is empowered as an autonomous group to generate local knowledge.

All of the participants in this study experienced the distinction between formal and practical knowledge, and they described experiencing in their school and in their PLC the existence of a hierarchy of knowledge, privileging knowledge from experts such as the presenters at PLC conferences first, the knowledge of administrators and coaches, second; and practical knowledge learned through experience of teachers third. Several participants described feeling as though the practical knowledge they personally had gained, or the practical knowledge that their colleagues had gained through experience was underutilized and undervalued. Participant responses indicated that the distinction between formal and practical knowledge inhibited the PLCs’ ability to combine both formal and practical knowledge to generate context-specific knowledge of their practice.

Adopting an inquiry stance requires teachers to engage in a broader conception of the meaning of practice. Teachers with an inquiry stance do not conceptualize practice as simply the aspect of their work that takes place in the classroom. Instead, teachers use their experience in the classroom to theorize about their work through a process of forming and
questioning frameworks to more clearly understand classroom practice (Cochran-Smith & Lytle, 1999). The PLC provides a venue in which teachers can engage in collaborative learning as they examine data and theorize about practice and student understanding. Therefore, teachers who engage in their work with an inquiry stance generate new knowledge of practice, and professional collaboration allows teachers to share new knowledge and learn from others (Hord & Roussin, 2013).

An inquiry stance generates “local knowledge,” which is knowledge that teachers and PLCs come to understand when they construct knowledge collaboratively (Cochran-Smith & Lytle, 1999, p. 291). Local knowledge encompasses the understandings that are integrated into the specific context of the school and PLC. Teachers in PLCs construct local knowledge when they ask questions about their identity as a teacher and a member of a PLC, ask questions about assumptions about students, ask questions about what sense students are making of the classroom experience, and ask questions about how their individual work connects to the work of the PLC and the school. Four of the participants in this study described specific efforts to develop local knowledge through collaborative work, focusing on examining the curriculum to determine the essential learnings for each course and content area. However, while the local knowledge generated allowed teachers to articulate aspects of essential learning for their PLC, the participants questioned if their PLC decisions were “right,” often indicating concern that their local knowledge might lack validity compared to expert knowledge. The expert knowledge was described as the ideal state. These responses demonstrate how the division between formal and practical knowledge often keeps teachers in their place. The teachers themselves gave responses that indicated that they valued external expert knowledge over their own local knowledge. The uncertainty surrounding the
PLC decisions indicated that participants view solutions to problems of practice as either “right” or “wrong” rather than leading to ongoing inquiry and refinement.

The adoption of an inquiry stance involves a different conception of how teachers learn over the course of their career rather than understanding teacher learning through the lens of an expert-novice distinction. Cochran-Smith and Lytle (1999) found that learning from inquiry about teaching practice requires both beginning teachers and experienced teachers to engage in similar work, meaning both new and experienced teachers pose problems of practice and ask questions through a problem solving process. The authors wrote that the connotation of expertise is at odds with the notion of continued learning over the course of a career.

Six of the participants in this study described experiencing an expert-novice distinction in their work. All participants described the importance of learning from experienced teachers and respecting the views of experienced teachers. The most experienced teacher interviewed described not experiencing the PLC process as an opportunity for learning, implying that the process was not generating new knowledge for him. Another experienced teacher described the value of their advanced degrees in content knowledge, while several teachers spoke of deferring to colleagues with advanced degrees. Less experienced teachers described their experienced colleagues as not valuing their ideas and opinions. The expert-novice distinction described by the participants, both in terms of years of experience and in terms of degrees obtained does not indicate an inquiry stance, which would have been indicated by an assumption that all teachers engage in similar inquiry as an ongoing aspect of their professional life. It does, however, highlight underlying issues of power within the PLC.
Power and Trust. Cochran-Smith and Lytle (1999) emphasized the importance of time for the PLC to work in order to develop a culture of inquiry. They wrote that if a PLC has sufficient time to work, ideas have an opportunity to develop even over complex issues. Similarly, Cranston (2011) found that trust in PLCs developed when PLCs adopted norms of risk-taking and change orientation. Time allows for trust to develop among members of the PLC, and trust develops through a willingness to raise sensitive questions with others and to be questioned by others. Time is also critical when it comes to issues of power within the PLC. Participants experienced an unwillingness to raise sensitive questions with their colleagues or openness to questions from their colleagues about negotiating the agenda, developing a decision-making process, sharing the work of the group with others, and dealing with the tensions that arise as multiple individuals share viewpoints, which all relate to their perception of power and trust within the group.

In addition to experiencing issues of power and trust in their PLC’s stance toward inquiry, the participants also experienced issues of power and trust in relation to the degree of participation and engagement with the PLC, both their personal engagement and their perception of the engagement of colleagues. Lave and Wenger (1991) wrote that when participation in a collaborative process becomes more intensive, a teacher experiences empowerment. However, the empowerment of an individual might limit the power of others if they are excluded from full participation. Conversely, refusing to fully participate could also be an empowering position in that the refusal by one or more members to fully participate might limit the full participation of others. Five participants described non-participating colleagues as holding power over their PLC. Non-participation was experienced as a sign of lack of trust in the collaborative work of colleagues who were
willing to participate. At the same time, participants who considered themselves engaged in the collaborative process described themselves as not fully trusting colleagues who they did not consider to be fully engaged.

**Supports and Resources.** Time was a theme woven through responses about the development of essential learnings, developing assessments, planning for instruction, collecting data, analyzing data, developing relationships, engagement with coaches and administrators, and the drawing distinction between departmental PLCs and common course PLCs. Participants were appreciative of the amount of time that the district committed to PLC work, both in professional development time within the district and professional development opportunities outside of the district. The participants experienced the time set aside for PLC work as a demonstration of the commitment of the school leaders to the PLC process.

Nelson and colleagues (2012) suggest that further research is needed to investigate the relationship between inquiry stance and the supports and constraints that exist within the school and district. Kennedy and Smith (2013) suggest that further research is needed to explore the role of student-learning data on collective reflective practice in PLCs and how teachers interpret the collective efficacy of their PLC. Therefore, this study asked participants to share how they experience many factors of their role as members of PLCs and how those factors are positive or negative influences on each teacher’s perception of their collective efficacy. The participants described factors of their collaborative work that they perceived as increasing their sense of efficacy as well as factors of their work that they felt impeded their efficacy.
Participant responses describing collective efficacy aligned with research on the sources of collective efficacy outlined by Bandura: mastery experience, vicarious experience, social persuasion, and affective states (1997). All of the participants in the study described encouragement from school administrators to attend the PLC conference to help teachers understand how successful PLCs function. The encouragement to attend the conference was a form of social persuasion. At the conferences, the teachers listened to presentations about successful implementations, which provided teachers with vicarious experiences of PLC work in other schools as well as an opportunity to interact with other teachers interested in learning about PLCs. However, the participants in this study described differences between their experience as a PLC member and what they considered to be an ideal PLC experience. Specifically, each of the participants had concerns about their PLC’s use of student learning data, and none of the participants described what they considered to be a major success in their PLC’s use of student data, indicating that the participants had not had mastery experiences. Tschannen-Moran and colleagues (1998) wrote that the lack of mastery experiences has the potential to influence the affective state of the school if the perception of failure leads to a concern over future failure. Goddard, Hoy, and Hoy (2000) wrote that the way in which a school interprets challenges is influenced by the affective state of the individuals that make up the school. Participants in this case described a polarization of affective states among teachers. While many teachers were described as persistent and supportive of PLC work, a small group of teachers were described as resistant, with some even choosing to leave their jobs. The descriptions of colleagues choosing to leave their jobs due to their experience as a member of a PLC suggested that the frameworks used to build
culture and structures had not aligned with the perspectives of a small group of teachers (Bolman & Deal, 2013).

Participants described building and district administration as committed to teacher collaboration through PLCs, citing opportunities for professional development, posters and other documents that depicted the district’s PLC process and mission, and regular communication about PLC work, such as agendas and articles for PLC discussion. The described communication and modeling by administrators of the concepts of a PLC and the ways in which PLC work might transform the school into a learning organization are key actions established in PLC literature (Cranston, 2009; Jones & Thessin, 2017; Wahlstrom & Louis, 2008). In addition to supporting the transition of the school into a learning organization, the participant descriptions of their administrators aligned in several ways with characteristics of an instructional leader (Blase & Blase, 1999), including setting an instructional vision, providing resources such as time, materials, and support, and supporting both individual and large-group professional development.

However, the participants in this study experienced their collaborative work as emerging from an administrative mandate, driven by an agenda controlled by the administration instead of the PLC. These descriptions align with what Hargreaves (1994) and Datnow (2011) described as contrived collegiality rather than collaboration. Participants expressed concern about proposed changes to the school’s master schedule that would change teaching assignments in an effort to facilitate more authentic collaboration. Participants also expressed concern that some colleagues were resistant to collaboration, and rather than confronting their colleagues, participants often avoided confrontation. The concerns raised by participants describe issues of distributed leadership, outlined by Spillane
(2004), in that the leadership actions taken by the administration emerges of formal leaders, informal leaders, and followers in the organization. The participants pointed to the commitment to PLCs and used documents, posters, and agendas as evidence of the commitment. However, the participants also expressed concern that the documents, posters, and agendas in some ways limited the collaboration of the PLC and led instead to task completion.

This study informs the current professional learning community literature by addressing the individual experiences of teachers in PLCs. This research examined the ways in which teachers describe their experience as a member of a PLC and how teachers interpret the influence of their personal experience and stance on their PLC’s stance toward inquiry. This research also looked at the ways that dominant and reticent voices influence the work of the PLC. Conclusions were that participants did not experience their PLC as adopting an inquiry stance. All participants expressed hope and many expressed belief that their PLC would eventually adopt an inquiry stance, but the pathway toward an inquiry stance was unclear. Participants experienced their personal stance toward inquiry as different from that of the PLC. While they did not feel that their PLC adopted an inquiry stance, the majority of the participants felt that they personally possessed an inquiry stance. Finally, while participants appreciated the commitment to the PLC process demonstrated by the district, structural barriers such as the master schedule and the ways that teachers were grouped into PLCs, as well as cultural barriers such as some teachers’ resistance to change were perceived as impeding PLC work.
Discussion of the Research Questions

The findings of this study that emerged as a result of answering the three research questions add to the literature on teacher collaboration. The three research questions that guided the work of this dissertation were:

1. How do individual teachers make meaning of their PLC’s inquiry stance toward student data?
2. How do teachers interpret the relationship between their personal inquiry stance and that of their PLC?
3. How do teachers interpret the influence of collaborative structures on their PLC’s inquiry stance toward student data?

In the following sections, the results of this study are interpreted through the analysis of the research questions and connected with the PLC literature.

Research question 1: The PLC’s inquiry stance. The first research question asked participants to describe their collaborative experiences using student data in a PLC and the stance of their PLC toward inquiry. Participants were asked to describe the nature of their collaborative work, focusing on collaboration around learning goals, instructional practices, and student understanding. A common theme emerged through analysis of the participant responses, PLC observations, and PLC document analysis. While participants discussed working in all three epistemological areas, they did not experience the majority of their collaborative work as based in inquiry. The teachers expressed concern that while all of the members of their PLC taught in the same content area, most PLC members were the only teacher in the school teaching their specific course. The lack of a common experience with either content or students among PLC members made it difficult for teachers to compare
student data, which led to the use of generalizations about student understanding rather than efforts to develop deeper understanding of classroom practice or student understanding. When discussing instructional practices, the generalizations about student understanding often resulted in efforts to verify effectiveness of past practice. The participants did not describe their collaboration around student learning data as a means to explore possible changes for future instructional practice.

The participant responses describing the epistemological stance of their PLC align with what Nelson and colleagues (2012) described as a teaching-focused stance due to the focus on past instruction and the development of learning goals. In many ways, the generalizations about student understanding and instructional practice described by participants related to their lack of understanding and experience in using data processes (Datnow & Hubbard, 2015). Specifically, teachers did not feel that they understood how a data analysis process could work with the departmental structure of their PLC.

The responses suggest that teachers felt professionally isolated, even when working in a collaborative group. The experience of isolation was described as feelings of personal ownership of their courses rather than a collective responsibility for the students of their colleagues, aligning with the work of Elmore (2007b), Hargreaves and Fullan (2012), and McLaughlin and Talbert (2006). Therefore, the participants experienced the PLC as what Datnow (2011) and Hargreaves (1994) termed contrived collegiality. The participants did not experience their work evolving spontaneously through inquiry.

In addition to examining teacher perspectives on the epistemological nature of their collaborative work, this case study also examined teachers’ interpretation of the nature of dialogue when engaged in collaborative work. Nelson and colleagues (2012) used the term
“sustained negotiation” to describe inquiry-based talk in a PLC (p. 11). For the dialogue within a PLC to be considered sustained negotiation, the dialogue needs to be analytic with descriptions to support the results of analysis, and evidence needs to be not only sought, but critically and collectively analyzed with questions emerging from the analysis. Participants did not describe the purpose of dialogue in their PLC in ways that align with the definition of sustained negotiation. Rather, the responses indicated what the framework describes as weak negotiation. Dialogue about student learning data was described by participants as being based on generalizations of student understanding, and evidence to support claims was either not sought or was anecdotal. Participants’ descriptions of their PLCs’ dialogic stance were related to their descriptions of the PLCs’ epistemological stance in that they did not experience PLC dialogue as a means to explore deeper understanding or generate new questions about practice.

Participants described the nature of questions that emerged through their PLC work as focused on the completion of agenda items. The procedural nature of questions relates to two themes discussed earlier: the use of agendas in PLC meetings and the generalizations necessary due to the lack of shared courses and students. Participants also described seeking clarity about PLC expectations through questioning. For example, a participant described teachers in her PLC often questioning one another to determine what work was expected of the team by the agenda. The nature of these responses points to contrived collegiality as opposed to inquiry-based collaboration (Datnow, 2011) because rather than using questions to pursue inquiry, questions were used to determine what work needed to be completed to meet school expectations.
A key theme that emerged through questions about PLC dialogue was conflict avoidance. One participant explained the lack of challenging colleagues through questioning as not wanting to appear disrespectful. When asked to explain, the participant described differing personalities and different levels of teaching experience among members of the PLC as the primary reason for conflict avoidance. Some participants described a balance of power between PLC members who were interested in questioning practice and learning through inquiry and teachers who were resistant to being reflective about practice or sharing classroom strategies. Several participants described conflict avoidance or concern about appearing disrespectful if they questioned practices as the primary barrier to their PLC truly collaborating. While there was recognition of the barrier that conflict avoidance presented to collaborative work, the participants did not indicate that they had ideas about how to address their concern with their colleagues.

The concern about conflict among members of the PLC was not universal, however. Two participants described having to be forceful or argumentative in order to engage their colleagues in PLC work. Neither teacher, however, viewed confrontational interactions as inherently negative. They both described disagreement and a process of searching for agreement as necessary for true collaboration to exist. Neither of the two teachers who expressed a value in conflict described that view as being shared by their colleagues or described processes in their PLC for working through conflict. They both said that the topic of conflict was not spoken about. Conflict avoidance suggests a lack of trust among members of the PLCs. The result of teachers experiencing low levels of trust was a degree of self-protection, what Hallam and colleagues (2015) describe as an unwillingness to take risks
and admit errors, and what Tschannen-Moran (2009) described as a disengagement from assessment of what led to less than successful collaborative work.

The theme of conflict avoidance aligns with the Knowledge and Beliefs and Social Relationships components of the dialogic framework (Nelson et al., 2012). The participant responses that indicate an unwillingness to engage in conflict align with a stance of weak negotiation. The lack of trusting relationships and the avoidance of conflict described by the participants in this study indicated that they experienced the knowledge and beliefs of their PLC as relatively fixed, and a concern for social relationships meant that interactions were congenial.

While the participant descriptions of the epistemological and dialogic approaches to inquiry suggest that the PLCs had not adopted an inquiry stance toward student learning data, all but one of the participants expressed at least some optimism about the nature of their collaborative work in the future. Each of the participants described emerging questioning of one another about classroom practices. Several participants described the number of occurrences in which questions about classroom practice emerged in PLC conversations as increasing over the course of the year. While the participants did not describe situations where assumptions, beliefs, or values were challenged in such conversations, all but one of the participants indicated that they were optimistic that over time trust would develop that would allow for such conversations.

Using the epistemological and dialogic frameworks to analyze responses about how participants make meaning of the inquiry stance of their PLC shows approaches to the nature of PLC work and the interactions in PLC meetings that limit sustained inquiry. Nelson and colleagues (2012) wrote that if some degree of negotiation does not occur among members of
a PLC, the PLC engages in joint work and not collaborative inquiry. The emerging negotiation and the movement toward a more nuanced epistemological approach indicate that participants experienced their PLC as having potential to adopt an inquiry stance in the future.

**Research Question 2: Relationship between teachers’ personal inquiry stance and that of their PLC.** This case study asked participants to reflect on their personal stance toward inquiry and describe the relationship between their personal stance and their experience of their PLC’s stance. When participants described their personal stance diverging from that of their PLC, the difference between the two stances was most often attributed to differences of viewpoint or philosophy. The participants described differences in how they and their colleagues approach knowledge and practice.

Cochran-Smith and Lytle described a tension between transmitting knowledge and constructing knowledge (Cochran-Smith & Lytle, 1999). This tension was experienced by several participants in this study. Teachers described frustration with colleagues who they perceived as being either resistant to “best practices” for PLCs or simply not interested in implementing “best practices” for PLCs. The teachers who described this frustration could not understand how their colleagues might disagree with what experts and administrators had determined to be the most effective practices for increasing student achievement. Analysis of the responses, however, showed that while participants described colleagues as “disagreeing” with best practices, what their colleagues were actually demonstrating was a stance that privileged a different concept of knowledge and practice. Rather than privileging “best practice” or expert knowledge, some teachers privileged the knowledge they had generated through their own experience. This case study found that the dialogue during PLC meetings
did not facilitate investigation of these perspectives on knowledge, which resulted in teachers feeling that there was tension between their personal stance toward formal and practical knowledge and that of their PLC.

Similar to the conflicting views over formal and practical knowledge, the participants also experienced philosophical differences in perception of the role of expertise in knowledge and practice. All of the participants in this study experienced some degree of tension between experienced teachers and teachers with less experience. This tension aligns with a knowledge-in-practice conception that expertise in teaching is the result of applying knowledge gained through experience over the course of a career (Cochran-Smith & Lytle, 1999). The existence of this tension did not mean that teachers were unwilling to learn from their colleagues. In fact, each of the participants described a desire to share experiences with their colleagues and to learn from their colleagues’ experiences. Several participants explained that learning the knowledge gained through the experience of their colleagues was an important component of their personal professional success.

However, participants experienced that the expert/novice distinction influenced the value of experiential knowledge. The value of experience was not perceived as being reciprocal. The less experienced teachers did not feel that their more-experienced colleagues valued their contributions to the PLC in the same way that they valued the contributions of more experienced teachers. Less experienced participants described feeling that their more experienced colleagues did not acknowledge their professionalism or value ideas or suggestions that were presented to the PLC. They explained that they felt that experienced colleagues did not want to hear their voice or that their opinions were discounted.
Conversely, the more experienced teachers felt that school improvement efforts such as PLCs privileged new ideas over past practices, even if the past practices were considered successful. Several teachers indicated that they did not feel that their advanced degrees were honored to the degree that they should be. These teachers felt that they had a level of content expertise that should have greater influence on essential learning decisions and instructional practice decisions in the PLC. While both the less experienced teachers and the experienced teachers expressed a desire to learn from their colleagues, their responses also indicated that the two groups privileged knowledge and experience differently. The tension described by participants indicated a lack of understanding of the different ways of looking at knowledge and practice as well as a lack of an inquiry process to build such an understanding.

These divergent views about knowledge and practice were also present in responses about how knowledge is generated, what Cochran-Smith and Lytle called “knowledge-of-practice” (p. 250). The knowledge-of-practice concept assumes that teachers across their career generate knowledge by making their classroom a site of inquiry (Cochran-Smith & Lytle, 1999). The lack of perceived inquiry within the PLCs led to teachers searching for collaboration outside of the large PLC. One of the participants described working with another teacher who taught the same course. Their collaboration was described as being centered on student-learning data with a desired outcome of learning from one another’s instructional practices, therefore aligning with an inquiry stance in ways that the teacher did not experience in the large PLC. Another teacher described relying less on collaboration for learning and instead focusing on her own learning, both from the analysis of student learning from her own classroom and from seeking out books, articles, and other resources to support her work.
The participants in this case study each brought their own stance toward knowledge and practice to their PLC. While there was consensus on the role of the transmission of knowledge-for-practice for implementation in their PLCs and in their classrooms, teachers held divergent views of the role of practical knowledge and the role of experience.

**Research Question 3: Influence of collaborative structures on their PLC’s inquiry stance.** Nelson and colleagues suggest that an area in need of further research is the relationship between their two-dimensional framework and external supports and constraints of the organizational context that surrounds the PLC (Nelson et al., 2012). Interview questions related to the third research question asked participants to reflect on their perception of the relationship between their collaboration in a PLC and their perception of their PLC’s collective efficacy. The questions asked participants to reflect on aspects of their PLC work that they perceived as supporting their PLC’s efficacy, as well as aspects of their PLC work that they perceived as barriers to their PLC’s efficacy. In addition to describing the participants’ experiences of efficacy, the responses to these questions described participants’ experience of leadership and interpersonal relationships.

The perception of the collective efficacy of a PLC is formed through four sources of efficacy: mastery experiences, vicarious experiences, social persuasion, and emotional arousal (R. D. Goddard et al., 2000). The results of this study indicate that participants described experiences that aligned with each of the four sources of collective efficacy, and these experiences were framed by interactions with school leadership and interpersonal relationships with colleagues.

**Supports for collaboration.** The participants in this study experienced the building and district administration as being committed to building and sustaining a culture of
 Participants reported that the school district supported collaborative work by providing opportunities to attend professional conferences, which were sources of vicarious experiences. Teachers who attended the conferences were able to learn about successful implementation of PLCs in other schools. Participants who had attended the PLC conference cited such experiences as a turning point in their buy-in to collaborative work, and those that attended reported that their experience at the conference was one that they believed would benefit all of their colleagues.

In addition to professional conferences, the participants described how the district supported vicarious and social persuasion experiences by encouraging teachers and PLCs to travel to other districts to learn from successful practices outside of the district. The vision and opportunities for learning provided by the district and building administration established a vision and purpose for professional learning and for collaborative work (Bezzina, 2006). The efforts to establish a vision of a learning organization by district and school leadership at the district site align with the disciplines of mastery, mental models, shared vision, team learning, and systems thinking outlined by Senge in work on learning organizations (2006).

The structures put in place by district and building leaders to support collaborative work, such as protected time for PLC meetings and agendas to guide PLC work, were ways in which the participants in this study experienced the building and district leaders as leading collaborative work in the school. These responses align with the work of (Blase & Blase, 1999) on instructional leaders which found that supporting collaboration was one of six key strategies. Participants described a significant change in their view of administration, in the level of commitment to collaboration and improved instructional practices, with the arrival of the new building administration. Protected time for PLCs to meet, organized agendas for
PLC meetings, shared learning through articles linked in PLC agendas, and regular classroom and PLC meeting observations with feedback were all aspects of structures and routines that align with the instructional leadership literature (Blase & Blase, 1999; Jimerson & Wayman, 2015; Marsh & Farrell, 2015). Participants experienced the structures and routines as sources of social persuasion to increase their efficacy as a collaborator and teacher.

**Barriers to collaboration.** While the district and building administration were described as supportive leaders of collaborative work, participant responses indicated that the efforts to share a clear vision, to provide teachers with vicarious experiences of successful collaboration, and to provide social persuasion to increase teachers’ sense that they had the capabilities to achieve their goals, were at times experienced as stress and pressure, which influenced the affective state of the teachers. The experience of stress and pressure were connected in participant responses to concerns about time, resources, and knowledge needed to implement collaborative practices. Some participants described the efforts for improvement and change within the school made them question some of their previous instructional experiences that they had considered mastery experiences. One teacher described the level of observation and feedback from building principals as an “ego blow” and described a decreased sense of efficacy.

Efforts to change the master schedule and the structure of PLCs so that more courses would be taught by multiple teachers were described as significantly influencing the affective state of the teachers in the school. While participants expressed a broad understanding of why the change would be implemented, they expressed concern over how their professional experiences in the school would change as a result. Participants also described uncertainty about how the change would lead to improved student learning. Teachers described
uncertainty about what their future teaching task would entail and what their future collaborative tasks would entail.

The decision to change the master schedule and the structure of PLCs and the ways in which the potential changes were experienced as stress indicated that the decision-making process in the school was not experienced as distributed between administration and teachers.

While there was evidence from participant responses that the school had established a leadership team made up of teachers and administrators, the participants in this study could not clearly identify the role the team played in decision making. The lack of clarity about how leadership was distributed was described as a source of stress by the teachers, and participants felt that the lack of clarity negatively influenced levels of trust between teachers and administration. Such responses align with research on distributed leadership that indicates that trust creates opportunities to address problems before they are compounded and establishes a sense of safety during change (A. Kennedy et al., 2011; Louis et al., 2009; Tschannen-Moran, 2009). Hallam (2015) found that two factors influenced principals’ ability to facilitate trust: the degree of micromanagement and the process used to construct collaborative teams. This study found that both were perceived as barriers to trust in the participants’ PLCs.

Participants in this study described issues of trust as indicators of strained professional relationships among colleagues. The strained nature of professional relationships was experienced as a barrier to collaborative work and a barrier to teacher efficacy. Some of the concerns about accountability and trust among members of PLCs were attributed to a culture that was not entirely collaborative. The culture described by participants aligned with what Hargreaves (1994) called contrived collegiality in that
collaborative work resulted from administrative direction, took place at particular times and places, and was designed to produce predictable outcomes. However, the fact that the site for this study existed in a state of contrived collegiality did not mean that collaboration did not take place or would not take place in the future. Research by Datnow (2011) indicated that collaborative cultures can emerge from cultures of contrived collegiality if leaders develop trust among teachers and promote a positive stance toward inquiry and collaboration.

To move from contrived collegiality to collaboration requires trusting relationships among members of the PLC that encourage the free flow of ideas and inquiry. The participants in this study who considered themselves supportive of collaborative work expressed frustration with their colleagues perceived as resistant. Participants also expressed frustration with their personal lack of efficacy in reducing resistance through strengthening professional relationships with their colleagues. However, participant responses provided evidence, such as one-on-one meetings with resistant teachers, that the new administration was engaged in efforts to understand the resistance with a goal of eventually answering the questions and developing solutions to the issues that led to the resistance. This work aligned with the findings of Tschannen-Moran (2009), who found that principals foster trust when they deal skillfully and swiftly with instances of lack of professionalism.

Information presented in this section examined teacher perceptions of their personal inquiry stance and the inquiry stance of their PLC using frameworks developed by Nelson and colleagues (2012) as well as Cochran-Smith and Lytle (1999). Analysis of the data found that participants generally did not experience their collaborative work to be based in inquiry. However, individual teachers expressed desire to pursue inquiry to generate local knowledge and improve practice. Participants were asked to describe supports and barriers
to their individual and collaborative pursuit of inquiry, and their responses were compared to teacher efficacy literature and school leadership literature. This study suggests that the stance toward knowledge and inquiry of individual teachers influences the collective stance of collaborative groups.

**Implications for Practice**

This case study provides an in-depth description of the lived experience of teachers in professional learning communities in a mid-size Midwestern high school. This case is unique in that a new team of administrators worked to revitalize the work of teachers in PLCs. This research examined the stance that teachers take toward student data, the stance that teachers take toward collaborative inquiry, and the teachers’ perceptions of contextual factors that support and constrain their sense of professional efficacy and agency.

Based on the experiences of the participants in this case study, as well as the existing literature discussed in Chapter 2, the following section proposes specific implications for administrators and teachers wishing to implement, revitalize, or sustain professional collaboration. The following section also includes recommendations for both teacher and administrator preparation programs.

**Implications for School Leaders.** The participants in this case study revealed that there were specific conditions in their experience that supported their professional collaboration. The participants also described experiences of conditions that were perceived as barriers to professional collaboration. These experiences are instructive for administrators who support teachers in professional learning communities. The data collected in this study combined with existing research on professional learning communities provide clarity on how teachers experience the work of their PLC and the ways in which PLC work influences
their instruction and student understanding. The five recommendations that follow provide practical information for school administrators to implement.

**Develop school structures that support inquiry through collaboration.** The first recommendation for developing and sustaining collaborative inquiry in a school is to provide structures that support teacher collaboration. The participants in this study spoke of some structures that they perceived as being supportive of their collaboration as well as some structures that they perceived as barriers to their collaboration. Time emerged as an important structure for supporting PLC work. The site of this research provided all PLCs with an hour of collaboration time most Wednesdays of the school year. This hour was achieved by moving the start of the school day back once a week, and the hour was considered by the participants to be essential to their work. However, this structure for PLC time resulted in PLCs that were structured much like a department meeting, meaning all teachers from a content area were in a PLC. The findings of this research indicate that time should be built into the daily schedule for course specific or grade-level specific collaboration. The department-level collaboration in this case often lacked focus or certain members of the PLC felt disconnected from the PLC work because the focus of the work was on courses not directly related to their own courses.

This research indicates that when possible, the master schedule should be built in such a way that maximizes the number of courses that have multiple teachers teaching the same course and that these teachers need time built into the day for collaboration. This research site had very few courses taught by multiple teachers, and participants perceived this as a barrier to their collaboration. Multiple teachers teaching a common course allows for focused discussion on issues of curriculum, instruction, and assessment, and therefore a
common set of student data emerges for analysis. In a PLC that comprises an entire department, student-learning data is either not directly related to most of the teachers’ instruction, or the data is generated from a contrived assessment that spans multiple courses and grade-levels.

School leaders should carefully consider their school size and organization when building PLCs. This research site did not build department-level PLCs and limit common course collaboration intentionally. Instead, the size of the school and therefore the number of teachers in each department and the number of courses offered in each department resulted in the structure of PLCs. The participant responses about the effectiveness of their PLC and especially their PLC’s effectiveness in the data analysis process raised questions about the overall effectiveness of the school’s PLC structure. School leaders in smaller schools might consider other ways of building PLCs. For example, core courses at each grade level might meet collaboratively on a regular basis. While this structure would limit collaborative discussion on content specific issues, the teachers would share students and would therefore be able to analyze patterns of student understanding and achievement, which would facilitate collaboration around instructional practices and cross-curricular learning and supports for students. Grade-level PLCs meeting during the school day, combined with department-level PLCs meeting on Wednesday mornings, would provide multiple perspectives on curriculum, instruction, assessment, and student-learning data. Such a structure might also expand social networks for teachers beyond the department level.

PLC facilitators, whether they are administrators, instructional coaches, building leadership team members, or any other designated leader, must clearly define the nature of their role when working with teachers in PLCs. Participants in this study reported that a
structure existed for facilitators to both direct and monitor the work of PLCs. However, the participants were not able to clearly articulate the process for direction and monitoring of their collaborative work. The lack of clarity resulted in participants spending PLC time attempting to determine what work was expected of them and what the outcome of that work was supposed to be. The lack of clarity also resulted in a perception of a divide between the teachers and the “they,” meaning the directors and monitors. This divide put teachers who assumed leadership roles in a difficult position of separating themselves from other teachers and yet not being fully integrated into the “they” group. Clearly defining the structures of leadership, the mission of leadership groups, and a clear process of facilitation and feedback for PLCs positions all members of the school community as learners and researchers rather than experts. Positioning the entire community as learners aligns with Cochran-Smith and Lytle’s (1999) finding that the idea of expertise is at odds with the idea of life-long learning.

While developing structures that support inquiry through collaboration, it is important for school leaders to be cognizant that simply building structures and routines does not develop or support a culture of learning and inquiry. While structures and routines that support collaboration are important, this study demonstrates the importance of developing structures and routines based on knowledge of the individual teacher needs and through a process that distributes leadership and decision-making.

**Develop a shared vision for the school that supports an inquiry stance through collaboration.** School leaders working to develop and support an inquiry stance toward collaboration need to develop awareness of the three conceptions of knowledge and practice outlined in the research of Cochran-Smith and Lytle (Cochran-Smith & Lytle, 1999). This study found that teachers’ individual conception of knowledge and practice varied from that
of colleagues. However, the responses did not indicate that participants were aware of the
different conceptions of knowledge and practice nor the inherent conflicts based on opposing
conceptions. The lack of awareness led to tension within PLCs and within the school culture
due to the fact that teachers held different views on concepts such as formal knowledge,
practical knowledge, expertise, and inquiry. School leaders may reduce the tension between
different views of knowledge if, as Fullan (2014) wrote, they embrace the different views of
knowledge as checks and balances, and therefore, the diversity of approach is important to
the development of context-specific knowledge.

Participant responses indicated that their image of the relationship between
knowledge and practice as well as their perception of their colleagues’ images of the
relationship between knowledge and practice were grounded in both the conception of
knowledge-for-practice and knowledge-in-practice. The participants indicated that there was
a set of best practices for their work, established by experts, that teachers should strive to
implement. The implementation of these best practices was hierarchical, either by learning
from experts at a PLC conference, or through information passed from district administration
to building administration to teacher leaders to teachers. At the same time, participants
valued practical knowledge gained through classroom experience. This was true of both
experienced and inexperienced participants. An acknowledgement by school administrators
of the different perspectives on knowledge could be the first step in a school-wide process of
inquiry into different perspectives of knowledge and practice in which teachers and
administrators learn about how the different perspectives lead to different interpretations
might reduce misunderstandings among colleagues.
Once teachers and administrators have developed an understanding of the differences between conceptions of knowledge and practice, school communities should engage in a process in which all stakeholders examine their individual and collective stance toward the relationship of knowledge and practice. When teachers and administrators have an understanding of their personal stance toward knowledge and practice, school leaders should begin to develop and support a stance of knowledge-of-practice, in which the school system learns when individuals collaborate to challenge assumptions and study their students and classrooms to identify issues of practice (Cochran-Smith & Lytle, 1999). Grounding the collaborative work in the concept of knowledge-of-practice requires all members of the school community to continually reflect on and question the ways in which they have experienced knowledge and practice in the past and become aware of the framework for a new image.

One specific way for school leaders to guide a school through reflection on images of knowledge and practice is to examine the limitations of the distinctions between formal knowledge and practical knowledge. Specifically, it is important that members of the school community examine the issues of power that arise when formal knowledge or practical knowledge is privileged. School leaders should adopt and model an inquiry stance to their work in which “what it means to generate knowledge, who generates it, what counts as knowledge and to whom, and how knowledge is used and evaluated in particular contexts are always open to discussion” (Cochran-Smith & Lytle, 1999, p. 272). The knowledge-of-practice conception distributes power throughout the school. The knowledge-of-practice concept does not mean that learning from experts at conferences or learning from the experience of veteran teachers is no longer important. Instead, the concept asks all members
of the school community to examine expertise and experience within the context of the school and through inquiry to develop new knowledge.

In addition to reflection on the limitations of the distinction between formal and practical knowledge, school leaders might consider engaging the school community in reflection on the expert-novice distinction. The use of case studies such as this research would provide examples of how the distinction plays out in the school setting. The participants in this study spoke of the distinction between formal and practical knowledge in two ways. First, teachers spoke of differences in expertise in formal or content knowledge. The assumption was that those with the most formal or content knowledge were by definition a better teacher compared to colleagues with less experience. Second, teachers spoke of differences in expertise in terms of the amount of experience of a teacher, both in total number of years taught and total number of years taught at the research site. Participants identified tension in both PLCs and the school community in general connected to these distinctions.

To adopt an inquiry stance, the school community needs to move beyond the expert-novice distinction and instead view learning as a life-long endeavor. School leaders can model a stance that all members of the school community engage in similar intellectual work by questioning practice, challenging assumptions, drawing on the work of others, and applying new learning. Such actions align with recommendations from instructional leadership literature (Blase & Blase, 1999; Kose, 2009; Youngs & King, 2002). Modeling this view of inquiry and knowledge requires significant collaboration and transparency on the part of all school leaders in the school’s decision-making process. However, a commitment
to transparency and distributed leadership has been found to increase trust and increase collaboration (Hallam et al., 2015).

School leaders wishing to develop and support an inquiry stance through collaboration should be careful not to confuse contrived collegiality with collaborative inquiry. Contrived collegiality occurs when teacher collaboration time is controlled by administrators or facilitators through directive agendas and expected outcomes from meetings (Hargreaves, 1994; Hargreaves & Fullan, 2012). The participants in this study indicated that their PLC served many functions, including the setting for discussions about the design and implementation of curriculum, discussions about the design and implementation of assessments, discussions about student-learning data, and discussions about instructional practices. The PLC also served as the setting for discussions about planning and scheduling interventions for students who needed additional assistance beyond the classroom, discussion of articles or videos distributed by administration, planning and discussing peer observations, meeting with K-12 vertical teams, and general discussions of classroom planning, pacing, and activities. Participants also described the nature of the work as being directed in a top-down fashion. When the nature of PLC work is broadened to encompass such a wide range of work, and the work is directed in what is perceived as a top-down manner, the teacher perception of PLC time strays from an authentic time of inquiry-based collaboration and instead becomes collective work time.

The final recommendation for school leaders to develop a shared vision of an inquiry stance through collaboration is to embrace collaboration outside of the PLC structure. Participants in this study spoke of important learning that resulted from visiting other school districts and collaborating with teachers beyond their school. Participants also discussed
important collaborative relationships developed with teachers in different departments within the school. The encouragement of these practices at the research site was perceived by participants as an example of the trust that administrators had in teachers to choose the direction of their inquiry and an example of the importance of learning throughout the course of a teacher’s career.

**Develop data processes that support authentic collaboration.** Participants discussed the importance of using student-learning data to examine effectiveness of past instruction as well as examining changes to instruction for the future. However, the participants did not discuss any specific protocols or processes that were used to collect or analyze student-learning data. Coburn and Turner (2012) suggested that school leaders need to engage in conversations with individual teachers and with PLCs about the nature of student-learning data, processes for the collection of student-learning data, processes for the analysis of student-learning data, and processes for determining implications from the analysis of student-learning data. As discussed earlier, it is important that these conversations take place through the modeling of an inquiry stance. Through inquiry the school community will generate data processes appropriate for the school’s context. Appropriate data processes facilitate PLC discussion of successful instructional practices to improve student learning.

The process of exploring sources of data engages the PLC in discussions of current assessments and the ways in which existing assessments align with student learning expectations and instructional practices. Discussions about the process for collecting data center on the creation or modification of assessments and scoring criteria. The determination of timelines for instruction and assessment also occur during data collection discussions. During the data analysis stage, teachers collaboratively ask questions and generate meaning
from the student-learning data. This process involves looking for trends in student understanding as well as clarifying the methods best suited for analysis. The implications stage of the data process involves teachers in a collaborative process of deciding how to put the meaning generated through analysis into practice (Datnow & Hubbard, 2015; Nelson et al., 2012).

While engaging in collaborative conversations about the phases of the data process, school leaders should work with teachers and PLCs to clarify ways in which data is invoked in the data analysis stage. The participants in this study suggested that the most common form of student-learning data discussed in PLC meetings was anecdotal data, and therefore discussion of the data often included general impressions of student understanding. Nelson and colleagues (2012) suggested that in addition to anecdotal data, PLCs might also use data in absentia, referenced data, and distributed data. Data in absentia is data that was previously analyzed but is not present for the members of the PLC during discussion. Referenced data refers to data that is available to an individual teacher but not available to the rest of the PLC during discussion. Distributed data is evidence of student-learning that is shared with all PLC members during the analysis stage. As PLCs develop data processes, it is important that they decide how they will invoke data during the analysis stage.

In addition to engaging PLCs in discussions of data processes, school leaders should consider engaging in conversations about tools to assist PLCs with analyzing the nature and effectiveness of their collaboration around student data. The use of a framework such as the Two Dimensions of an Inquiry Stance Toward Student-Learning Data developed by Nelson and colleagues (2012) and used as a conceptual framework for this research could be used to structure initial conversations within a PLC about how the members of the PLC will
approach student data from an epistemological perspective as well as how the PLC will engage in conversations about student-learning data. The framework could also be used periodically within the PLC to reflect on their work, identify areas of success, and identify areas of their work that do not align with their initial intentions.

The use of a framework as described above would also be useful for school leaders if implemented in all PLCs in the school. Used this way, the framework could provide for common language which would encourage and facilitate conversations among teachers in different PLCs. The common language would also be beneficial when new members are added to a PLC. Reflecting on past discussions through the lens of the framework would be beneficial to all members of the PLC, and the framework would be an important tool to assist a new teacher to engage in the PLC work.

The use of a framework to support a PLC’s data process has the potential to undermine the inquiry stance of the PLC or the school if the framework is viewed as either a list of expectations or worse, an evaluation tool. A framework could be viewed as a tool of a knowledge-for-practice stance toward knowledge in which there is a set of best practices or an expert knowledge base against which the PLCs will be evaluated. It is important, therefore, that the use of a framework be approached with an inquiry stance from all members of the school community. The Two Dimensions of an Inquiry Stance Toward Student-Learning Data (2012) is aligned to research on inquiry stance and would therefore assist in keeping discussions centered on inquiry. The framework is a starting point for discussions on data use and should generate collaborative questions. School leaders might consider, however, the complexity of the Two Dimensions framework and choose to focus
on specific areas of the framework over time rather than attempting to use the entire framework at once.

**Develop social and political conditions that support an inquiry stance through collaboration.** The site of this case study was a high school with a new administrative team working to revitalize collaboration in PLCs. Participants voiced broad support for the new leadership and described them as supportive of teachers’ work. However, participants also described a strong voice of dissent from a group of teachers. This study aligns with school leadership literature that indicates that school administrators should model instructional leadership and work to distribute leadership. Instructional leaders provide direct assistance to teachers, provide learning opportunities to all staff, participate in curriculum development, and participate in action research (Blase & Blase, 1999). Distributed leadership shares leadership roles throughout the school organization (Louis et al., 2009). This study supports previous research suggesting that school administrators develop a system in which teachers provide feedback, actively build trusting relationships, engage the school community in conversations about working through conflict and disagreement, and view resistance as an opportunity to learn.

School leaders should build leadership capacity in all members of the school community. One way to build leadership capacity in teachers is to involve them in the decision-making process. Tschannen-Moran (2001) wrote that involving teachers in the decision-making process increases the likelihood of acceptance of decisions. Involving a large number of teachers in the decision-making process makes it likely that there will be differences in the level of expertise among decision-makers. The difference in expertise allows for the same type of questioning conversations that take place in PLC meetings in
which assumptions are challenged and new theories are generated. While involving a large number of teachers to participate in the decision-making process might result in a longer timeframe to reach a decision, the decision will more likely be accepted compared to a decision made in isolation.

In addition to involving stakeholders in the decision-making process, school leaders can distribute leadership by clearly defining the roles of various school leadership teams. The participants in this study voiced uncertainty about the role of the building leadership team, the administrative team, the problem-solving team, and the role of instructional coaches. The uncertainty could be resolved by first establishing the purpose of each leadership team and clearly communicating the purpose of each team to all stakeholders. Next, school leaders should actively recruit teachers with high levels of interest, high levels of expertise, or both to serve on these teams. Finally, it is important that these teams model the same approach to inquiry in their work that PLCs use in their work.

Participants described receiving regular feedback from administrators and coaches after classroom observations. However, participants did not describe a process for teachers to provide feedback to school leaders about the PLC process. A process of regularly surveying teachers about their experience in the PLC process would provide important data for school leaders. The survey should ask teachers to describe their perception of their collaborative work, identify areas for celebration, and identify areas where additional support or changes are needed. Additional feedback data could be gathered through interviews with teachers in which a tool such as the Levels of Use protocol is used by administrators or PLC leaders to determine how the teacher experiences collaboration (Hord & Roussin, 2013). The Levels of Use interview is an informal conversation in which the interviewer seeks to
ascertain how a teacher engages in collaboration and what supports or assistance might be needed.

All members of the school community should engage in conversations and learning focused on relationship building and trust. Hallam and colleagues (2015) found that trust is developed in collaborative teams when team members follow through on commitments and when they show kindness and patience. Therefore, it is important that PLCs engage in conversations in which responsibilities and commitments are clearly defined. PLCs can define norms for their work that serve to remind members of the PLC of responsibilities for work and expectations for interactions with one another.

The majority of participants in this study described themselves as avoiding conflict with their PLC and also described their colleagues as avoiding conflict as well. One participant said that her team never discussed conflict and therefore had not developed processes for disagreements during PLC meetings. Professional development opportunities centered on productive conflict would help such PLCs develop the ability to question one another and to disagree with one another that is necessary in order to pursue collaborative inquiry.

Hallam and colleagues (2015) found that school administrators demonstrate trusting relationships with teachers when they involve teachers in the hiring process. This finding was supported by this research. Participants described the hiring process, particularly their participation in the hiring process, as a way for the administration to show trust in the work of the PLC. Involving teachers in the hiring process not only demonstrates that the principal values the opinion of the teachers involved, but also demonstrates a commitment to the ongoing work of the PLC.
The final recommendation for developing the social and political conditions that support an inquiry stance is to focus on how all members of the school community work with colleagues who question the value of collaboration, are critical of the implementation of collaboration, or who choose not to fully participate in collaboration. As described throughout this research and in the inquiry stance literature, a person with an inquiry stance questions assumptions, asks for evidence, and seeks to generate new frameworks and theories for practice (Horn, 2005; Little, Horn, & Bartlett, 2000; Nelson et al., 2008). It is therefore important that the school community adopt a stance that views questions, concerns, and skepticism as opportunities for collaborative learning rather than phenomena that should be ignored, dismissed, or extinguished.

Aspects of resistance experienced by participants in this research were related to other conditions previously discussed such as lack of distributed leadership, lack of opportunities for feedback, and lack of trusting relationships. Participants also described resistance, however, in colleagues who simply did not agree with the direction of school initiatives such as PLC work. Assuming that leadership is distributed, feedback is solicited and honored, and trusting relationships are cultivated, concerns raised by colleagues about the direction of innovation offer opportunities for learning and improvement for both those who support initiatives and those who question the initiative.

Similar to the process of conducting interviews to determine the Levels of Use, interviews can be conducted by administrators or PLC leaders to determine Stages of Concern (Hord & Roussin, 2013). The Stages of Concern interview identifies how individuals feel about collaboration. When the emotions of the teacher are identified, it
becomes easier to engage in conversations that involve inquiry to find solutions to the concerns.

It is important for all members of the school community to have and maintain patience when dealing with colleagues who are perceived as resistant to change. Research indicates that peer pressure or administrative pressure to conform does not decrease resistance, but ongoing collaboration that embraces the questioning of practice and questioning assumptions develops trust and assuages concerns (Datnow, 2011; Hargreaves & Fullan, 2012). If all members of the school community are engaged in ongoing discussions, what is at first perceived as resistance might instead be perceived as an opportunity for inquiry. If members of the community embrace the inquiry process, the time invested in learning with colleagues who raise critical questions has the potential to generate new knowledge for all members of the team.

Participants described colleagues who had decided to leave the district because of frustration with the direction of the district, and several participants felt that the fact that their colleagues decided to leave was an overall positive development for the school culture. When asked why they viewed their colleagues’ decision to leave as positive, the participants explained that they did not think that there was a better solution because some teachers were simply not willing to compromise their stance toward professional collaboration. The fact that some teachers felt that there was no recourse other than to leave their job endangers the stance toward inquiry for the school. The situation endangers the sense of trusting relationships among colleagues, even for teachers who support the direction of the school or district.
Implications for teachers: Taking an inquiry stance. With the large amount of research that supports professional learning communities and data practice (Coburn & Turner, 2012; Datnow, 2011; Little, 2012; Marsh & Farrell, 2015; Nelson et al., 2012; Spillane, 2012), a goal for schools organized into PLCs should be that teachers collaboratively use data to reflect on practice and to drive an inquiry process to improve practice. The previous section outlined steps that school leaders should take to support collaborative inquiry in schools. The use of the term school leaders was chosen intentionally to avoid the dichotomy between administrator and teacher. However, there are implications that emerged from this study that pertain specifically for teachers participating in PLCs. In the following section, two specific implications for teachers are explored which provide advice for teachers as they engage in PLCs and engage in data processes.

Reflect on the individual conception of knowledge and practice. Teachers should regularly reflect on their stance toward knowledge and practice and how that stance influences their work in the classroom and their work with peers. Such reflection includes the role of outside experts, research literature, and the ways in which best practices influence their approach to their work. Teachers should reflect on the value they assign to practical knowledge and to their classroom experiences as well as their relationships with mentors or coaches.

Teacher reflection on their images of knowledge and practice will help teachers to be better able to detect the stance of their colleagues. Through the process of working to understand the stance of colleagues, teachers will be equipped to view statements and questions that arise through collaborative work through the lens of their colleagues’ stance. The identification of the stance their colleagues take toward knowledge and practice will help
PLCs move from conflict avoidance to engaging in professional discussion on difficult issues.

**Engage in learning.** Participants in this study experienced multiple opportunities for professional learning including learning outside of the district, through school-wide professional development, and through inquiry work in their PLC. Teachers interpreted the opportunity to travel to conferences, specifically conferences focused on PLC work, as important in helping them clarify why PLC work was important. They also experienced the conferences as important opportunities to learn strategies for the successful implementation of PLCs. Teachers in this case study were also encouraged to engage in learning with teachers from neighboring school districts. They described these experiences as being very valuable. They appreciated the opportunity to choose their topic and location for the learning.

Teachers should seek out learning opportunities that emerge from examination of student-learning data and reflection on practice. The first step in this process is for teachers in PLCs to engage in discussion about what types of data need to be brought to PLC meetings, how that data will be shared, protocols for analysis for data, and protocols for discussion of the implications from the analysis process. The implications that arise from the analysis of PLC data provide the starting point for inquiry. The inquiry process may lead the PLC to seek out answers internally or to find external resources to answer their questions.

**Implications for teacher preparation programs and administrator preparation programs.** Preparation programs for both teachers and administrators should consider this research as well as previous research in discussions on the relationships of knowledge and practice and the role of teachers and administrators in developing and sustaining professional
learning communities. Both teacher and administrator preparation programs can learn from the experiences of teachers in this case study as they worked to reinvigorate PLCs.

Administrator preparation programs could use this case study to help future administrators examine PLCs through the eyes of individual teachers. Specifically, this case study could be used along with the work of Hord and Roussin (2013) and Fullan (2014) as a basis for discussion about implementation of change and resistance to change. The case study could be used in lessons about leadership style and the ways in which the administrator’s leadership style is perceived by different personality types. This case study will be valuable when discussing both positive and negative aspects of distributed leadership and how to determine the degree to which leadership is distributed and the outcomes of distributed leadership. Future administrators can also learn about how the interpersonal relationships, issues of power, and resistance to change influence PLC work.

Future administrators can learn about how structures such as the size of the school and the design of the master schedule influence the work of teachers in PLCs. This case study provides insight as to how future administrators might structure teacher collaborative opportunities differently depending on the size of the staff and the courses offered in the school. The results of this study revealed that school leaders need to consider four factors when designing a plan for implementing new PLCs or supporting existing PLCs. The implications include developing structures that support inquiry through collaboration, developing a shared vision for the school that supports an inquiry stance through collaboration, developing data processes that support inquiry through collaboration, and developing social and political conditions that support inquiry through collaboration. This
case study suggests that these implications are necessary for PLCs to take an inquiry stance toward their work.

Teacher preparation courses can use this case study to promote reflection on images of knowledge and practice and discussion on the tensions that exist among the different approaches. Specifically, this case study could be used in discussions in which future teachers are asked to reflect on their views and understanding of expertise, both in new teachers and in experienced teachers. These discussions would help future teachers understand the knowledge and expertise they will bring to the profession as new teachers as well as how their knowledge and expertise might be viewed by more experienced teachers.

Teacher preparation programs can use this case study to promote an understanding of the importance of data literacy in prospective teachers. Bocala and colleagues (2015) suggested that teacher preparation programs use case studies to teach prospective teachers about data processes. This study provides evidence of the ways in which teachers are asked to analyze and draw conclusions from multiple sources of data in order to inform future instruction and also provides examples of the complexity of the data tasks that teachers might encounter, both individually and in collaborative settings.

**Recommendations for Future Research**

The findings from this qualitative case study suggest four areas for potential future research. The first section addresses the need for additional research on how individual teachers make meaning of their collaborative experience over time. The second section speaks to the need to examine the long-term influence of collaborative data analysis on instructional practices and student learning outcomes. The third section speaks to the need to investigate the role of school size on the ways in which PLCs interact with student-learning
data. The fourth section suggests studying the use of frameworks for PLCs to collectively evaluate their work.

**Individual experience of collaboration over time.** The first recommendation for further research is to examine how teachers in PLCs make meaning of the experience over the course of years or even a career. This study examined the individual teacher experience over the course of a school year, with emphasis on the second semester of that school year. While the timeframe of a single year provides important insight into teachers’ experiences in PLC work, a longer-term study might provide a more nuanced view of the influence of collaboration on the teacher.

Follow-up research to the case studied in this research over the course of several years would provide additional insight on their experiences. Alternatively, a qualitative study could be designed to follow an individual teacher or a small number of teachers over the course of multiple years as they engage in professional collaboration. Such research could examine how their interpretation of their stance toward inquiry changed over the course of time, how their interpretation of supports and constraints on collaboration changed over time, or their views on resistant teachers over time. The results of such a study would provide important insight into how and why changes to the individual and collaborative inquiry stance came about. The study might also provide insight into how teachers perceive the influence of any changes in the stance toward inquiry on the overall professional culture of the school and the culture of learning in the school.

**Influence of collaborative data analysis processes over time.** A second recommendation for further research would be a long-term analysis of the ways in which collaborative data analysis influences changes in instructional practices and student
achievement over time. The participants in this study were at the beginning of their journey with using student-learning data as a source of inquiry into student understanding and instructional practices. Examining how instructional practices change over time and how student understanding and achievement is influenced over time would provide important context to the research on teacher collaboration. If the data analysis process does not result in perceived changes in instructional practices or measureable results in student achievement, the research would raise questions about the value of the resources devoted to collaboration. However, if the research found that teachers perceived changes in instructional practices and measurable increases in student achievement, the study would provide important insight into what specific collaborative practice and data analysis processes were effective.

A mixed-methods study that examines changes in instructional practices over time through qualitative methods and examines changes in student achievement with quantitative methods would provide important information for researchers seeking understanding about the impact of collaboration on instruction and student learning. The quantitative look at student achievement should look at local, state, and national assessments as measures of student understanding. The comparison between teachers’ qualitative description of instructional changes with the quantitative data on student achievement would provide insight into the ways in which collaboration influences instruction and student learning. Such a study might suggest specific collaborative practices that correspond to increased academic achievement.

**Influence of school size on the use of student-learning data in PLCs.** A third suggestion for further research would investigate the ways in which school size influences teachers’ perception of the use of student-learning data in their PLC. Through participant
responses in this study a theme emerged around the difficulty that teachers experience when using student-learning data when common courses are not shared among members of the PLC. The investigation of schools with similar experiences working in PLCs but of different school sizes might provide valuable information for schools of all sizes considering organizing into PLCs.

A comparative case study that examines two small high schools of similar size but with contrasting organization of collaborative teams might also provide valuable insight into ways in which to structure effective professional collaboration. It would be interesting to use similar research questions as were used in this study to examine a school with PLCs organized by department and a school with PLCs organized by grade-level teams. The comparative case study would help answer questions about the relative importance of sharing common courses or sharing common students when using student-learning data in PLCs.

The use of a conceptual framework as a collaborative reflection instrument. The final recommendation for further research is to explore the use of a conceptual framework such as the Two-Dimensional framework (Nelson et al., 2012) used in this study as a tool for individual teacher self-reflection or collaborative reflection on PLC work. Nelson and colleagues used their framework as outside facilitators working with PLCs (Nelson, 2009; Nelson et al., 2008). The framework was developed to evaluate the epistemological and dialogic stance toward student-learning data in multiple PLCs. The participants in this research often referenced their interpretation of how a PLC is supposed to function, but they did not have a common, tangible reference for their work. A framework might help teachers to be more aware of and better able to explain to colleagues their perception of the PLC’s
work. Teachers might use the framework as a basis for generating questions during collaboration.

A qualitative case study in which PLCs use a conceptual framework as an instrument for reflection over the course of an extended period of time would provide important insight into the ways in which the teachers’ stances evolve and the ways in which the collaborative stance evolves. Another option for research on the use of conceptual frameworks for reflection would be a comparative case study within a single high school in which one group of PLCs uses a framework for reflection on their collaborative work and another group of PLCs does not use such a framework. A comparison of the results of interview questions about the teacher experience in both groups of PLCs over time would be an important addition to the PLC literature because much like this study, such studies would foreground the teacher experience. In addition to examining teacher experiences, such studies might also incorporate an examination of how the use of frameworks for reflection result in changes in instructional practices and student achievement data.

**Conclusion**

Proponents of PLCs claim that collaboration among teachers is an important tool for teacher professional development that contributes to improved instructional practices and improved student learning. Little called these claims “a certain optimistic premise” (Little, 2003, p. 916). However, PLC research has found that school administrators and teachers struggle with implementing and sustaining PLCs that use data processes to engage in inquiry (Bocala & Boudett, 2015; Coburn & Turner, 2012; Datnow & Hubbard, 2015; Jimerson & Wayman, 2015; Spillane, 2012).
This qualitative case study is significant, because it provides insight into the ways that meaning is constructed through collective inquiry in a PLC. Specifically, this case study adds to the literature and understanding of the factors that contribute to a PLC being the site and source of professional inquiry and learning, based on evaluation of student-learning data by focusing on the ways in which individual teachers experience the PLC process. The focus on the individual teacher experience provides a deeper understanding of how the social setting of professional collaboration is built on individual knowledge, experiences, and perspectives. As Lave and Wenger (1991, p. 52) wrote, “…participation in social practice…suggests a very explicit focus on the person, but as person-in the-world, as a member of a sociocultural community.” This research examined teachers as people-in the-world as members of PLCs.

From a practical standpoint, the findings of this study help educators in the development of a more complete understanding of how teachers view and make meaning of their individual and collaborative inquiry stance toward student data. The findings are meaningful both to school leaders of schools with a PLC model in place, school leaders looking to implement PLCs, and school leaders searching for ways to revitalize the PLC process in their school setting.

The participants in this study indicated that while optimism existed within the school system about the benefits of collaboration, the optimistic premise has not been realized. The experiences described and observed in this case study show that teachers struggle to use student-learning data regularly to identify areas of potential collaborative inquiry. The struggle to use data was related to a lack of access to common assessments, shared students, or common courses. The struggle with data was compounded by the lack of a common
approach to collecting, sharing, and analyzing data. The lack of a data process inhibited the ability of the participants to engage in discussions of student understanding of the curriculum.

A key finding of this case study was the ways in which teachers’ stance toward knowledge and practice influenced their experience of professional collaboration. First, expert knowledge was privileged. Participant responses demonstrated a belief that a set of best practices existed, and the teachers were expected to learn these best practices and implement the practices in their work, both professional collaboration work and instructional work in the classroom. However, accompanying this belief was a sense of concern or frustration that the specific context of the school made implementation much more difficult than anticipated. That concern manifested in the second stance toward knowledge and practice, which privileged practical knowledge and teacher tenure. Teachers demonstrating this stance experienced the difficulty in implementation as proof that experts and external innovations can sometimes hinder learning rather than improve learning.

The frustration with the difficulty of implementation and the tension between different stances toward knowledge and practice have had tangible negative effects on the participants in this study. Social relationships were damaged. Some teachers sought compliance with perceived directives and mandates. Other teachers decided to resist those same directives. Still others remained committed to collaboration and waited for resistant teachers to leave the school so that replacements could be hired with compatible beliefs.

While the participants in this study faced many challenges in the collaborative work, their descriptions of their experiences provide reasons to remain optimistic about the premise of PLCs. Despite the difficulties and concerns expressed, all the participants expressed a
belief that collaboration with colleagues was important to them socially and professionally. Their concerns were with the nature of implementation, not collaboration. The new administrators were in the process of designing a master schedule that would allow for collaboration around common data, shared students, and common courses, and the majority of the participants viewed the new administration positively. The participant responses provide evidence that collaboration in the school is improving.

The results of this study revealed four practical strategies for school leaders to promote collaborative cultures in schools. These strategies include developing structures that support collaborative inquiry, developing a shared vision that supports collaborative inquiry, developing data processes that support authentic collaborative inquiry, and promoting political and social conditions that support collaborative inquiry. This study also revealed two implications for teachers who participate in PLCs. The strategies for teachers include on-going reflection on images of knowledge and practice and on-going engagement in learning. In addition, the findings revealed suggestions for the use of this case study in both administrator and teacher preparation programs.

The results of this case study add to the understanding of Professional Learning Communities. The findings suggest that in order for PLCs to empower teachers to pursue inquiry and generate knowledge to improve practice, care must be taken to fully understand the school context into which PLCs will be implemented in order for authentic collaboration to take place.
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APPENDIX A: INTERVIEW DOCUMENTS

Interview Protocol

[Participant],
For ease of note taking, at this time I would like to ask permission to record our conversation. The recording will be kept confidential and in a safe place. If at any time you would prefer that I turn the recorder off, please let me know and I will do so immediately. The recording of the interview will be transcribed. Do I have your permission to begin recording our discussion?

-Start recording if applicable-

Thank you. I have several main questions to ask you today. As we talk, I may think of follow-up questions as well. If at any time you do not wish to answer a question, or would like to end the interview, please let me know. I anticipate that our conversation will take about 45 minutes and probably will be shorter than that.

1. Did you receive the consent form that I mailed you a few weeks ago? Let’s walk through the form and then we will sign two copies, one for your records and one for my records. Do you give your consent at this time to participate in this study? Do you have any questions for me at this time?
2. Would you confirm that you have given permission for me to record this conversation [if participant has done so]?

(A) May I first confirm that you are a teacher or administrator that works as part of a PLC? [If not, end the interview, and thank this person for their time].

1. Please describe your role and responsibilities in the school.
2. How long have you worked in this school?
3. How do you describe the culture of learning at your school
   a. Students
   b. Adults

(B) I would next like to talk about the how PLCs operate at your school. Describe the process from your perspective.
1. What is your current philosophy on PLCs/Collaboration?
2. How has this changed over your career?
3. How do you define the work of a PLC?

(C) PLCs at your High School - What have been your experiences as you worked to build PLCs?
1. What are some celebrations you have experienced along the way?
2. What are some frustrations you have experienced along the way?
3. What are some turning points for you that happened along the way that brought you
to where you are today regarding PLCs?

(D) What kinds of supports are needed from administration or teacher leadership to support PLCs?
1. How do you view yourself as an adult learner?
2. What professional development have you received relating to PLC practices in the
   last four years?
3. What other types of support have you received?
4. What supports have been most helpful to you?
5. What supports would be most helpful to you?
6. What kinds of supports are most necessary for teachers beginning this process?
7. How are new members integrated into the PLC?
   a. What additional supports do new teachers need?
   b. How do new members change the dynamic of the PLC?
8. What are the barriers to implementing PLCs?
9. What help would be needed to break down these barriers?
10. How do you determine the level of administrative support needed by the PLC?
    a. How is this the same as or different from other areas of building leadership?
    b. How is teacher efficacy impacted by PLCs

(E) Describe your efficacy as a member of PLCs. (Efficacy defined as the capacity for
producing a desired result; effectiveness; quality of being successful in producing an
intended result)
1. How is this the same as or different from your other roles?
2. How does the PLC approach collective inquiry?
3. How does the PLC set learning goals and measure progress towards learning goals?
4. How does the professional learning in the PLC align with other professional
development?
5. How does the PLC use student data to make decisions on professional learning?
6. What changes in classroom instruction have you implemented as a result of the
   professional learning in the PLC?
7. How are instructional strategies discussed in the PLC?
8. Do members of the PLC participate in any type of peer review?
9. Have you grown as a teacher through because of your PLC participation?
   a. If yes, what evidence do you have to support this statement?
   b. If no, why not? What would have helped you grow?
10. Has the work of the PLC helped other teachers grow as learners and leaders?
    a. If yes, what evidence do you have to support this?
    b. If no, why not? What would help them grow?

(F) Conclusion: Is there anything else you want to tell me about your experiences with
PLCs?
1. What are “next steps” regarding your implementation of PLCs?
2. What guidance would you give to other educators as they build a culture of PLCs?
Thank you so much for participating in this interview. I appreciate your time today. After I look over the transcript of our conversation [or my notes, if permission is not given to record] may I contact you if I have further questions?

Thank you. If you have any further questions for me, please do not hesitate to contact me at any time.

Do you have my contact information?
APPENDIX B: CONSENT DOCUMENTS

INFORMED CONSENT DOCUMENT

Title of Study: Perceptions of Data Use in Professional Learning Communities

Investigators: Darin Haack, ISU doctoral candidate with assistance from Dr. Joanne Marshall

This form describes a research project. It has information to help you decide whether or not you wish to participate. Research studies include only people who choose to take part—your participation is completely voluntary. Please discuss any questions you have about the study or about this form with the project staff before deciding to participate.

Introduction

The purpose of this study is to learn more about the experiences of members of high school Professional Learning Communities. The following questions will guide the study:

1. How do individual teachers make meaning of the epistemological and dialogic aspects of their PLC’s inquiry stance towards student data?
2. How do teachers interpret the influence of their personal inquiry stance towards student data on the stance of their PLC?
3. How do teachers interpret the impact of external supports and constraints on their PLC’s inquiry stance towards student data?

Data collected will explore your experiences, the kinds of support necessary to implement Professional Learning Communities, and the outcomes of the PLC work.

You are being invited to participate in this study because you have been involved in this process at your school.

Description of Procedures

If you agree to participate, you will be asked to allow the researcher to observe one to three of your regularly scheduled PLC meetings. The researcher will collect observational data. The observational data will consist of field notes collected by the researcher during PLC meetings. The researcher will focus on how the meetings are structured, how the team discusses student data, and how the team uses student data to make decisions. While PLC meetings include discussion of student achievement, the
researcher won’t be collecting or reporting information about individual students. The researcher may write down a student name in order to track over time how the discussion of that student changes, but this research is not about what the student is doing, but instead it is about how you are making decisions about your students.

In addition to PLC observation, you may be asked to participate in two individual interviews. The interviews will last about 45 minutes each. If you agree to participate in an interview, you will be presented with the interview guide ahead of time (see attached interview guide for complete list of questions). The full interviews will be recorded on a digital voice recorder. You will be identified by a pseudonym for the study and your information will be protected before, during, and after this research project.

During the interview process, you may skip any questions that you do not wish to answer. Your participation will last for the amount of time that the interview takes. After the interviews, the audio recordings will be transcribed, and you will be presented with a copy of the transcripts for your review. This will be delivered in person or via an e-mail to the address that you provide to me. A follow-up interview may be requested.

After these steps, your participation will be over. At the conclusion of the dissertation research, you will be provided a write-up of the findings from the study.

**Risks or Discomforts**

While participating in this study you may experience the following risks or discomforts: There are minimal potential or anticipated risks for the participants for this study. Participant information will be kept confidential to the extent possible by law. Any sensitive information gained will be additionally protected by participant pseudonyms. The name of the school will be modified. Participation will be voluntary. You will be asked to comment on your experiences in a PLC, and not all PLCs will function at the same level. It could potentially cause embarrassment to discuss any level of dysfunction in the PLC. Maintaining participant confidentiality will protect participants from potential embarrassment.

During the interview, you will be asked to comment on your experiences participating in a professional learning community. It is possible that you could be embarrassed or be concerned about damaging relationships due to honest answers. Interviews will take place in a private setting to mitigate this risk. You will only be identified by pseudonyms. Strict confidentiality between participants will protect the participants.

The district’s permission to conduct research agreement requires that an abstract of the research findings be shared with the district.
Benefits

If you decide to participate in this study, there are no personal advantages to participation. It is hoped that the information gained in this study will benefit society by adding to the body of research about Professional Learning Communities and the kinds of support they need.

Costs and Compensation

You will not have any costs related to participating in this study, other than the time you spend during the interview and reviewing the interview transcript.

Participant Rights

Participating in this study is completely voluntary. You may choose not to take part in the study or to stop participating at any time, for any reason, without penalty or negative consequences.

Your choice of whether or not to participate will have no impact on you as an employee in any way.

If you have any questions about the rights of research subjects or research-related injury, please contact the IRB Administrator, (515) 294-4566, IRB@iastate.edu, or Director, (515) 294-3115, Office for Responsible Research, Iowa State University, Ames, Iowa 50011.

Confidentiality

Records identifying participants will be kept confidential to the extent permitted by applicable laws and regulations and will not be made publicly available. However, federal government regulatory agencies, auditing departments of Iowa State University, and the Institutional Review Board (a committee that reviews and approves human subject research studies) may inspect and/or copy study records for quality assurance and data analysis. These records may contain private information.

To ensure confidentiality to the extent permitted by law, the following measures will be taken: Identifying information will be not be reported, and pseudonyms will be used. The key of pseudonyms will be encrypted and password protected. Identifiers will be separated from the data during the written reporting process. All data will be stored in a locked filing cabinet or on whole-disk encrypted, password protected computer files. However, confidentiality cannot be guaranteed. It is possible that someone familiar with the school may be able to identify a participant.
Questions

You are encouraged to ask questions at any time during this study. For further information about the study, contact primary investigator Darin Haack, 515-249-9544 or Joanne Marshall, jmars@iastate.edu.

Consent and Authorization Provisions

Your signature indicates that you voluntarily agree to participate in this study, that the study has been explained to you, that you have been given the time to read the document, and that your questions have been satisfactorily answered. You will receive a copy of the written informed consent prior to your participation in the study.

Participant’s Name (printed) ________________________________

________________________________________________________________________

Participant’s Signature                     Date
APPENDIX C: OBSERVATION MATRIX

Observational Matrix

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Darin Haack
1022 NW Reinhart Dr.
Ankeny, IA 50023

Dear Project Participant:

Thank you for taking part in interviews for my Dissertation project: Perceptions of Data Use in Professional Learning Communities. I sincerely enjoyed our conversation about your experiences in your PLC.

I have attached the transcript from our interview sessions. Please take some time to read through the transcript. If you find passages or sections where the recording or the transcription do not accurately capture your thoughts, please let me know so I can correct the transcript.

Again, thank you for your participation in my Dissertation project.

Sincerely,

Darin Haack
APPENDIX E: IRB APPROVAL MEMO

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Date: 2/6/2017
To: Dr. Darin Haack
1022 NW Reinhard Dr
Ankeny, IA 50023

CC: Dr. Joanne Marshall
N229D Lacomandino

From: Office for Responsible Research

Title: Collective Inquiry Through Professional Learning Communities

IRB ID: 14-601

Approval Date: 2/6/2017
Date for Continuing Review: 2/16/2019

Submission Type: Continuing Review
Review Type: Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- Retain signed informed consent documents for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.
- Stop all research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- Complete a new continuing review form at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. Approval from other entities may also be needed. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. IRB approval in no way implies or guarantees that permission from these other entities will be granted.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 202 Kingland, to officially close the project.

Please don’t hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.