A Multi-Case Study Examining Reflection within Collaborative Teacher Inquiry

BY

RAMONA DECRISTOFARO
B.S. Ed, Northern Illinois University, 2003
M.S. Ed., Northern Illinois University, 2006
M.S. Ed., Northern Illinois University, 2008

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Defense Committee:

Shelby Cosner, Chair and Advisor
Michelle Parker-Katz, Special Education
Maria Varelas
Carole Mitchener
Victoria Trinder

ABSTRACT

Collaborative teacher inquiry is a learning process that is often conceptualized as involving teacher teams in the investigation of their own practice. Emerging research suggests that collaborative teacher inquiry can be enhanced through engagement in reflection, and more specifically critical reflection that challenges the learner to examine the consequences of current practices and explore alternatives while confronting her or his own biases and assumptions (Ash & Clayton, 2009; Brookfield, 2009; Closs & Antonello, 2011; Harvey, Coulson, Mackaway, & Winchester-Seeto, 2010; Leijen, Valtna, Leijen, & Pedaste, 2011; Mezirow, 1994; Smith, 2011). This is not surprising given that reflection and critical reflection have been found to support teacher learning more generally (Berghoff, Blackwell, & Wisehart, 2011; Cruickshank, Kennedy, Williams, Holton, & Fay, 1981; Harvey et al., 2010; Zhao, 2012). However, little is known about how the execution of a collaborative inquiry framework may advance or limit teacher reflection. This is particularly concerning given the importance of teacher learning as an antecedent to the kinds of robust changes in instructional practice that are likely necessary for school-wide improvement and the recent emphasis on and support for more authentic and embedded forms of teacher learning (Darling-Hammond, 2006; Tyack & Cuban, 1995; Spillane & Jennings, 1997). To address this and related questions, I drew from constructivist (Dewey, 1910), situated (Lave & Wegner, 1991), and transformative learning (Mezirow, 1991) theories that encourage learning from situated, authentic, and social perspectives to conduct a qualitative multi-case study that examined teacher teams across two school districts implementing a collaborative inquiry process as a means for promoting teacher learning. Specifically, this research examined whether and how enactment of collaborative inquiry and teacher conversational routines influenced reflection, while also investigating the teacher learning experiences and outcomes generated.

During the course of the study, teacher reflection proved difficult to quantify. Moreover, teacher teams did not engage in critical reflection, the highest level of reflection within the scope of collaborative inquiry. Certain factors related to the enactment of collaborative inquiry were found to promote or limit reflective dialogue more generally. Factors found to promote reflection included the visual representation of data across classrooms for comparison of instructional practices, the investigation of an instructional problem focused on teacher strategy, joint lesson planning, and the use of revising questions during team discussions. The utilization of protocols that guided teachers to consider past practices promoted pedagogical reflection, but was insufficient for cultivating critical reflection. Whether or how teams utilized student learning data was found to influence reflection. Reflection was limited when student learning data was not utilized or when teams used data for planning without consideration of past practice. Additionally, reflection was limited when teachers normalized a problem of practice without asking revising questions. Overall, the highest level of reflection observed within collaborative teacher inquiry was pedagogical reflection and teams that engaged in pedagogical reflection were more likely to experience transformative learning related to content and pedagogy which subsequently led to changes to instructional practices. Teacher learning and opportunities to make changes to practice were undermined when teacher reflection was limited to technical or non-reflective levels. Findings from this study suggest that the framing of collaborative inquiry and the enactment of components within the process, as well as teachers' conversational routines, are of consequence to reflection, teacher learning, and instructional outcomes.

This dissertation is dedicated to my mom, Lynne Topping Farrell, and my daughters, Edéa and Grace. My mom encouraged me to pursue the dream of earning my doctorate. Up until her passing in 2011, she was my biggest cheerleader. As an accomplished writer herself, she proofread almost every one of my graduate papers as long as she was able. Her absence was felt and she was sorely missed while writing this dissertation. It is because of her memory that I had the strength and motivation to persist through this work and I take comfort knowing she was with me in mind and spirit. Lastly, to my daughters—thank you for being my inspiration, reminding me what really matters and for making me laugh when I needed it. You make me proud every day and I encourage you to always follow your passions and never give up on your dreams.

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Chapter One: Introduction

Background for the Study

Teacher learning is a primary antecedent for improving instructional practices and must be of central consideration given the importance that teacher quality and instructional practices have on student achievement (Borko, 2004; Cochran-Smith & Fries, 2005; Cochran-Smith & Lytle, 2009; Darling-Hammond, 2000; Darling-Hammond & McLaughlin, 1995; Little, 2001; Rice, 2003; Timperley & Phillips, 2003; Zeichner & Noffke, 2001). Simply put, a school's performance cannot improve without increasing the capacity of teachers' knowledge, pedagogical skills, and understanding of students (Elmore, 2002). As a result, we must carefully think about how to best support teacher learning within the context of the school setting.

Spillane and Thompson (1997) argued that in order for teachers to change their practice, they must first reconstruct their knowledge, beliefs, and dispositions. They suggested that this kind of learning and "unlearning" consists of complex behavioral changes and requires the transformation of a great deal of what teachers already know, believe, and habitually do. Such reconstructive learning is necessary within a learning experience and is supported by sustained, honest, and collaborative interactions with others (Spillane & Jennings, 1997; Spillane & Thompson, 1997). Training-focused, traditional forms of teacher learning models, such as workshops or in-service trainings, are often designed in ways that do not offer strong support for teacher learning or the cultivation of instructional practice change (Borko, 2004; Darling-Hammond & McLaughlin, 1995; Garet, Porter, Desimone, Birman, & Yoon, 2001; Spillane & Thompson, 1997; Tyack & Cuban, 1995; Wilson & Berne, 1999). Existing research has had much to say about more effective forms of in-school learning and the fundamental elements of teacher learning activities that can promote such improvements in practice.

There has been general agreement regarding what should be considered fundamental attributes of teachers' professional learning designs and growing consensus that teacher learning and application of pedagogical and disciplinary knowledge are more likely when professional learning experiences are sustained, collaborative, inquiry-based, and provide opportunities for teachers to reflect (Ball & Cohen, 1999; Borko, 2004; Brand & Moore, 2011; Elmore, 2000; Garet et al., 2001; Wilson & Berne, 1999). As such, literature suggests that schools and districts should be broadening the design of traditional forms of teacher professional learning to include embedded, sustained opportunities that involve groups of teachers participating in reflective and inquiry-oriented activities about student-learning data, curriculum, and instruction (Clark & Hollingsworth, 2002; Darling-Hammond, 2006; Darling-Hammond & McLaughlin, 1995; Garet et al., 2001; Lumpe, 2005; Nelson, Slavit, & Deuel, 2012; Penuel, Fishman, Yamaguchi, & Gallagher, 2007; Webster-Wright, 2009). I examined one such embedded form of teacher learning—collaborative teacher inquiry—as a central teacher learning approach enacted in two schools in one Midwestern state.

Collaborative teacher inquiry is a more formalized collaborative approach to teacher learning that is receiving increased attention and utilization as it exhibits many of the fundamental elements identified in effective professional learning approaches (Horn & Little, 2010; Levin & Rock, 2003; McLaughlin & Talbert, 2006; Sagor, 2010). It is a process that stems from the tradition of action research and is rooted in the work of John Dewey's scientific model of inquiry (Biesta & Burbules, 2003; Cunningham, 2011). Professional learning communities (Dufour, 2004; Louis & Kruse, 1995), action/practitioner research (Cochran-Smith & Lytle, 2009), lesson study (Cerbin & Kopp, 2006; Fernandez, Cannon, & Chokshi, 2003), and Critical Friends Groups (Curry, 2003, 2008; Little, Gearhart, Curry, & Kafka, 2003) are some of the

more common, yet varied approaches subsumed within the broader concept of collaborative teacher inquiry and will be described further in the next chapter. These professional learning approaches share many of the same attributes and goals and emphasize collaboration and reflection as central to the learning process, yet tend to follow slightly different processes. For this research, collaborative teacher inquiry is defined as a systematic and cyclical learning process of action-oriented and reflective behaviors in which educators work in teams in order to investigate their individual practices in relation to a specific issue or goal for improvement as they plan for future instruction.

As I examined teacher teams engaged in collaborative inquiry, I made the choice to pay attention to whether and how teachers reflected during the collaborative inquiry process. I made this choice for several reasons. Of importance, reflection has been found to support teacher learning generally (Hatton & Smith, 1995; Larivee, 2008; Osterman & Kottkamp, 1993; Rogers, 2002; Schön, 1983; Zeichner & Liston, 1996) and has been identified as an important element of collaborative inquiry processes (Hagevik, Aydeniz, & Rowell, 2012; Reid, 2004; Wesley & Buysse, 2001; Zimmerman, 2009). Moreover, although critical reflection, both within and outside the context of collaborative inquiry, has been linked to transformative learning and changes to practice (Berghoff, Blackwell, & Wesehart, 2011; Branch, 2010; Cruickshank et al., 1998; Lucas, 2012; McAlpine & Weston, 2000; Smith, 2011), critical reflection has been noted as often absent in teacher learning experiences (Hagevik et al., 2012; Orland-Barak, 2007; Sung, Chang, Yu, & Chang, 2009) and underrepresented among collaborative teacher teams (Hagevik, Aydeniz, & Rowell, 2012). These authors advocated making critical reflection skills explicit early in the collaborative inquiry process and suggested that developing skills of critical

reflection during collaborative inquiry will best equip teachers for addressing the problems they will face in their classrooms.

Defining and making a distinction between reflection and critical reflection in the context of collaborative teacher inquiry is an important initial step toward understanding the role of reflection in the process. Reflection is often differentiated in the literature by levels. As I explore reflection and critical reflection in this study, I use the generic term "reflection" to apply to any level of reflective activity ranging from describing past teaching events to seeking to explore and understand a teaching and learning issue. Reflection is a meaning-making process that is systematic, rigorous, and disciplined (Dewey, 1910) and can occur either in the moment, "reflection-in-action," or after an activity, "reflection-on-action" (Schön, 1983). An essential aspect of reflection includes the examination of a teaching experience. I differentiate reflection among four levels: non-reflective, technical, pedagogical, and critical. These four levels are defined and elaborated on in the next chapter.

Definitions of critical reflection vary and, depending on one's perspective, can mean very different things (Brookfield, 2009; Gardner, 2009; Harvey et al., 2010; Lucas, 2012; Mezirow, 2000; Smith, 2011). Researchers agree that not all reflection is critical and critical reflection is considered to be at a higher level, going a step beyond by challenging the learner to confront and understand her or his own biases and assumptions (Berghoff, Blackwell, & Wisehart, 2011; Harvey et al., 2010). According to Ash & Clayton (2009), reflection becomes "critical reflection" when it generates, deepens, and documents learning through questioning that confronts bias, challenges simplistic conclusions, invites alternative perspectives, contrasts theory with practice, and points to systematic issues. They defined critical reflection as "an evidence-based examination of the sources of and gaps in knowledge and practice, with the intent to improve

both" (Ash & Clayton, 2009, p. 28). Critical reflection involves a deliberate process in which the teacher takes time to focus on his or her performance and the thinking that led to particular actions, what happened, and what was learned from the experience in order to inform future actions (King, 2002). The term critical reflection is most commonly defined in the literature as a level of reflection that examines the ethical, social, and political consequences of one's actions (Larivee, 2008). My definition of critical reflection was shaped by the most frequently used perspective that involves the examination of ethical, social, and political consequences of one's practice (Day, 1993; Farrell, 2004; Jay & Johnson, 2002; Larivee, 2008; Van Manen, 1977). For this research, critical reflection is defined as teachers confronting their assumptions and underlying beliefs, reflecting on the ethical, social, and political implications and consequences of their actions by questioning commonly-held patterns of practice, and observing themselves and their thinking processes.

Recent studies examining learning activities designed to promote critical reflection are encouraging and have shown that teachers participating in critical reflection-enhancing activities have achieved a range of positive outcomes (Garcia, Sanchez, & Escudero, 2006; Harrison, Lawson, Wortley, 2005; Lin, Hong, Yang, & Lee, 2013). General learning activities that have been found to promote critical reflection include narrative storytelling (Allard, Goldblatt, Kemball, Kendrick, Millen, & Smith, 2007; Chin, 2004), video recording instruction followed with analysis of observed instruction (Copeland & Decker, 1996; Ermeling, 2010; Koellner, Jacobs, & Borko, 2011; Lave & Wenger, 1991; Levine & Marcus, 2009; Lin, Hong, Yang, & Lee, 2013; Little, 2002, 2003; Whitehead & Fitzgerald, 2007), journaling (Darling-Hammond & Snyder, 2000), and portfolio development (Sung, Chang, Yu, & Chang, 2009; Orland-Barak, 2007; Zeichner & Wray 2001). Activities within the context of collaborative inquiry that have

been found to promote critical reflection include peer observation and group discussion (Lave & Wenger, 1991; Levine & Marcus, 2009; Lin et al., 2013; Little, 2002, 2003), and following structured inquiry protocols (Berghoff et al., 2011; Gallimore, Ermeling, Saunders, & Goldenberg, 2009; Levine & Marcus, 2009; Little, Gearhart, Curry, & Kafka, 2003; Nelson, 2008).

Earlier studies linking critical reflection to positive outcomes shaped my decision to pay attention to the impact critical reflection has on teacher learning and changes to practice during collaborative inquiry. This is less well understood, particularly because critical reflection is largely absent among collaborative teacher teams. Prior research examining critical reflection generally and within collaborative inquiry has found that critical reflection has positively influenced teachers' ability to articulate reasons behind instructional decisions (Cruickshank, Kennedy, Williams, Holton, & Fay, 1998), incorporate professional values into teaching (Branch, 2010), challenge the authoritative advice of experts (Berghoff, Blackwell, & Wesehart, 2011), and improve thinking, learning, and assessment of self and social systems within the classroom (Lucas, 2012; McAlpine & Weston, 2000; Smith, 2011). While reflection has been associated with teacher learning more generally, critical reflection has been connected to transformative teacher learning (Harvey, Coulson, Mackaway, & Winchester-Seeto, 2010; Mezirow, 1991; Zhao, 2012).

Given my interest in understanding the factors that shape teacher reflection during collaborative inquiry, I focused my attention in two particular ways. First, I paid attention to the specific enactment of components in the inquiry process. Next, I paid attention to conversational routines that emerged between teachers and how these influenced reflection. Again, a range of issues shaped these decisions. First, less is known about how collaborative inquiry processes

influence, shape, and cultivate teacher reflection. Second, recent work by Horn and Little (2010) has suggested that certain conversational routines during teacher collaboration are consequential to teacher learning and impact opportunities to access, conceptualize, and learn from problems of practice. Further, relatively little is known about the difficulties, practicalities, and methods of facilitating reflective dialogue during teachers' conversations (Brockbank & McGill, 1998; Chin, 2004; Finley & Gough, 2003; Hsiung, 2008; Larivee, 2008; Leijen et al., 2011; Smith, 2011). This points to the need for a better understanding of the conversational routines that promote group reflective processes around an instructional issue that avoids reducing reflection to a checklist of behaviors (Dana, Yendol-Silva, & Snow-Gerono, 2005; Nelson & Slavit, 2007; Poekert, 2010; Rodgers, 2002; Timperley & Parr, 2007: Wood, 2007).

Purpose of the Study and Research Questions

The purpose of this study is to better understand how enactment methods, including tools, protocols and teacher talk might shape and advance reflection within the context of collaborative inquiry and the impact of reflection on teacher learning. The following questions emerge from my understanding of the gaps in literature specific to reflection within the collaborative teacher inquiry process:

1. How does the enactment of components within a collaborative inquiry process influence whether or how teachers reflect about their prior instructional practices?
2. What conversational routines among collaborative teacher inquiry teams promote or limit reflection?
3. In what ways does engagement in different levels of reflective dialogue during collaborative inquiry impact teacher learning and instructional outcomes?

Significance of the Study

Teacher learning is an important precursor to improved instructional practices; changes and improvements in instruction are more likely to occur when teachers engage in critical reflection and learning activities that are collaborative, ongoing, and occurring in the context of their own classrooms (Brand & Moore, 2011; Brookfield, 2009; Closs & Antonello, 2011; Elmore, 2000; Garet, Porter, Desimone, Birman, & Yoon, 2001; Leijen, Valtna, Leijen, & Pedaste, 2011; Lucas, 2012; Mezirow, 1994; Smith, 2011; Wilson & Berne, 1999). Existing research on reflection has pointed to certain conditions and activities that promote critical reflection (Garcia, Sanchez, & Escudero, 2006; Harrison, Lawson, Wortley, 2005; Lin, Hong, Yang, & Lee, 2013). However, empirical studies that offer insight into the methods for promoting reflection, specifically within the context of collaborative teacher inquiry, are lacking. A better understanding of how to promote reflection among teacher groups engaging in the inquiry process, will advance teacher learning and address the knowledge gaps in the existing literature related to how collaborative inquiry and teachers' conversations influence reflection. My study aims to contribute to the limited but growing knowledge base dedicated to understanding reflection and collaborative teacher inquiry, providing key considerations to those responsible for designing and facilitating professional learning experiences for teachers. By examining methods for advancing reflection within teacher teams, schools and educational leaders will be better prepared to promote teacher learning that fosters improvements and moral considerations in instructional practices.

Definition of Terms

Analysis. A component of collaborative inquiry where teachers observe, learn from, and make sense of the effects of an action as a basis for further planning and subsequent actions (Ermeling, 2010; Kemmis, McTaggart, & Retallic, 2004; Nelson et al., 2012).

Collaborative inquiry. A systematic and cyclical learning process of action-oriented and reflective behaviors in which educators work in teams in order to investigate their individual practices in relation to a specific issue or goal for improvement as they plan for future instruction.

Collegial conversations. Conversations that move beyond superficial talk to challenge a group to explore deeper meanings for the purpose of improvement (Timperley & Earl, 2009)

Conversational routines. Patterned and recurrent ways that conversations unfold within a social group. Routines are composed of turns of talk that influence the conversation to either set up or constrain the response of subsequent speakers. (Horn & Little, 2010)

Critical reflection. A particular form of reflection that is defined for this research as teachers confronting their assumptions and underlying beliefs, reflecting on the ethical, social, and political implications and consequences of their actions by questioning commonly-held patterns of practice, and observing themselves and the processes of their thinking.

Developing a shared vision. A component of collaborative inquiry where teams define a common student learning goal or outcome. (Kemmis, McTaggart, & Retallic, 2004; Nelson et al., 2012)

Formative assessment. A range of formal and informal assessments conducted during the student learning process and used for teacher learning and understanding in order to modify instructional activities.

Inquiry. Any formal model teachers use to question and reflect upon prior practices in an attempt to learn from and improve instruction and student learning. (Dana & Yendol-Hoppey, 2008).

Inquiry protocols. Tools that provide structure and processes that help groups achieve deep understanding and facilitate inquiry-oriented dialogue that may lead to learning and effective decision making. (Cunningham, 2011; Dana & Yendoll-Hoppey, 2008; Easton, 2009; Gallimore et al., 2009).

Making practice public (deprivatization of practice). Teachers share, observe, and discuss each other's teaching methods and philosophies. This involves making the actions of teaching visible or understood by others (Clauset & Murphy, 2012; Kruse, Seashore, & Bryk, 1995; Levine & Marcus, 2010).

Narrative storytelling. Teachers constructing stories and then examining those stories for assumptions inherent in the shaping of the stories, providing a window into their beliefs and experiences (Bell, 2002).

Peer observation. Teachers observing each other in the classroom and then discussing the lesson, providing feedback and ideas about what was observed.

Planning for action. A component of collaborative inquiry where teams are guided by evidence to plan for implementation of teacher strategies addressing a shared vision or goal (Ermeling, 2010; Kemmis, McTaggart, & Retallic, 2004).

Problem identification. A component of collaborative inquiry where teams identify an important problem worthwhile of examination and specific to the local context of the participating teachers (Ermeling, 2010; Saunders, Goldenberg, & Gallimore, 2009).

Reflection. A broad term that has been used to describe practices ranging from analyzing a single aspect of instruction to considering the ethical, social, and political implications of teaching practice (Larivee, 2008). Some scholars have identified different forms or levels of reflection, including, but not limited to, surface reflection, pedagogical reflection, and critical reflection.

Reflective dialogue. Teachers talking about their situations and the specific challenges they face. The discussion involves an exploration and critique of their teaching practices (Kruse, Seashore, & Bryk, 1995).

Shared norms and values. Through words and actions, teachers affirm common collaborative norms and values concerning educational issues.

Standardized assessment. A test used to measure student achievement where all students answer the same questions and administration and scoring are consistent.

Student data. Any form of student information used to understand student learning and which may include student work, student questionnaires, student self-assessments, portfolios, systematic classroom observations, test results, and video.

Student work. Any work that a student has completed as part of a classroom assignment, including, but not limited to, writing samples, completed graphic organizers, worksheets, and portfolios.

Summative assessment. An assessment used to evaluate student learning and achievement at the conclusion of a defined instructional period (e.g. end of unit).

Tier 1. Instruction that is part of the Core Curriculum and made available to all students.

Tier 2. Supplemental interventions for students that may be at risk. Tier 2 interventions often involve targeted groups for a specified period of time.

Training-focused professional development. Traditional forms of teacher learning models, such as workshops or in-service trainings, that are often designed in ways that do not offer strong support for teacher learning or the cultivation of instructional practice change (Garet, Porter, Desimone, Birman, & Yoon, 2001). Many times these approaches to teacher learning involve an outside expert training teachers at a one-time workshop or conference. This model often constructs teachers as implementers of plans, policies, and products developed by others (Reid, 2004).

Transformative learning. The process of effecting change in a frame of reference. It is a learning process by which individuals transform taken-for-granted frames of reference to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action (Mezirow, 1991).

Chapter Two: Literature Review

This chapter is a review of the research and literature that relate to my study on collaborative teacher inquiry and promoting reflection within that process. First, I begin with a discussion of how teacher learning practices have evolved, and the theoretical perspectives that have influenced collaborative teacher inquiry as a design to support teacher learning. Second, I highlight the benefits of collaborative inquiry and provide a discussion of the variability among a range of collaborative inquiry approaches, describing some of the more common forms of collaborative inquiry documented in existing scholarship. The more common forms of inquiry highlighted in this section include: (a) action and practitioner research (Cochran-Smith & Lytle, 2009); (b) professional learning communities (Dufour, 2004; Louis & Kruse, 1995); (c) Critical Friends Group (Curry, 2003; 2008; Little, Gearhart, Curry, & Kafka, 2003); and (d) lesson study (Cerbin & Kopp, 2006; Fernandez, Cannon, & Chokshi, 2003). Third, drawing upon the work of Cochran-Smith and Lytle (1993), Ermeling (2010), Kemmis and McTaggert (1988), and Nelson et al., (2012), I provide my own definition of collaborative teacher inquiry. Fourth, I expand on my earlier discussion of critical reflection given the empirical evidence available on what is known and unknown about the learning outcomes of critical reflection generally, and more specifically within collaborative inquiry groups. Fifth, I discuss varying components within collaborative inquiry that have been identified as important by different scholars (Ermeling, 2010; Kemmis & McTaggert, 1998; Nelson et al., 2012). These perspectives helped shape my decision to focus my attention on certain components within collaborative inquiry during this study. Sixth, I summarize the research on the conditions that have been found to support collaborative inquiry. This is followed by a presentation of the focal components within the collaborative inquiry process that I have identified for this study and a discussion about what is

known about each component. This section includes a discussion of five components: (a) problem identification, (b) developing a shared vision, (c) planning for action, (d) analysis, and (e) making practice public. Following this, I present research about designing reflective learning experiences for teachers. As I examined collaborative teacher inquiry, I paid attention to the conversational routines in relation to the four levels of reflection. I chose to focus on reflection as it has been found to be of value to teacher learning, but little is known about ways of promoting reflection and critical reflection particularly is very rare among teacher teams. Finally, I present current research on how conversational routines influence teacher learning, followed by a discussion of the impact trust has on collegial conversations. This section also includes information about what is understood about how the role of a facilitator, discussion techniques, and inquiry protocols utilized during collaborative inquiry influence reflection.

Evolving Understanding of Teacher Learning

Over the last two decades, interest in collaborative inquiry and teacher reflection has increased as we have come to understand more about how teachers learn. Methods for promoting teacher learning have varied, and some approaches have proven more effective than others. For example, traditional training-focused professional development methods have shown to be somewhat effective in bringing about surface-level classroom changes such as use of curriculum materials or ways in which teachers group their students (Tyack & Cuban, 1995). However, research has indicated that more traditional training-focused approaches are much less effective in reforming difficult-to-reach classroom dimensions such as teacher questioning techniques or the types of discussions and exercises in which students engage (Spillane & Jennings, 1997). Clark and Hollingsworth (2002) described such forms of professional development as being based on a deficit-training-mastery model aimed at addressing teaching mastery of prescribed

skills and knowledge. They suggested that the ineffectiveness of such models provided motivation for more research related to the process of teacher learning that brings about changes and improvements to practice.

Recognizing the ineffectiveness of earlier methods of professional training models, shifts have been made and recent emphasis placed on providing teachers with opportunities to become active participants in shaping their learning and professional growth (Butler & Schnellert, 2012; Clark & Hollingsworth, 2002; Horn & Little, 2010; Lieberman, 1995). Tyack and Cuban (1995) suggested focusing on ways to improve instruction from the inside out by having teachers take an active role in their learning and connecting it with their current teaching practices; they pointed out that behind the classroom door, teachers remain the key influencers over instruction. While terms vary in describing the changes being emphasized in recent teacher learning models, at the core of these perspectives are the concepts of teachers as learners and schools as learning communities (Clarke & Hollingsworth, 2002). There has been general agreement suggesting that fundamental elements of more robust teacher learning designs include activities that are collaborative, embedded, and directly connected to teachers' work and practice, sustained over time, and that encourage teachers to reflect on past practices (Clark & Hollingsworth, 2002; Darling-Hammond, 2006; Garet, Porter, Desimone, Birman, & Yoon, 2001; Nelson et al., 2012; Penuel, Fishman, Yamaguchi, & Gallagher, 2007; Webster-Wright, 2009).

Reflective practice has become known as a significant feature of teacher professional learning experiences (Dana & Yendol-Hoppey, 2008; Drago-Severson, 2009; Moran, 2007). These educators and scholars believe that teachers who engage in reflective practice will achieve learning benefits that will support the improvement of their instructional practice and, in turn, enhance student learning and achievement (Ball & Cohen, 1999; Cochran-Smith, 2009; Elmore,

2000; Elmore & Burney, 1999; Fullan, 2005). According to Darling-Hammond and McLaughlin (1995), professional development should provide "occasions for teachers to reflect critically on their practice and to fashion new knowledge and beliefs about content, pedagogy and learners" (p. 597). Researchers have suggested that reflection during collaborative inquiry is different than daily reflection in two important ways. First, reflection in teacher inquiry is intentional and planned to heighten focus on problem posing (Rodgers, 2002). Second, reflection in teacher inquiry is more visible. As teachers engage in the process, their thinking and reflections are made public for discussion, debate, and purposeful conversation (Dana & Yendol-Hoppey, 2008). Dewey (1910) made a distinction between routine action and reflective action by characterizing routine action as being guided by impulse, tradition, and authority, whereas reflective action involves active, persistent, and careful consideration of any belief or practice. According to Dewey, the reflection process begins when teachers experience a difficult situation that cannot be immediately resolved, prompting a sense of uncertainty that requires teachers to step back and analyze their experiences (Zeichner & Liston, 1996).

The subject of my research is one form of teacher learning referred to as collaborative teacher inquiry, which is a teacher learning process generated by the recent shifts and recommendations in teacher learning practices. Collaborative teacher inquiry is often conceptualized as a systematic process in which teams of teachers engage in a cycle of action-oriented and reflective behaviors as a means of examining and improving their practice. Both constructivist and situated learning theories have shaped the recent shifts in teacher learning practices and offer support for collaborative teacher inquiry as a useful approach to teacher learning.

Theories Informing Collaborative Inquiry

Collaborative inquiry has emerged from constructivist and situated learning perspectives and theorists who concluded that learning can be supported when it is done collaboratively and when it is embedded and situated in teachers' everyday experiences (Dewey, 1933; Lave & Wenger, 1991). These long-standing learning theories have significantly influenced education and our understanding of how people learn, building the foundation for collaborative inquiry.

Constructivist learning theory. Jean Piaget (1972) is known as the founder of constructivist learning theory, though constructivism was subsequently influenced by the socio-historical work of Lev Vygotsky (1978) and other theorists, including John Dewey (1933) and Jerome Bruner (1990) (as cited in Fosnot, 1996). Constructivist theory is a learning process in which the student experiences an environment first hand and is then required to act upon that environment to both acquire and test new knowledge (Glaserfeld, 1989). A fundamental principle of constructivism involves connecting what we learn from past experiences with new information. Learning occurs as individuals construct new understandings or knowledge through interaction with and reflection on what they already know and believe (Abdal-Haqq, 1999). Constructivists believe that understanding builds upon prior knowledge, interests, and experiences and that learning is more effective when students are actively engaged and constantly reflecting and assessing their own learning (Callison, 2001). From a constructivist perspective, learning occurs when individuals are actively involved in the process of building their knowledge about the world around them through experiences and social interactions.

Collaborative teacher inquiry attempts to cultivate a constructivist approach to learning by recognizing the importance of the learner as an active participant and constructor of his or her own knowledge. Both collaborative inquiry and constructivism emphasize social interaction,

reflection, and questioning as integral to the process of learning. According to Kimble, Yager, and Yager (2006), staff-development models that are structured using constructivist approaches are more likely to yield teacher participants who can carry those methods back to their classrooms. Howe and Stubbs (1996) found that teachers' changes in instructional practices resulted from constructing their knowledge in a supportive social context with time for reflection and revision. Collaborative teacher inquiry may be relatively new to the field gaining momentum through the work of such scholars as Cochran-Smith and Lytle (1993) and Carr and Kemmis, (1986); however, the principles and constructivist theories that it is derived from have long been part of educational discourse.

Situated learning theory. Situated learning theory was developed by Jean Lave and Etienne Wenger (1991) and emphasizes social participation and relationships. Lave and Wenger (1991) contended that learning is a social process where knowledge is co-constructed and should not be viewed as simply the exchange of abstract and decontextualized knowledge from one individual to another. They believed that learning is situated, meaning it is a function of the activity, context, and the culture in which it occurs. From this perspective, learning is not merely the acquisition of knowledge, but a process of social participation that is impacted significantly by the situation. Vygotsky's (1978) social development theory is a key component of situated learning theory (Bockarie, 2002). Vygotsky saw development as a continuous process that integrated teaching and learning. He believed that social interaction plays a fundamental role in the development of cognition and that learning occurs through our interactions, observations, communications, and reflections on activities of daily life with others (Vygotsky, 1978). Advocates of situated learning contend that learning requires social interaction and collaboration and that knowledge needs to take place in an authentic context (Brown, Collins, & Duguid;

1989).

While situated learning theory has influenced collaborative inquiry in many ways, there are key differences. Similar to situated learning perspectives, the collaborative teacher inquiry process is designed to be authentic and social, placing high value on what can be learned from reflecting critically and listening to other perspectives. Lave and Wenger (1991) argued that novices learn from the socio-cultural practices of the community and gain competence through knowledge and skill development acquired from those positioned as masters. The goal being that as individuals become more competent, they move from legitimate peripheral participation towards full participation. This view of learning has promoted professional learning models and social learning frameworks emphasizing community, learning for meaning, and teacher identity development (Wenger, 1998). One distinction that can separate situated learning perspectives from collaborative inquiry is that according to situated learning perspective, the group is formed organically through common interests and learning does not necessarily require intentionality (Wenger, 1998).

Collaborative Inquiry and Its Benefits

Collaborative inquiry is one of many contemporary approaches to teacher learning that draws upon constructivist and situated learning theories. Collaborative teacher inquiry is often conceptualized as the search for knowledge and solutions through the "systematic and intentional study of practice" (Cochran-Smith & Lytle, 1990, p. 83). Advocates of collaborative inquiry emphasize the social aspect of learning and recognize the value in analyzing teaching experiences through multiple perspectives (Cunningham, 2011). Though collaborative inquiry models vary, most involve teacher teams engaging in a cycle of reflective and action-oriented behaviors in order to learn more about and address a topic, question, or problem related to their

own instructional practices (Butler & Schnellert, 2012).

Many scholars have encouraged reflection during a collaborative inquiry cycle (Cunningham, 2011; Dana & Yendol-Hoppey, 2008; Reid, 2004) and note the importance of "reflection-on-action," "reflection-in-action" (Schön, 1983), and "reflection-for-action" (Gibbs, 1988). As teachers plan for instruction, it is important that they reflect on prior instructional practices (reflect-on-action) as they consider the efficacy of those practices and make adjustments to future instruction (reflect-for-action). As teachers implement a plan during the process of teaching, they "reflect-in-action," and adjust their actions as they monitor the needs of the students and classroom environment. Teachers engage in a cycle of these reflective behaviors and discuss adjustments, next steps, and new questions.

I have drawn upon literature that extends across the range of collaborative inquiry approaches (Cochran-Smith & Lytle, 1999; Dana & Yendol-Hoppey, 2008; Dufour, 2004; Gallimore et al., 2009; Kemmis & McTaggert, 1988; Lave & Wenger, 1991; Little et al. 2003; Louis & Kruse, 1995; McLaughlin & Talbert, 2006; Nelson et al., 2012; Sagor, 2010; Timperley & Parr, 2007), and I am most interested in the work associated with action and practitioner research (Cochran-Smith & Lytle, 1999; Kemmis & McTaggert, 1988; Nelson & Slavit, 2008). Though various frameworks exist, most models of action research involve teachers engaging in a cycle of essential behaviors that typically include planning, acting, observing, and reflecting in iterative cycles (Butler & Schnellert, 2012; Kemmis & McTaggert, 1988). Kemmis, McTaggart, and Retallic (2004) described these four "moments" of action research as: (a) developing a plan of action to improve what is already happening which includes identifying a problem, developing a shared goal and a plan for implementation; (b) acting to implement the plan; (c) observing the effects of the action; and (d) and critically reflecting on the effects as a basis for further planning

and subsequent action through a succession of cycles. There is variability among scholars about whether these collaborative inquiry activities are sequenced in a particular order. Some have envisioned these activities as stages or steps to be followed in order (Ermeling, 2010; Nelson et. al, 2012; Sagor, 2010) while others have placed less emphasis on the sequence, suggesting the components are not meant to be fixed steps (Kemmis, McTaggart, & Retallic, 2004). I consider collaborative teacher inquiry to involve teacher teams cycling through these or similar activities systematically while engaging in ongoing reflective dialogue that requires teachers to analyze and make meaning of past instructional experiences and student learning in order to plan for future instruction.

The benefits of collaborative inquiry are well documented and include improved teacher learning and the development of teachers' personal and professional capacities. Research has indicated that strong professional learning communities, such as collaborative inquiry teams, can foster teacher learning and instructional improvement that support teachers' professional development (Borko, 2004; Little, 2003; Wilson & Berne, 1999). According to Cunningham (2011), collaborative inquiry fosters the development of important teacher dispositions such as working for a deeper understanding, developing intellectual perseverance, committing to reflective practice, building a commitment to collaborative and collegial work, recognizing and honoring others' expertise, and innovative risk-taking. These dispositions support professional learning, contribute to the leadership capacity, and improve the culture of a learning organization, which contributes to sustainable growth (Martin-Kniep, 2007; Cunningham, 2011).

Variability Among Collaborative Inquiry Designs

There is a wide range of inquiry models that vary in design and emphasize different components within a process. Researchers of collaborative inquiry have suggested that

conditions for improving teaching and learning are advanced when teachers collectively question ineffective instructional practices, examine new ideas, generate means to acknowledge and address conflict, and participate actively in supporting professional growth (Little, 2003; Timperley & Earl, 2009). Most inquiry models strive to meet those conditions. In this section, I have drawn upon a wide range of sources to summarize the models of collaborative inquiry that are most similar and have contributed to the definition of collaborative teacher inquiry that I present in this research. While these models share certain similarities, there are a few important ways in which they differ. First, the pacing of these models varies. For example, some models may complete an inquiry cycle during each meeting and focus on a different topic every time they meet (e.g. Critical Friends Group) while other models may complete a cycle or multiple related cycles over a longer period of time. Second, some models have very specific structures and steps to follow during each meeting (e.g. Critical Friends Group), while others are less structured, allowing for some flexibility and autonomy in the enacting of components within the process (e.g. professional learning community). Third, some models include very specific roles for group members (e.g. Critical Friends Group), and others are less specified (e.g. professional learning community and action research). For each form of inquiry, I include a description, elements of the process, potential benefits, limitations, similarities, and differences among the various forms.

Action and practitioner research. Action and practitioner research has been examined from a range of perspectives and has been defined by Cochran-Smith and Lytle (1993) as a "systematic and intentional inquiry carried out by teachers" (p. 7). Action research has also been described as research that teachers do to investigate their own practice in order to understand and improve their work (Levin & Rock, 2003). Waterman, Tillen, Dickson, and de Koning (2001)

describe action research as problem-focused, context-specific, and future-oriented. Kemmis and McTaggert (1988) defined critical action research and suggested that there are four fundamental aspects that should be present in all cycles of action research: planning, acting, observing, and reflecting. Carson (1990) also identified these four components, citing that this process sets critical, reflective action research apart from ordinary problem solving. These four aspects in action research end up in a cycle, and ultimately in a spiral of such cycles. Sagor (1992) noted that during the cycle of the collaborative action research process, the practitioners define the focus of the research themselves. He argued that two guidelines must be followed: (a) the phenomena chosen for study must concern the teaching and learning process, and (b) those phenomena must also be within the practitioner's scope of influence. A practitioner who engages in his own research is partaking in a continual process of self-education (Schön, 1983), while also contributing to the development of his own profession (Sagor, 1992). Most versions of action research share a sense of the teacher as knower and agent for change (Cochran-Smith & Lytle, 2009). A key difference between action research and other forms of inquiry described in the literature is that it isn't limited to collaborative enactment. However, when implemented collaboratively, I view action research as synonymous with collaborative teacher inquiry. Several educational researchers claim that teachers who conduct action research are better informed about their field, understand themselves better as teachers and make better instructional decisions (Levin & Rock, 2003).

Professional learning communities. One of the most popular forms of inquiry-oriented teacher learning being discussed in the educational field today is characterized by the term, professional learning community (PLC). While there is no universal definition of professional learning communities, there appear to be some attributes or characteristics that are cited more

often. Stoll, Bolam, McMahon, Wallace and Thomas (2006) drew upon the literature to summarize a PLC as "a group of people sharing and critically interrogating their practice in an ongoing, reflective, collaborative," and learner-oriented way, with the goal of enhancing each other's and students' learning as well as school development (p. 223). Similarly, McLaughlin and Talbert (2006) used the term teacher learning communities, and described them as teachers working "collaboratively to reflect on practice, examine evidence about the relationship between practice and student outcomes, and make changes that improve teaching and learning for the particular students in their classes" (p. 4).

Louis and Kruse (1995) found that certain components, structural conditions, and social characteristics influence a professional learning community's ability to impact student achievement. They identified five critical components present in strong professional learning communities that are not meant to be fixed steps within the process. The five components identified by Louis and Kruse include: (a) reflective dialogue; (b) de-privatization of practice; (c) collective focus on student learning; (d) collaboration; and (e) shared norms and values. Louis and Kruse (1995) also suggested the following structural conditions must be met in order to support PLCs: time to meet and talk, physical proximity of the staff (increasing teacher contact), interdependent teaching roles (e.g. team teaching), communication structures that encourage an exchange of ideas, school autonomy, and teacher empowerment. Finally, they found that the following social characteristics of teacher team members could enhance PLCs: willingness to accept feedback and work toward improvement, respect and trust among colleagues, expertise in the knowledge and skills of teaching, supportive leadership from administrators, and a socialization process that imparts the school's vision to newcomers.

Because of the varying definitions of professional learning community, there appears to

be some crossover and differing interpretations related to what constitutes PLC work. For example, PLCs often utilize learning routines established by Critical Friends Groups and action research frameworks. Dufour (2004) presented what is probably the most notable and widely disseminated definition of professional learning communities among practitioners as an "on-going process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve" (p. 8). When considering this definition, it is easy to understand why collaborative teacher inquiry and action research are often regarded as and used interchangeably with the term professional learning community. One problem that has stemmed from the various definitions and practices described in the literature on PLCs is the broad use of the term by many educational organizations. For example, some organizations that claim to be following a professional learning community model support teacher teams that collaborate to deepen their knowledge through a book study or by creating curriculum materials. Both of these examples may be worthwhile teacher learning experiences, but by themselves do not adhere to the rigorous and systematic standards present in more robust forms of collaborative inquiry. Educators working together on these types of learning activities may spend their time collaborating or planning, but discussions are not necessarily inquiry oriented, missing out on the benefits of reflecting on professional practice, student learning data, and interventions.

Critical Friends Groups. A Critical Friends Group (CFG) is a collaborative, democratic and reflective professional learning community that typically consists of 8-12 educators who come together voluntarily to improve teaching and learning (Bambino, 2002). The Critical Friends Group process is highly structured and requires the use of protocols to engage the group in reflective dialogue, goal setting, inquiry, and team building. When the process is tightly

structured, each meeting consists of six steps: (a) facilitator overview, (b) presenter overview, (c) probing or clarifying questions, (d) discussant's group discussion, (e) presenter response, and (f) debriefing. There are three roles within the Critical Friends Group: facilitator, presenter, and discussant (National School Reform Faculty). The facilitator's role is to keep time, remind the group of collaborative norms, participate in the discussion while promoting participation from everyone, and lead the debriefing process. The presenter prepares an instructional issue for discussion, but then acts as an observer who later reports feedback to the group about what was and wasn't helpful. The discussants address the issue and provide positive and critical feedback. CFGs are similar to other forms of inquiry in that they promote collaboration, reflection, shared norms and values, and shared responsibility of student learning outcomes.

Critical Friends Groups generally differ from collaborative teacher inquiry groups and PLCs in two important ways. First, Critical Friends Groups may focus on a new issue or topic every time they meet, whereas collaborative inquiry groups and PLCs tend to focus on one problem or a set of related problems over time as they follow an inquiry cycle of planning, acting, observing, and reflecting to address the problem or problems (Louis & Kruse, 1995). Strong planning begins with problem identification (Ermeling, 2010; Kemmis & McTaggert, 1988). Second, collaborative teacher inquiry teams and PLCs both have a greater emphasis on the use of student achievement data as the groups establish goal outcomes and proceed through each stage of the process (Hord, 2009; Nelson & Slavit, 2008). CFGs do utilize student work and data relevant to the issue being discussed, however student achievement data does not usually drive the CFG process. Instead, the process is largely driven by the group, as any member may bring up a teaching topic of concern or relevant interest for the group to discuss (National School Reform Faculty, 2013).

Lesson study. Similar to collaborative teacher inquiry, lesson study is a collaborative process in which teachers engage in intellectually rigorous study of what they teach and how they teach it (Sparks, 1999). It is a systematic investigation of student learning and teaching where the point of the study is to understand how a lesson fosters intended forms of learning (Cerbin & Kopp, 2006). Teachers jointly plan a classroom lesson, and observe each other teaching the lesson. The teacher team discusses the success of the lesson and often refine and revise the lesson before results are shared with other educators (Campbell, 2003). The components of lesson study include collaboratively selecting a lesson topic and developing goals, designing a lesson, teaching and gathering evidence, reflecting and analyzing evidence, teaching the lesson again, then documenting and sharing the lesson and research (Cerbin & Kopp, 2006).

A key difference that sets lesson study apart from other forms of collaborative inquiry is the initial phase that guides each process. Lesson study begins by defining goals around lesson objectives, whereas the collaborative inquiry process typically begins by identifying and defining a topic, problem, or question for study over a sustained period. Lesson study specifically examines how to improve a particular lesson in order to meet the objectives, while collaborative inquiry works to address a question or problem through actions and reflection over time. At the finale of the lesson study process, participants share their results with others and may select a new lesson for study. While sharing results is encouraged in collaborative inquiry (Clauset & Murphy, 2012; Levine & Marcus, 2010), the inquiry process is also designed to cycle back to the generation of new questions as a result of the team's reflection and learning. A further difference is that peer observation is a component that is often emphasized in the lesson study process (Fernandez et al., 2003). Other forms of inquiry may encourage peer observation, but it is not necessarily emphasized as it is in lesson study. Both lesson study and collaborative teacher

inquiry share an emphasis on collaboration, following a systematic process for planning, acting, reflecting, data analysis, and sharing results. Findings examining the effects of lesson study indicate that in order to benefit from lesson study, teachers first need to learn how to apply critical lenses to their examination of lessons (Fernandez, Cannon, & Chokshi, 2003). These findings support the importance of developing a critical stance when engaged in collaborative inquiry.

Collaborative Inquiry Defined for This Research

Drawing upon multiple forms of collaborative professional learning frameworks and their definitions including action/practitioner research (Cochran-Smith & Lytle, 2009), professional learning communities (Dufour, 2004; Louis & Kruse, 1995), Critical Friends Groups (Curry, 2003; 2008; Little, Gearhart, Curry, & Kafka, 2003), and lesson study (Cerbin & Kopp, 2006; Fernandez, Cannon, & Chokshi, 2003), I summarize collaborative teacher inquiry as a systematic and cyclical learning process of action-oriented and reflective behaviors in which a team of educators investigate their practice in order to learn about an instructional issue and improve practice as they plan for future instruction.

Outcomes Associated with Critical Reflection

Critical reflection has been found to support teacher learning more generally (Berghoff, Blackwell, & Wisehart, 2011; Cruickshank, Kennedy, Williams, Holton, & Fay, 1981; Harvey et al., 2010; Zhao, 2012) and emerging evidence connecting critical reflection and positive learning outcomes during collaborative inquiry is encouraging (Harvey et al., 2010). Collaborative inquiry teams who are able to engage in this highest level of reflection are more likely to build individual capacities, experience a higher level of learning, and make instructional changes that will lead to positive results (Brookfield, 2009; Hagevic, Aydeniz, & Rowell, 2012; Zhao, 2012).

Teams with a willingness to question their instructional practices with a critical lens, are more likely to gain new knowledge and make instructional changes that would have a positive effect on student outcomes (Berghoff et al., 2011; Harvey et al., 2010; Parkison, 2009; Zimmerman, 2009). However, according to Harvey et al. (2010), more research is needed in order to make a conclusive case. Interest in critical reflection is growing and there are a number of studies that have provided promising information about the potential for learning, professional growth, and changes in attitudes and beliefs from engaging in reflection and critical reflection.

Three empirical studies measuring teachers' reflection levels and outcomes shared similar findings and suggested that higher levels of reflection result in improved outcomes. Zhao (2012) analyzed written reflections over the course of four years and found that teachers demonstrating behaviors associated with higher levels of reflection also experienced and reported higher levels of professional and inner growth. Similarly, Schnellert, Butler and Higginson (2008) studied collaborative inquiry teams and found that shifts in teachers' thinking and practice could be associated with teachers' level of engagement in reflective cycles of inquiry. Valli et al. (2006) studied collaborative inquiry and the impact of a culture of inquiry on teacher learning and student achievement and found that teachers attributed positive student gains to their increased reflective capacities. Another study by Lin, Hong, Yang and Lee (2013) observed teacher behavior before and after participating in structured critical reflection activities in which the teachers were specifically reflecting about inquiry-based practices. They found that the teachers were more focused on asking inquiry-oriented questions of their students following the post-treatment and engagement in structured collaborative reflection activities. These initial findings citing the potential benefits of increasing teachers' reflective capacities have invited more research on the impact of reflection on teacher and student learning.

Critical reflection has also been linked with a number of other positive outcomes such as increases in teacher job satisfaction, improved relationships with colleagues and students, and development in teachers' sense of self-efficacy (Fat'hi & Tabataba'i, 2011). Cruickshank, Kennedy, Williams, Holton, and Fay (1981) studied the outcomes of reflective teaching and indicated that teachers who engaged in critically reflective teaching practices were better able to express themselves and articulate the reasoning behind instructional decisions. Two studies examining the effects of critical reflection on teacher identity found that teachers who engaged in critical reflection were more likely to challenge the authoritative advice of experts and the taken-for-granted assumptions of their experiences as students (Berghoff, Blackwell, & Wesehart, 2011; Parkison, 2009). Critical reflection is also advocated in health education fields and one study by Branch (2010) examined the effects of critical reflection on physicians' ability to communicate and incorporate professional values with their patients. Through a combination of experiential and reflective learning, Branch (2010) found that physicians engaging in critical reflection enhanced humanistic values and had transformative effects on their learning.

McAlpine and Weston (2000) examined the work of six teachers to develop a model of metacognitive processes in teacher reflection and concluded that reflection is a mechanism for the construction of knowledge from experience. However, they also determined that knowledge gained did not always lead to behavior change, concluding that practice and feedback over time may move teachers from "better thinking" to "better action." Knowledge gained that leads to transformative learning is more likely to lead to changes in practice. Mezirow's (1991) theory on transformative learning supports the notion that reaching a level of critical reflection is beneficial to helping teachers move from changes in thinking to changes in action.

Within the context of collaborative inquiry, critical reflection has been closely linked

with increased learning and changes to practice (Hagevik, Aydeniz, & Rowell, 2012; Reid, 2004; Sung, Chang, Yu, & Chang, 2009; Sparks-Langer, Simmons, Pasch, Colton, & Starko, 1990; Wesley & Buysse, 2001; Zimmerman, 2009). Collaborative inquiry teams that have demonstrated the capacity to examine their practice with a critical lens have gained new knowledge (Berghoff et al., 2011; Cochran-Smith & Lytle, 1999; Harvey et al., 2010; Nelson et al., 2012; Parkison, 2009; Zimmerman, 2009). The studies examining critical reflection both generally and in the context of collaborative inquiry reported positive outcomes associated with its use. However, few studies have looked at critical reflection and teacher learning outcomes specifically within the context of collaborative inquiry.

Varying Components Identified by Different Scholars

Different scholars have envisioned the collaborative teacher inquiry process in different ways. In this section, I summarize three different perspectives on the desired components of collaborative inquiry as outlined by Nelson et al. (2012), Ermeling (2010), and Kemmis and McTaggert (1998). I selected these authors because the components they envisioned as part of the collaborative inquiry process were all grounded and supported in other research and consistent with my own definition of collaborative inquiry. There are four key similarities across all three perspectives including the notion that collaborative inquiry is a cyclical process, a focus on a problem as teams develop a shared goal or vision (planning), implementation (acting), and utilizing evidence as teams analyze, reflect on, and observe the effects of their actions (analysis). There are three key differences across perspectives, which include whether or not the sequencing of steps matters, how the problem for study is identified, and an emphasis on working until a cause and effect finding can be achieved

Nelson et al. (2012) defined collaborative teacher inquiry as a cyclical process of planning, implementing, collecting, and analyzing data, and inquiry as the collective stance of the group. During the cycle of inquiry, educators develop a shared vision for student learning as an initial step of the planning process and then use multiple forms of student data to identify gaps between this vision and student achievement. Following analysis of this information, teachers identify a specific inquiry focus grounded in an instructional practice and based on the teacher-identified gap between high-quality learning and student learning data results. They then make changes to their individual classroom practices and collect and analyze classroom-based data to investigate the impacts on student achievement. These steps inform subsequent actions for a continuous cycle of learning and improvement.

Collaborative inquiry involves a stance of knowledge negotiation as teachers engage in reflective dialogue about their teaching practices (Nelson, 2008). Employing dialogue grounded in shared experiences and a shared focus, group members question new ideas about teaching, prior instruction, and student work; examine varying perspectives and beliefs; and work toward a co-construction of understanding about the focus of their collaborative work. Nelson et al. (2012) used the term "stance" in relation to the groups' habits of mind. Although they do not specifically use the term reflection in their collaborative inquiry process, reflection is inherent within their descriptions and understanding of inquiry stance as their conceptualization of stance includes a willingness to wonder and ask questions about their practice as a means of seeking understanding. Inquiry stance is described in more depth later in this chapter.

Ermeling (2010) identified the following four essential components that, when followed through with fidelity, are present in instructionally oriented models of inquiry (p. 378):

- identifying and defining important and recursive problems specific to the local context of the participating teachers;
- connecting theory to action by planning and implementing instructional solutions;
- utilizing evidence to drive reflection on the problem and instruction, analysis, and next steps; and
- persistently working toward detectable improvements and specific cause-effect findings about teaching and learning.

Ermeling (2010) suggested that there is no prescribed length of time or number of strategies that will allow an inquiry team to solve a problem, but instead these factors should be determined by whether the team persists long enough to arrive at some important and visible conclusion. Reflection is emphasized as Ermeling (2010) discussed a shift from teachers merely *trying out* a variety of new activities or strategies, but rather *figuring out* how their instructional decisions connect with student learning outcomes through the use of evidence that enables the teacher to better understand the problem and inform decisions about what is working and what actions should be tried next.

Kemmis and McTaggert (1988) identified four fundamental components within action research (planning, acting, observing, and reflecting). Kemmis, McTaggart, and Retallic's (2004) four "moments" of action research outline the following components as essential to the collaborative inquiry process and the systematic investigation of a problem. According to Kemmis, McTaggart, and Retallic (2004), these are not meant to be fixed steps, but rather processes included within a collaborative inquiry design.

1. Planning. This stage includes identifying a problem worthwhile of examination, developing a shared goal or vision, and asking questions that will guide a study towards

understanding the problem and seeking a solution. Guided by evidence, relevant literature, and pedagogical knowledge, a plan for implementation and data collection is created.

2. Acting. During this stage, teachers implement the planned instructional changes.
3. Observing. This stage involves observing the effects of the action in the context in which it occurs. Various forms of data are collected to understand the effects of the action and may include student work, questionnaires, assessments, observations, curriculum artifacts, video records, or interviews.
4. Reflecting. This stage involves making sense of the effects of the action as a basis for further planning and subsequent action through a succession of cycles.

Collaborative teacher inquiry is a systematic process teachers engage in with the goal of improving their teaching practices and student achievement. Kemmis and McTaggert (1988), Nelson et al. (2012), and Ermeling (2010) emphasized similar elements of collaborative inquiry, including reflection and the use of evidence. However, other key processes emphasized by these scholars vary, particularly the stages or steps in an inquiry cycle and how topics for investigation are selected.

Conditions That Support Collaborative Teacher Inquiry

Collaborative teacher inquiry is a multifaceted process, which requires careful attention to certain conditions. There has been general consensus in the literature about the conditions that support learning processes and outcomes when they are present within collaborative teacher inquiry groups (Leithwood et al., 1998; Locke & Jaine, 1995; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Talbert, 2010). Providing teacher teams with a framework and time to engage in collaborative teacher inquiry does not mean that they will have the tools, training, knowledge, and skills to cycle through the inquiry process in a productive way (Supovitz & Christman, 2005).

Some conditions that have been found to support productive teacher inquiry include frequent and stable meeting times (Cosner, 2012; Stoll, Bolam, McMahon, Wallace, & Thomas, 2006; Young, 2006), job-alike teams (Ermeling, 2010; Gallimore et al., 2009; Nelson, 2008), building leadership that supports and holds teacher teams accountable (Borko, Wolf, Simne, & Uchiyama, 2003; Clauset & Murphy, 2012; Gallimore et al., 2009; Saunders, Goldenberg, & Gallimore, 2009), a skilled and trusted facilitator to guide the process (Cosner, 2012; Dana & Yendol-Hoppey, 2008; Foster & Noyce, 2004; Gallimore et al., 2009; Kazemi & Franke, 2003; McLaughlin & Talbert, 2006; Richmond & Manokore, 2010; Timperley & Parr, 2007; Young, 2006), and the use of inquiry protocols that advance focused dialogue and reflection (Cosner, 2012; Gallimore et al., 2009; Levine & Marcus, 2009; Nelson, 2008; Little et al., 2003; Snow-Gerono, 2005). These conditions are important in supporting teacher teams, and when absent can undermine the process of collaborative inquiry. Conditions supporting collaborative inquiry are well documented, but less well understood is how the enactment of key components within the collaborative inquiry process influences critical reflection. In the following section, I describe components I have identified as essential to the process and discuss what is known and unknown about each component.

Collaborative Inquiry Enactment

When designing and enacting collaborative inquiry experiences, the literature points to the importance of careful consideration of certain components emphasized during collaborative inquiry and how structured reflection opportunities are built into components of the process. The work of various scholars has revealed a range of somewhat different components that can be drawn upon as teachers engage in collaborative teacher inquiry (Nelson et al., 2012; Ermeling, 2010; Kemmis & McTaggert, 1998). Yet, little is known about how the enactment of these

components may influence critical reflection during the collaborative inquiry experience.

In this study, I drew from a wide range of literature on collaborative inquiry, including the literature on key components discussed in the previous section to turn my attention toward the enactment of five focal components within collaborative inquiry: (a) problem identification, (b) developing a shared vision, (c) planning for action, (d) analysis, and (e) making practice public. Ermeling (2010), Nelson et al. (2012), and Kemmis and McTaggert (1998) have all emphasized the first four components as essential to the collaborative inquiry process. Additionally, these four components are commonly cited as present in robust forms of collaborative inquiry (Butler & Schneller, 2012; Levin & Rock, 2003). The fifth component, making practice public, is central to the conceptualization of collaborative inquiry work described by Kruse, Louis, and Bryk (1995) and emphasized by others as beneficial to team learning (Clauset & Murphy, 2012; Horn & Little, 2010; Levin & Marcus, 2010; Little, 2002). The focal components of problem identification, developing a shared vision, planning for action, and analysis are all specific steps that teams are likely to engage in during collaborative inquiry. Making practice public differs from the other focal components as it could happen in multiple places throughout the collaborative inquiry cycle. Louis et al. (1995) emphasized the "deprivatization of practice" when examining problems of practice, planning, and analysis. Little (2002) suggested that the transparency with which teachers share their practice affects what we can expect them to learn from their collaborative work. The component of implementation is not included as a focal component in this study, as it is implied through planning for action and can be studied and considered through the components of planning for action and analysis.

Problem identification. Many scholars have pointed to the identification of a problem as the first step in collaborative inquiry and certain factors have been found to influence teacher

learning for improvements in instruction when defining a problem (Ermeling, 2010; Kemmis & McTaggert, 1998; Sagor, 2010). A collaborative teacher inquiry team is more likely to improve instruction if teachers examine their instructional practice with a focus on measurable student learning outcomes (Clauset & Murphy, 2012; Copland, 2003; Levine & Marcus, 2010; Talbert, 2010). Timperley (2009) found that teams that focused attention on student achievement when identifying a problem were more effective. Many inquiry designs suggest identifying and studying a problem connected with student achievement (Copland, 2003), while schools that accept the practice of a broader and unsystematic collaborative inquiry framework may focus more on the notion of a shared vision, wondering, innovation, solution, or project completion (Cunningham, 2011; Dana & Yendol-Hoppey, 2008; Simm & Ingram, 2008). Inquiry models that don't begin the planning process by focusing on an instructional problem may have less of an impact on teacher learning and student achievement. Saunders, Goldenberg, and Gallimore (2009) suggested that groups focused on increasing teacher knowledge but not its direct application to student learning difficulties might have a weak effect on achievement. To elaborate this point, they provided an example of the contrast between a collaborative inquiry team that learns to use digital cameras for general application to classroom teaching compared with a team focused on its school's persistently low performance on items measuring fraction concepts or reading comprehension. They noted that both collaborative inquiry studies can be beneficial for students, but they argued that a specific student academic need that can be monitored through the use of data might be a more productive and sustaining team focus than an opportunity to learn something of more general value.

Many forms of collaborative inquiry include the use of student learning data when identifying a problem (Cerbin & Kopp, 2006; Cochran-Smith & Lytle, 2009; Cosner 2011a,

2011b, 2012, 2014; Dufour, 2004; Fernandez, Canoon, & Chokshi, 2003). However, teachers often lack the necessary skills and support to use data-based inquiry in a way that informs and influences classroom practice (Cosner, 2011; Nelson et al., 2012). Effective use of data is a critical component to collaborative teacher inquiry (Cosner, 2012; Dana & Yendol-Hoppey, 2008; Young, 2006) but when teachers use data without the consideration of past practices, it can impede teacher learning for instructional change (Cosner, 2011). Looking at student work and being able to make accurate interpretations of student learning for instructional planning is a skill that takes time and practice (Little et al., 2003; Timperley & Earl, 2009). Cosner (2011) found in a three-year qualitative multi-case study that teachers had difficulty linking student learning data with past instruction. Her findings indicated that "instructional planning appeared to evoke considerations of what to teach and to whom without necessarily arousing investigations into the efficacy of past instruction" (Cosner, 2011, p. 583-584). Teacher knowledge and skills with data use have been found to be a factor influencing problem identification and subsequent planning for action during collaborative inquiry. Studies that have looked at problem identification have found that data interpretation skills are an influencing factor related to effective planning. Studies have also looked at problem identification and the effects on teacher learning and student achievement outcomes, but less well understood is how enactment of problem identification influences critical reflection within collaborative inquiry. Consideration of student achievement has been advocated in the research, but less is known about whether or how framing a problem around a student learning issue versus an instructional problem impacts critical reflection.

Developing a shared vision. Following the identification of a problem, collaborative inquiry teams are likely to develop a shared goal or vision related to one or all of the following: student learning, teacher learning, or teacher practice. (Kemmis & McTaggert, 1998). Kemmis

and McTaggert (1998) argued that during this component, teachers should ask questions that will guide their study towards understanding the problem and seeking a solution. Nelson et al. (2012) advocated developing a shared vision for student learning by using various forms of student data to identify gaps between this vision and what is actually happening. Others have pointed to the importance of mutual accountability within a collaborative inquiry team and have suggested that a shared vision focused on student achievement results is essential towards establishing a culture of inquiry (Nelson et al., 2012; DuFour, 2004). When collaborative inquiry teams develop a shared vision, a shift in thinking about "my students" to "our students" occurs, and teachers become more aware of the incongruities that exist between the commitment to ensuring that all students learn and how to respond when some students do not learn (DuFour, 2004). Talbert (2010) suggested that when teachers jointly assess the performance of their students, they are more likely to effectively craft interventions to meet the students' learning needs. Scholars have suggested that a team's vision should be connected to an achievement problem and focused on student achievement results. Research has looked at how the development of a shared vision has influenced teacher accountability and student achievement, but little is known about how the enactment of this component influences whether or how teachers critically reflect about prior instructional practices.

Planning for action. Once a shared vision has been established, collaborative inquiry teams develop a plan for the implementation of actions to address the problem and explore solutions (Ermeling, 2010). As teachers plan for action, the degree to which teachers possess pedagogical and content knowledge and skills in interpreting student learning data has been found to influence the efficacy of their planning including problem identification and analysis for future planning. Individual and collective pedagogical content knowledge is a critical factor for

collaborative inquiry teams to exhibit as they plan for action (Borko, 2004; Cosner, 2012; Timperley & Parr, 2007). Timperley and Parr (2007) contend that without the development of teachers' pedagogical content knowledge on which to draw when challenges are presented, inquiry into the effectiveness of practice resulting in positive practice changes is unlikely to occur.

The use of inquiry protocols has been found to support functions within a group during planning such as agenda setting, analyzing student work, and reflection on prior instructional practices (Galimore et al., 2009). Inquiry protocols can provide teams with structure and guidance that support reflective dialogue and assist in documenting student work, teacher learning, and the inquiry process (Cunningham, 2011; Dana & Yendoll-Hoppey, 2008; Gallimore et al., 2009; Little et al., 2003; Sagor, 2010; Young, 2006). While protocols are commonly used during collaborative inquiry, the literature on inquiry protocols is mixed and underdeveloped (Cobb, McClain, Lamberg, & Dean, 2003; Given, Kuh, LeeKeenen, Mardell, Redditt, & Twombly, 2010; Little et al., 2003). Inquiry protocols are discussed more in a later section. My study seeks to add to the current research and examine how the enactment of planning for action, including tools such as inquiry protocols utilized by teacher teams, may promote critical reflection.

Analysis. After teachers have begun implementing actions as part of their collaborative inquiry plan, analysis of the effects of their actions on student learning is essential for future planning. Analysis that leads to teacher learning and instructional changes has been found to be supported through factors including effective use of student learning data and the adherence of an inquiry stance. Many scholars have advocated collecting various forms of data and utilizing evidence as an important part of this component of the process (Cosner, 2011; Ermeling, 2010;

Kemmis & McTaggert, 1994; Nelson et al., 2012). According to Nelson et al. (2012), teams skilled in collecting and making sense of data are more likely to make decisions that will improve future instruction. Student work, student interviews, student questionnaires, checklists, self-assessments, portfolios, systematic classroom observations, test results, and audio or video recording from the classroom are all potential sources of data that can be utilized during analysis. According to Parr and Timperley (2008), knowledge of learners and instruction involves being able to identify patterns of strengths and weaknesses, looking back on past instruction in order to assess the effectiveness of instruction, and using that information to look forward in deciding what and how to teach next. Developing the skills needed to collect and analyze data effectively is not automatic, but can be supported through practice in gathering and interpreting data, high levels of content knowledge in the area the data is referencing (Cosner, 2011; Parr & Timperley, 2008), and guidance by expert facilitators and tools designed to support consideration of the efficacy of instructional practices (Kazemi & Frank, 2003).

The importance of an inquiry stance for improved teacher learning is well documented (Cochran-Smith & Lytle; 2009; Earl, 2009; Earl & Timperley, 2009, Nelson et al., 2012). The inquiry stance of the group is important while identifying a problem and during analysis. I have chosen to discuss inquiry stance during the section on analysis because analysis often circles back toward the identification of new problems. Nelson et al. (2012) investigated teachers' actions and interactions within inquiry groups, revealing that a major factor that either constrained or afforded the potential of a group to critically analyze student learning data and make links between learning and instructional practices was the inquiry stance of the group. An inquiry stance means actively searching for understanding and being able to shift personal and group orientation from certainty and arguing a position to curiosity and exploring other positions

(Larivee & Cooper, 2006). Cochran-Smith and Lytle (1999) described stance as "the positions teachers and others who work together in inquiry communities take toward knowledge, its relationships to practice, and the purposes of schooling" (p. 288). Wells (1999) defined an inquiry stance as "a willingness to wonder, to ask questions, and to seek to understand by collaborating with others in the attempt to make answers to them" (p. 121).

Nelson et al. (2012) described two dimensions of stance: (a) an epistemological stance toward student learning data, which they delineate into four categories ranging from an improving stance to a proving stance, and (b) the nature of a team's dialogue when using data in its inquiry process, which ranges from sustaining negotiation to no negotiation. Charalambous and Silver (2008) also differentiated teachers as having either a proving or improving stance when they approached assessment data. Nelson et al. (2012) hypothesized that an improving stance is essential to transformative professional learning through collaborative inquiry. Teacher groups adopting an improving stance were open to questioning and changing their practice, while groups with a proving stance toward student data attempted to prove strengths in their practice by using data to support student achievement gains. For example, teachers with a proving stance were more likely to use student data that showed numeric scores or aggregated rankings to prove the effectiveness of their practice, rather than reflecting on potential changes and improvements to their practice. Further, groups exhibiting a proving stance were also less likely to question their practices, limiting opportunities for instructional change. On the contrary, teachers with an improving stance saw assessment as a tool for better understanding students and student thinking, and then made changes to their practice. Nelson et al. (2012) found that groups with an improving stance carefully examined student data and sought to identify limitations within their classroom practice. This helped teachers to engage in collaborative discussions on how to

improve their practice. Nelson et al. (2012) believed that changing one's practice is an integral part of an improving stance, which involves seeking out questions rather than answers. Both the effective use of interpreting student learning data and the adherence of an inquiry stance have been found to support teacher learning and instructional changes during collaborative inquiry. Building on this knowledge, this study examines tools, strategies and enactment methods used during analysis that may promote critical reflection.

Making practice public. Making teachers' past instructional practices public for others' consideration can happen during multiple stages of collaborative inquiry. It is most prevalent and necessary during the analysis stage when teachers must make their actions known to others so that the group can see how variable actions may contribute to student results. Publicizing inquiry work both within the group and externally has been found to increase the efficacy of an inquiry team. Through their studies of teacher learning groups, Clauset and Murphy (2012) and Levine and Marcus (2010) both identified publicizing teams' work as beneficial to teacher learning. By sharing work within a group, team members gain the benefit of reflecting on the multiple perspectives of the group. Making practice public encourages collaborative reflection and the development of a critical perspective on one's own behavior (Osterman & Kottkamp, 1993). The deprivatization of practice is also emphasized by Horn and Little (2010) and Kruse, Louis, and Bryk (1995), who noted the importance of confronting well-established norms of privacy to make tacit knowledge explicit. Fullan (2001) suggested that through group interactions and sharing of practices, tacit knowledge is converted to shared knowledge and understanding.

Making collaborative teacher inquiry public to those outside the group serves two purposes. First, when teams know that they will be sharing their work externally, it provides a level of pressure that holds the group accountable for its work. Second, sharing what the team

has learned from its experience may advance the learning of others outside of the collaborative teacher inquiry team (Priestley, Miller, Barrett, & Wallace, 2011). As Valli, van Zee, Rennert-Ariev, Mikeska, Catlett-Muhammad, and Roy (2006) suggested, "By making their findings public, teachers have the potential to influence the thinking and practices of colleagues and other educators" (p. 96). A study by Givin, Kuh, LeeKeenan, Mardell, Redditt, and Twombly (2010) determined that teacher groups experienced a powerful shift when they decided to share their documentation and collective learning in public, citing that "the act of going public catalyzed each group to work through the challenges and tensions exposed by the process" (p. 40).

In sum, the five focal components identified for this study have been supported in the literature as being important components of the collaborative inquiry process. Certain factors have been found to influence teacher learning, instructional practices, and student achievement within these five components. The effective use of student learning data was a commonly cited factor of influence across multiple focal components. Less well understood is how the enactment of each component, including tools utilized by teams, promotes or limits critical reflection. Building in structured opportunities for critical reflection within the collaborative inquiry process has been advocated in the literature and requires consideration by those responsible for designing and facilitating collaborative inquiry (Ash & Clayton, 2009; Lucas, 2012; Orland-Barak & Yinon, 2007).

Designing Opportunities for Reflection and Critical Reflection

Research indicates that empowering teachers as reflective professionals requires those responsible for designing teacher learning activities to structure experiences that develop critically reflective skills (Parkison, 2009). Designing an effective climate for learning through reflection and critical reflection requires a clear understanding of the purpose, meaning, and

expectations for reflection (Harvey et al., 2010; McNamara & Field, 2007) as well as careful consideration of the desired outcomes (Ash & Clayton, 2009). Orland-Barak and Yinon (2007) support inquiry designs that build in structured reflection activities, reporting that teachers who engaged in guided reflection activities gained new and multifaceted understandings about the connection between theory and practice. Critical reflection is not a process that occurs automatically and needs to be carefully and purposely designed with structured strategies that encourage engagement in reflection (Ash & Clayton, 2009; Lucas, 2012).

The literature on reflection provides leaders of collaborative inquiry with some guidance for integrating reflection into the collaborative teacher inquiry process. Harvey et al. suggested designers of inquiry establish the role reflection may play when considering the following six factors in the early stages of planning reflective learning experiences: (a) how reflection will be situated within the learning experience; (b) how reflection will be defined for learners; (c) how reflective skills will be modeled and taught; (d) how reflection in and on action will be promoted in order to help learners then make sense of their experiences; (e) how and when colleagues will access their peers for a collaborative learning experience; and (f) how the reflective experience will be assessed for alignment with the intended learning outcomes. Ash and Clayton (2009) contended that critical reflection that generates, deepens, and documents learning does not happen naturally, and must be carefully and intentionally designed. They suggested the following three steps for consideration by those designing critical reflection experiences (Ash & Clayton, 2009, p. 28):

1. determining the desired outcomes, learning goals, and associated objectives;
2. designing reflection so as to achieve those outcomes; and
3. integrating formative and summative assessment into the reflection process.

It is important to consider both reflection strategies and mechanisms (Ash & Clayton, 2009). Strategies include the consideration of when, where, and how often reflection will occur, who will facilitate it, and how feedback will be provided. Reflection mechanisms to consider include what learning goals will be addressed, what medium and prompts will be used, what products will demonstrate the learning, and what criteria will be used to assess learning (Ash & Clayton, 2009). Although teachers have the motivation and skills to improve instruction, it is often the case that integrate layers of support are necessary to achieve this goal. Some supports may stem from within the teacher community, but others must come from those who can facilitate and promote these teacher-led processes.

Based on the review of literature, much is known about the supportive conditions for teacher learning and the components found in more robust forms of collaborative inquiry. Moreover, when structured reflective experiences are built into the collaborative inquiry process, improvements in instructional practices are more likely (Reid, 2004). Reflection during collaborative teacher inquiry warrants further examination, and this study addresses the gap in literature concerning how enactment of the focal components known to be important to the collaborative inquiry process influences reflection. In the next section, I will reveal what is known about how collaborative teacher inquiry and reflection are supported or enabled, including aspects that have yet to be examined in relation to conversational routines during collaborative teacher inquiry.

Conversational Routines

Conversational routines have been found to play a role in collaborative teacher learning experiences. Horn and Little (2010) defined conversational routines as patterned and recurrent ways that conversations unfold within a social group. Routines are composed of turns of talk that

influence the conversation to either set up or constrain the response of subsequent speakers. These authors found that characteristic conversational routines provided different learning resources for teams to access, conceptualize, and learn from problems of practice, which in turn led the groups to make different headway towards their shared goals. Horn and Little (2010) paid attention to how speaker contributions shaped the framing of the problem and suggested that certain exchanges seemed to extend or close off the group's analysis. Conversational characteristics related to a problem of practice that Horn and Little (2010) highlighted as impacting learning included normalizing, specifying, revising, and generalizing to principles of teaching. Horn and Little (2010) defined normalizing as conversations that defined a problem as normal, or an expected part of classroom work and teacher experience, e.g. "We've all been there." They described specifying and revising as questions that explicitly elicit more details, invite analysis, and activate a crucial transition to focused reflection on the problem, e.g. "Can you identify the source of the problem?" Lastly, Horn and Little (2010) described generalizing as conversations that link accounts of practice with general principles of teaching. They noted that conversations that turned teachers toward teaching, instead of away (i.e. toward external problems or students) were more likely to open discussions that promoted learning. Additionally, their findings supported the need for more systematic supports designed to address these conversational routines within professional learning communities.

Three additional studies examining teacher talk within teacher teams have found that critically reflective dialogue is rare. The first study discussed in this section is outside the scope of collaborative inquiry, but studies by Ohlsson (2013) and Nelson (2008) are specific to collaborative inquiry. Emery (1996) examined critical reflection through teacher talk about portfolio assessment based on Smyth (1989). His model of stages or aspects of reflection

differentiated among four stages of reflection: describing, informing, confronting and reconstructing (Smyth 1989). Describing limits dialogue to discussion of events and what happened. Informing discussions begin to search for meaning by considering the pedagogical principals behind what happened. Confronting conversations explore the assumptions, values, and beliefs about teaching that influenced what happened. Reconstructing involves teacher questions considering how practices might change. Emery (1996) analyzed transcripts of teacher talk considering these four stages. He found that teachers' conversations were primarily made up of describing and informing stages. Confronting and reconstructing were far less well developed in the conversations. Similarly, Ohlsson (2013) explored the reflection processes of three teacher teams from different schools. Through observations and interviews, he found that teams often avoided critical comments during team discussions. Ohlsson (2013) advocated the use of collective reflection loops, which he describes as the turn from talk about student problems to joint task construction. His findings suggested that when teams engaged in collective reflection loops they were more likely to transform the contents of their conversations to be more reflective and focused on their own actions (Ohlsson 2013). Similarly, Horn and Little (2010) found that conversations that turn toward teaching instead of away are more likely to result in teacher learning. Nelson (2008) studied the underlying questions that emerged from inquiry teams to determine the inquiry stance of each team, revealing that teachers demonstrated difficulty in asking critical questions about their practices. My study has built on the work of Ohlsson (2013) and Nelson (2008) by determining the specific routines that contribute to or limit teachers' abilities to reflect about their prior instructional practices.

Earl and Katz (2010) found that educators often feel uncomfortable promoting the transparency of their practice and making tacit knowledge visible and open to scrutiny.

Considering this, it is no surprise that Timperley and Earl (2009) found that one of the prevailing concerns among teachers discussing student data and teacher practices during inquiry was to reduce threat and ensure comfort rather than to increase teacher learning. They noted that even though participants were willing, conversations often appeared productive on the surface but did not actually stimulate new learning or action. In most of the conversations observed in their study, the participants very rarely moved beyond congenial conversations to challenging interpretations and actions, particularly in the interests of students (Timperley & Earl, 2009). Earlier research has pointed to certain conversational routines (specifying, revising, normalizing, and generalizing) that influence teacher learning during collaborative inquiry. Moreover, others examining teacher talk during collaborative inquiry have found that critically reflective dialogue is difficult and rare for teachers, but turning conversations toward teaching and joint task construction can promote discussion and reflection on one's own actions. Less well understood are the specific conversational routines that may assist in turning a conversation towards teaching practices and promote collegial and reflective dialogue. My study seeks to address this knowledge gap and contribute to the literature examining teacher talk and reflection.

The next four subsections of conversational routines discuss what is known and unknown about the following factors as related to reflection and critical reflection: trust and collegiality, the role of the facilitator, discussion techniques for promoting reflective dialogue, and inquiry protocols used during collaborative inquiry. First, trust has been established as a factor known to influence collegiality among teacher teams. In the next section, I discuss the importance of trust as it has also been found to promote reflective dialogue during collaborative inquiry. Second, literature has suggested that the role of the facilitator influences group productiveness (Cosner, 2012; Dana & Yendol-Hoppey, 2008; Gallimore et al., 2009; Little et al., 2003; Poekert, 2010).

As such, the role of the facilitator and how he or she may also influence reflection are reviewed. Third, I present discussion techniques used by teachers and facilitators during collaborative inquiry that were consequential to my understanding of the conversational routines that influence reflection. Fourth, I discuss the use of inquiry protocols that have been supported in the research as a practice that can support reflective dialogue (Cunningham, 2011; Dana & Yendoll-Hoppey, 2008; Gallimore et al., 2009; Little et al., 2003; Sagor, 2010; Young, 2006).

Trust and collegiality. Teams that trust each other and where collegiality is the norm are more likely to engage in a variety of necessary and influential learning behaviors involved in collaborative teacher inquiry (Little, 1982; Timperley, Annan, & Robinson, 2009). Trust is an antecedent to collegiality as it promotes feedback seeking, vocalizing concerns, and risk taking (Cosner, 2012). Trust can be fostered in a culture where it is safe to be honest (Lucas, 2012) and is more likely when teams work in similar roles (Saunders et al., 2009). Little (1982) found that on successful teams, teachers valued and practiced norms of collegiality, continuous improvement, and experimentation while pursuing a wider range of professional interactions with their colleagues that included talk about instruction, structured observations, and shared planning and preparation. Richmond and Manokore (2010) found that teachers identify and value collegiality as critical for their own professional growth. Nelson et al. (2012) and Kennedy (2010) shared this view and argued that the potential for impacting student learning through collaborative work is expanded or limited by the nature of teachers' conversations. According to Nelson et al. (2012), it is critical that collaborative teacher inquiry groups shift from engaging in discussions that are focused on sharing activities and information to raising and pursuing questions about learning goals and instructional practices. They describe this transformational

shift from sharing to inquiry as essential if collaborative teacher inquiry groups are to have an impact on improving teacher and student learning outcomes (Nelson et al., 2012).

Dana and Yendol-Hoppey (2008) discussed the importance of collegial conversations in healthy inquiry groups. They asserted that the dialogue that occurs in a purely congenial relationship excludes the kind of teacher talk that promotes wondering, thought, growth, and action. Timperley and Earl (2009) suggested that "it is this element of challenge that moves conversations beyond superficial talk to exploring deeper meanings for the purpose of improvement" (p. 124). Key elements suggested by Nelson, Dueul, Slavit, and Kennedy (2010) that break the habit of congenial conversations include all group members: (a) asking and answering probing questions about the reasons for, impact of, and evidence that supports their decisions; (b) recognizing the value of cognitive conflict as a way to gain a deeper understanding; (c) being intentional about and accountable for the nature of dialogue; and (d) accessing and using tools that support a shift from congenial to collegial conversations.

Role of the facilitator during collaborative inquiry. The role of the facilitator, whether shared among the group or assigned to one individual, may influence the routines and practices of the team. As I observed teacher teams engaged in collaborative inquiry, understanding what is known about the role of the facilitator and the potential influence facilitation has on teacher's conversations, trust, and behaviors were significant. There has been general consensus that facilitators play an important role in collaborative inquiry, and that a skilled and trusted facilitator may advance inquiry-oriented conversations, keep meetings focused on student learning, and guide the effective use of protocols (Cosner, 2012; Dana & Yendol-Hoppey, 2008; Gallimore et al., 2009; Little et al., 2003; Poekert, 2010). However, different scholars have offered varied interpretations of what the role of the facilitator should be in collaborative inquiry

groups. York-Barr, Sommers, Ghere, and Montie (2006) suggested the main responsibilities of the facilitator in small reflective collaborative groups are to: clarify the purpose, task and process; guide the process to assure participation; monitor and adjust the process as needed; remain neutral about the topic and outcome; and solicit a summary and clarification about follow up. Clawson and Bostrom (1995) studied the critical dimensions of a facilitator and ranked the top five behaviors as: plans and designs meetings; listens, clarifies, integrates; demonstrates flexibility; keeps outcome focused; creates open environment.

There are benefits to teachers sharing facilitation responsibilities within their group. Gallimore et al. (2009) suggested that the role can be shared and that teams are more effective with peers leading rather than an administrator. Designating teacher facilitators also reinforces a distributive leadership model, which has been cited as supporting an environment of trust (Copland, 2003; Smylie, Mayrowetz, Murphy, & Louis, 2007; Spillane, Halverson, & Diamond, 2004). Research has pointed to the significance and certain functions of a facilitator's role in collaborative inquiry, but little has been documented differentiating successful facilitators from unsuccessful ones or describing the experiences of inquiry facilitators and their specific training needs (Krell & Dana, 2012). Current research on the facilitation of inquiry has primarily focused on dilemmas such as lack of time and resources, or issues of power in shared teacher leadership (Poekert, 2009). Promoting reflective dialogue that includes constructive and useful feedback is an important skill (Timperley & Parr, 2007) and many scholars have highlighted the need for more research in this area (Clawson & Bostrom, 1995; Cosner, 2012; Dana & Yendol-Hoppey, 2008; Gallimore et al., 2009; Little et al., 2003; Poekert, 2010)

Discussion techniques for promoting reflective dialogue. It is well documented that certain activities promote reflective processes, but less well understood is how facilitators can

influence and shape reflective dialogue during collaborative inquiry through the use of specific techniques. A goal for facilitators during collaborative inquiry is to promote critical reflection and assist the group in identifying biases, understanding their roots, and preventing biases from interfering with teachers' capacity to understand the problem (Chin, 2004). We know that certain teacher learning activities such as peer observation or narrative storytelling can promote critical reflection, but we are still learning how to facilitate conversations around these activities for promoting critical reflection.

Research examining the ways in which facilitators promote reflective dialogue and the specific interactions and conversations taking place during collaborative inquiry has been sparse (Little, 2012; Wilson & Berne, 1999; Young & Kim, 2010). Vreede and Briggs (2005) concluded that group characteristics (size, composition, and cohesiveness) are less important than specific task characteristics (specific activities to accomplish a task), suggesting that collaboration processes and effective facilitation techniques can be used to promote collaborative learning with different types of groups. As such, I drew upon literature that examined facilitation among a wide range of collaborative groups since empirical studies investigating the facilitator's role specifically during collaborative inquiry have been almost non-existent. A study by Kolfschoten, Hengst-Bruggeling, and Vreede (2007) explored the strategies and techniques facilitators use during the collaboration process and defined facilitation as an approach to collaboration support in which a variety of tools, methods and interventions are used to support teams in achieving their goals. They noted that studies investigating collaborative groups have suggested that facilitation, specifically the design and planning for the execution of group tasks and processes, is the facilitator's most important task (Clawson & Bostrom, 1995; Vreede, Boonstra, & Niederman, 2002; Vreede, Davison, & Briggs, 2003).

A variety of facilitation techniques are described in the literature, though little is known about the efficacy of these techniques and empirical research on effective facilitation in traditional group or collaborative inquiry settings has been minimal. Nelson, et al. (2010) suggested that a key element in breaking the habit of congenial conversations and promoting critically reflective conversations is ensuring that all group members ask and answer probing questions regarding the reasons, impacts, and evidence that support their instructional decisions. The types of questions asked during collaborative inquiry may be linked with different types of reflection, but little is known about how these techniques cultivate critical reflection. Dana and Yendol-Hoppey (2008) believed that effective collaborative inquiry facilitators were able to listen carefully and patiently as teachers gave voice to a dilemma, problem, issue, or tension in their practice. In *The Reflective Educator's Guide to Professional Development*, Dana and Yendol-Hoppey (2008) provided definitions and examples of seven types of actions or techniques that facilitators can use with collaborative inquiry groups (p. 85). Some of these techniques share similarities with the conversational routines identified by Horn and Little (2010). For example, the technique of asking clarifying questions is similar to the conversational routine of specifying, while "probing questions" is similar to the conversational routine of revising. The definitions and examples have been modified slightly for this research (see Table 1).

Inquiry protocols used during collaborative inquiry. Inquiry protocols have been found to support focused and reflective dialogue (Cunningham, 2011; Dana & Yendoll-Hoppey, 2008; Gallimore et al., 2009; Little et al., 2003; Sagor, 2010; Young, 2006). When following an inquiry protocol, the facilitator is instrumental in helping teachers move away from seeing inquiry as completing a project toward taking an inquiry stance and asking probing questions

(Dana, Yendol-Silva, & Snow-Gerono, 2002; Nelson & Slavit, 2007; Poekert, 2010). However, facilitators must have the skills to effectively use inquiry protocols to promote reflective dialogue (Poekert, 2010; Wood, 2007). Research and perspectives on the use of inquiry-based protocols have been mixed. Little and Curry (2008) found that team discussions guided by specifically designed protocols both promoted and limited teachers' opportunities to learn by hindering the spontaneous learning and unexpected positive outcomes that Hargreaves (1994) suggested are present in collaborative cultures (Datnow, 2011). Timperley and Earl (2009) also noted concerns about inquiry protocols and warned, "While these kinds of protocols may assist groups of teachers to begin to have evidence-informed conversations, the problem with such protocols…was that following protocols could become more important than what is learned" (p. 125). Galeo (2012) echoed this sentiment and argued against attempts to systemize reflective thought processes as it supports a behavioristic approach to learning and may manifest into teachers following a 'how to' manual where specific modes of reflection contribute to the homogenization of reflective practice. With this in mind, it appears that inquiry protocols have the potential to serve as effective tools in structuring and promoting reflective processes that deepen learning; however, less well understood is how to achieve these desired benefits without taking away from and routinizing the process.

To synthesize this review of literature, collaborative inquiry models and components within the process have varied, but the literature tells us that certain conditions and components should be considered when implementing collaborative teacher inquiry. Less well understood is how enactment of the key components within an inquiry cycle influences teacher reflection. Studies looking at reflection have found critical reflection to be extremely rare. We know that certain conversational routines have been found to influence teacher learning, but little is known

about how these conversational routines may influence reflective dialogue among teacher teams. Emerging research on reflection and teacher learning outcomes is promising, but more empirical evidence is needed in order to substantiate its value in teacher learning experiences. My research proposes to contribute to the existing knowledge base and address these gaps in the literature.

Chapter Three: Conceptual Framework

This study was guided by the extensive body of research on how teachers learn. Consistent with constructivist and situated perspectives, this research is based on the premise that teacher learning is promoted when professional activities are collaborative, inquiry-oriented, and situated in the context in which they occur. Collaborative teacher inquiry is a systematic process that emphasizes hands on experience. However, despite the popular saying "experience is the best teacher," experience without reflection can be problematic (Ash & Clayton, 2009; Harvey, Coulson, Mackaway, & Winchester-Seeto, 2010). According to Ash and Clayton (2009), experiential learning alone can often lead to the reinforcement of stereotypes, the development of simple solutions to complex problems, and general inaccuracies based on limited data. As Biesta and Burbules (2003) pointed out, the move from trial and error action to intelligent action is affected by the practice of reflection. Based on the research presented in the literature review, I view critical reflection as essential to teacher learning within collaborative inquiry. This view is influenced and informed by Mezirow's Transformative Learning Theory.

My conceptual framework ties in earlier discussions of key components of collaborative inquiry seeking to promote transformative learning through reflection and the reframing of our meaning schemas and instructional practices. This section includes a summary and visual of my conceptual framework (see Figure 1) that takes into consideration my understanding of collaborative inquiry, reflection, and potential learning outcomes. I then review the components that I believe are essential to the collaborative teacher inquiry process. Next, I summarize the literature that I used to better understand the levels of reflection and which helped me distinguish between the four levels of reflection. Finally, I introduce transformative learning theory and the potential teacher learning and instructional outcomes that I paid attention to in this study.

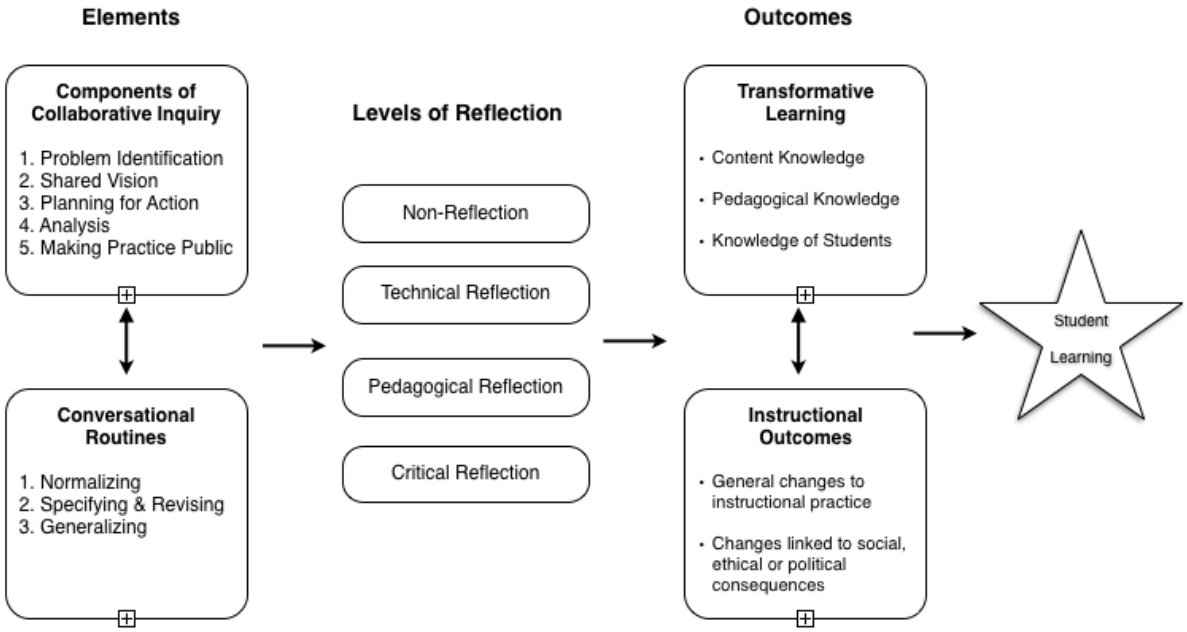

Figure 1. Conceptual framework. This figure depicts how instructionally oriented and robust forms of collaborative inquiry and critical reflection can lead to transformational learning and instructional changes in teacher practices.

Conceptual Framework Model

My conceptual framework (see Figure 1) includes the five components of collaborative inquiry and features of conversational routines that received attention in this study. My study focused on how the enactment of these five components and teachers' conversational routines influence reflection levels, teacher learning, and instructional outcomes associated with critical reflection.

Focal Components of Collaborative Inquiry

Collaborative teacher inquiry is a process that seeks to engage teachers in a cycle of reflective and action oriented behaviors in order to learn more about and address a topic, question, or problem related to their own instructional practice (Butler & Schnellert, 2012). As educational leaders take actions to support collaborative inquiry, they often engage teams with

particular collaborative inquiry components that shape the inquiry process (Ermeling, 2010). From my review of the literature, I have identified five focal components of an inquiry process that have been found to support collaborative inquiry; my first research question explores whether and how enactment of each of these components impacts critical reflection on prior instructional practices.

Problem identification. Teams identify an important problem worthwhile of examination and specific to the local context of the participating teachers (Ermeling, 2010; Saunders, Goldenberg, & Gallimore, 2009).

Developing a shared vision. Teams define a student learning goal or outcome (Kemmis, McTaggart, & Retallic, 2004; Nelson et al., 2012).

Planning for action. Guided by evidence, a plan for implementation of teacher strategies addressing the shared vision or goal is developed (Ermeling, 2010; Kemmis, McTaggart, & Retallic, 2004).

Analysis. Teachers observe and make sense of the effects of the action as a basis for further planning and subsequent actions (Ermeling, 2010; Kemmis, McTaggart, & Retallic, 2004; Nelson et al., 2012).

Making practice public. Teachers share, observe, and discuss each other's teaching methods and philosophies. This involves making the actions of teaching visible or understood by others (Clauset & Murphy, 2012; Levine & Marcus, 2010; Louis, Kruse, & Bryk, 1995).

Conversational Routines

Horn and Little (2010) found that the following conversational routines impact teacher learning: normalizing, specifying, revising, and generalizing. My second research question examines the conversational routines that promote or limit critical reflection. Building on the

work of Horn and Little (2010), I examined these four routines through the lens of critical reflection. These conversational routines (see Table 2) would be most prevalent during the collaborative inquiry components of planning for action, analysis, and making practice public.

Levels of Reflection

There are varying levels of reflection outlined in the theoretical and empirical literature, with critical reflection commonly identified as the highest level of reflection (Harvey et al., 2010; Hagevik, Aydeniz, & Rowell, 2012; Larrivee, 2000; Mezirow, 1990; Wald, Borkan, Taylor, Anthony, & Reis, 2012). I drew on the work of Farrel (2004), Van Manen (1977), Larivee (2008), Harvey et al. (2010), and Wald et al. (2012) to assist me in distinguishing between the different levels of reflection. There are no generally accepted definitions of the various levels of reflection, though many have developed their own levels (Harvey et al., 2010). Van Manen (1977) proposed a hierarchical representation of three levels of reflection: technical, practical, and critical. Technical reflection is focused on an efficient way to achieve an expected goal, with more attention being paid to the methods than on evaluation of results. At the level of practical reflection, teachers pay close attention to the environment and the effect it has on teaching practices. During practical reflection, teachers analyze the significance of their experiences and their assumptions while teaching. At the highest level of critical reflection, it is believed that teaching practices are laden with values such as concepts of equity or justice, which may have been distorted or repressed due to social, political, cultural, and historical reasons. Through critical reflection, analysis, and inspection of the value systems, teachers become aware of their own biases and seek to expose repression and dominance.

Larrivee (2008) contrasted reflective practitioners with non-reflective practitioners and categorized reflection into four levels: pre-reflection, surface reflection, pedagogical reflection,

and critical reflection. At the pre-reflection or non-reflective level, teachers are reactive and respond to situations automatically without conscious consideration of alternative actions. At the surface level of reflection, teachers focus on strategies that help them reach pre-determined goals without considering the value of the goals themselves. Surface reflection is most similar to the term technical reflection, used by Hatton and Smith (1995), Farrell (2004), and Van Manen (1977). When teachers reach the pedagogical level of reflection, they are able to apply the field's knowledge base and current beliefs to their teaching practices. At this level, teachers engage in pedagogical reflection, seeking to understand the theoretical basis for classroom practices and align theory with teaching. Pedagogical reflection can be compared with the definition of conceptual reflection in Farrell (2004) and the definition of practical reflection in Van Manen (1977). Finally, Larivee (2008) described critical reflection as the ability to reflect on the moral and ethical implications and consequences of teachers' classroom practices for students, focusing attention inwardly and outwardly at social conditions.

Wald, Borkan, Taylor, Anthony, and Reis (2012) also advocated for four levels of reflection and developed a rubric assessing reflective writing in their study evaluating reflective capacity in medical education. Their rubric distinguished between four levels of reflection: habitual action (non-reflective), thoughtful action or introspection, reflection, and critical reflection. The authors defined habitual action as superficial and vague without reflection or introspection. Thoughtful action or introspection included writing approaches that elaborated on impressions without reflection. The third level, reflection, involved moving beyond reporting, to reflecting by trying to understand, question, or analyze the event. Finally, the writing was considered to be at the level of critical reflection if exploration and critique of assumptions, values, beliefs, biases, and the consequences of actions were present. I reference the extensive

literature review of Harvey et al. (2010) and summarize the types of reflection commonly recognized in the literature into three separate levels of reflection: surface, pedagogical, and critical. Surface reflection is an initial level that focuses on teaching tasks, actions, or skills within an isolated event. Pedagogical reflection is an advanced level that considers the theory and rationale for current practices. Finally, critical reflection is a higher order level where teachers examine the ethical, social, or political consequences of their teaching, striving to become fully present. At this level, teachers strive to connect their practices with their values and beliefs.

I drew upon the work of Farrel (2004), Van Manen (1977), Larivee (2008), Harvey et al. (2010), and Wald et al. (2012) to define the four levels of reflection used for this research. I included the additional level of non-reflection advocated by Wald et al. (2012) and Larivee (2008) so that I may make the distinction between reflective and non-reflective conversations.

- Non-reflective: a superficial and descriptive level that does not include analysis, meaning making, or consideration of evidence and past instruction on future actions.
- Surface/technical reflection: an initial level focused on teaching functions, actions, or skills with little or unclear analysis or meaning making of past instruction.
- Pedagogical reflection: an advanced level that considers theory and rationale for current practices, seeking to align theory with practice using evidence and exploring multiple alternatives. This level does not involve confronting assumptions and underlying beliefs, questioning commonly-held practices, or observing one's own thinking.
- Critical reflection: the highest level of reflection that invites multiple perspectives and includes recognizing and confronting assumptions and underlying beliefs and values. At this level, teachers also reflect on the ethical, social, and political implications and

consequences of their actions by questioning commonly-held patterns of practice, and observing themselves and the processes of their thinking.

Transformative Learning Theory and Teacher Learning in Collaborative Inquiry

As I examined research question three, I was most interested in and looked for evidence of transformative teacher learning. Transformative learning is the process of effecting change in a frame of reference (Mezirow, 1991). Mezirow (1997) defined frames of reference as the structures of assumptions through which we understand our experiences. According to Mezirow (1997), we tend to reject new ideas that don't fit into our preconceptions, often labeling them as nonsense, irrelevant, or weird. Transformative learning is a process by which we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, and mindsets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action. The process of transformation involves a reformulating of our existing structures for making meaning. It is associated with an increase in individual developmental capacities and involves a shift in how a person actively interprets, organizes, understands, and makes sense of their experiences (Drago-Severson, 2009). Mezirow (1990, 1997) believed that critical reflection on the assumptions by which our interpretations, beliefs, and habits of mind or points of view are based is a precursor to transformative learning. He contended that in order to become critically reflective, we need to learn to solve problems instrumentally while involved in communicative learning. The process of transformative learning involves transforming frames of reference through critical reflection of assumptions, validating contested beliefs through discourse, acting on one's reflections, and critically assessment (Mezirow, 1997).

Scholars have looked at the different kinds of knowledge acquired by collaborative

teacher teams. Timperley and Alton-Lee (2008) synthesized findings from 97 empirical studies that identified the development of the kinds of teacher knowledge that have demonstrated positive impact on outcomes for diverse learners. They posited that professional learning opportunities in which the greatest gains were evident were those that sought to deepen teachers' foundations of pedagogical, content, and assessment knowledge. Cosner (2011) examined the evolution of student learning knowledge among teachers over a three-year period and presented literature on how other scholars have thought about teacher knowledge. According to Cosner (2011), studies that have looked at the generation of teacher knowledge often highlighted learning associated with the development of teaching strategies, including content or skill-based strengths and weaknesses of individual or groups of students. Considering the work of Timperley and Alton (2008) and Cosner (2011), I differentiated the types of teacher transformative learning I looked for into three broad categories: content knowledge, pedagogical knowledge, and knowledge of students. Pedagogical knowledge refers to learning about teaching strategies or instructional approaches. Content knowledge refers to learning about facts, concepts, and theories related to a particular subject matter being taught. Knowledge of students refers to learning about the strengths, weaknesses, interests, and backgrounds of individual students or a group of students.

Instructional Outcomes

As I examined research question three, I also looked for evidence that future instruction was impacted as a result of collaborative teacher inquiry. I differentiated instructional outcomes into two categories. First, I looked for evidence that teachers had made general changes to their instructional practice. General changes to practice involved altering instructional methods,

strategies, or learning goals. Second, I looked for evidence of instructional outcomes that included making changes that could be linked to social, ethical, or political consequences.

Chapter Four: Methodology

Research Questions

The following questions have emerged from my understanding of the gaps in the literature:

1. How does the enactment of components within a collaborative inquiry process influence whether or how teachers reflect about their prior instructional practices?
2. What conversational routines among collaborative teacher inquiry teams promote or limit reflection?
3. In what ways does engagement in different levels reflective dialogue during collaborative inquiry impact teacher learning and instructional outcomes?

Research Design

This study used a multiple case method and a cross-case comparison to determine commonalities and differences across four cases from two different schools (Cresswell, 1998; Merriam, 1998). The multiple case study design is based on criteria for case study research methods established by Yin (2009), Stake (1995), and Merriam (1998). In this study, the collective multiple case methods (Stake, 1995) utilized attempt to describe and compare team experiences in order to provide insight into an issue (Creswell, 2005), the aim being to identify themes in the data that may lead to the development of a hypothesized repeatable framework for a collaborative inquiry model that promotes critical reflection and teacher learning. Multiple case study design methods are common in educational research and have been used by many researchers studying topics similar to mine (Borko, Wolf, Simne, & Uchiyama, 2003; Brookhart, Moss, & Long, 2010; Brown & Macatangay, 2002; Goodnough, 2010; Leithwood, Leonard, & Sharratt, 1998; Levin & Rock, 2003; Levine & Marcus, 2006; Nelson, 2008; Zhao, 2012).

Further, evidence from multiple cases is often considered more compelling than single case studies (Herriott & Firestone, 1983; Yin, 2009).

A multiple case study design was selected to provide a sample variety and strengthen generalizability. Cases varied by grade level taught, teacher experience, teacher demographics and enactment of components within the inquiry process. Heriot and Firestone (1983) noted that having sample variety offers a greater possibility for finding regularities and for determining contextual influences. The adoption of a case study methodology allowed the data to be collected within its 'real-life' context (Yin, 2009), thus providing both a description and explanation of the dialogue occurring during team discussions, reflection level reached, and learning outcomes observed. Yin (2009) described case study as "an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon are not clearly evident" (p. 18). Merrian (1998) suggested that a case study is an exploration of a "bounded system" or case over time that involves collecting multiple sources of information that are rich in context.

Selection of Cases

This study focused on collaborative inquiry teams from two different elementary school districts. The school districts were selected because both had schools that claimed to implement a rigorous collaborative inquiry framework. One school from each school district was selected for study. The names of the schools have been replaced with fictitious names in order to protect their identity. Although each school follows a collaborative inquiry model, there are differences in how the models are enacted. Understanding how components of an inquiry cycle are enacted and the impact on critical reflection addresses my first research question, so it was important that each school offered variability in how the inquiry cycle was carried out. Two teams from each

school were selected for study. Teams were similar in that they were all teaching at the elementary (K-5) level and were part of a grade level team. Gallimore et al. (2009) found that job alike and school based inquiry teams had more positive outcomes. In the elementary grades, this included grade level teams. Collaborative inquiry teams that are already part of an existing team or are in a comparable role may exhibit higher levels of trust, share a similar vision, and have more built in opportunities to collaborate (Saunders et al., 2009). Teams offer some diversity as they represent a variety of grade levels in order to be more representative of the broader elementary school teacher population. Studying multiple teams from two different schools and districts provided me with a broader perspective, allowing me to compare similarities and differences across settings (Stake, 2006). To increase the validity and the generalizability of my results, there were certain team criteria that remained constant. It was important to keep team conditions as constant as possible so that differences related to critical reflection could not be attributed to factors that were outside of my study. For that reason, all teams selected for study met the following inclusionary criteria:

- grade level teams;
- underwent formal and ongoing training in implementation of the collaborative inquiry process;
- frequency of meetings at least once per week;
- mandated participation in collaborative inquiry;
- elementary school level;
- area of collaborative inquiry focused on literacy instruction; and
- collaborative inquiry process included the following components: problem identification, developing a shared vision, planning for action, analysis, and making practice public.

Principals at each school had conceptualized a collaborative inquiry process and provided teachers and team leaders with supporting structures for enacting the process with a certain level of autonomy. During initial conversations with principals from these two schools, both principals verified that the collaborative inquiry process included the five components that I had previously identified from the literature as essential to the process: (a) problem identification, (b) development of a shared vision, (c) planning for action, (d) analysis, and (e) making practice public. However, there was variability between the two schools in how each of these components was enacted, and this assisted me in addressing research question one (see Table 3). Since both of the schools varied in how these components were carried out, I was able to draw conclusions about how these differences impacted critical reflection.

Site one. Lyndale Elementary School is located in a northwest suburb of Chicago and serves students grades one through five. At the time of the study, 4% of its 446 enrolled students enrolled were considered low-income and there was a mobility rate of 8%. Students with disabilities made up 9% of the student population and 6% of the student population were English Learners. Demographic data showed 67.9% of students as White, 18.8% as Asian, 7.2% as Multi Racial, 5.2% as Hispanic, and 0.9% as Black. The average class size was 21 students. The district allocated approximately $7,705 per pupil on instructional spending and had 93% of students meet or exceed state standards in 2014 compared to the state average of 59% (Illinois Report Card, 2014).

Lyndale's school district has been recognized nationally as a Model Professional Learning Community (PLC) by All Things PLC, which is sponsored by Solution Tree. Criteria for being recognized nationally include commitment to professional learning community concepts such as promoting a collaborative culture with a focus on learning for all, collective

inquiry into best practices and the current reality, action and results oriented goals, and a commitment to continuous improvement. Additionally, in order to be recognized as a Model PLC, schools must submit evidence that PLC concepts have been implemented for at least three years and show clear evidence of improved student learning. Grade level or subject area teams work together to develop specific, measurable, attainable, results-oriented, and time-bound (SMART) goals and carefully monitor student achievement data with the goal of improving student performance. Both teams at Lyndale developed SMART goals in the area of math during the 2014-15 school year. My study focused on collaborative inquiry teams addressing literacy instruction so all data collected at this school pertained to inquiry efforts targeting literacy. When this study was conducted, Lyndale Elementary was in its tenth year of implementing a PLC model, though the term PLC was deemphasized as the principal noted that it was "just how they work." Teams were provided time each week during their contractual day and supported by instructional coaches and specialists who also attended team meetings. Elementary teams were required to meet a minimum of two times per week during 45 minutes of common plan time. Teachers were selected as team leaders and offered additional professional development, training, and meetings with other team leaders and the principal throughout the school year to support the work of their collaborative team. Each team identified a SMART goal focused on student learning and aligned with one or more school goals. There were four guiding questions at the forefront of team meeting discussions: What do we want students to know and be able to do? How will we know when they're there? What if they are struggling and not reaching it? What if they already know it? The school district had developed pacing guides and learning targets for each grade level which drove much of the discussion at team meetings. Lyndale Elementary has conducted benchmark assessments utilizing common formative assessments (CFAs) towards

learning targets six times per year. This data has been regularly reviewed at team meetings.

Case one. Team one was made up of four second grade teachers from a self-contained classroom. Although instructional coaches (extended learning coach and literacy coach) and support staff (special education teacher and ELL teacher) attended some team meetings, study participants only included the grade level self-contained teachers. Three of the teachers had been part of the existing team for at least five years and ranged in total teaching experience between nine and 12 years. One of the teachers was in her first year on the second grade team and her third year of teaching (see Table 4).

Case two. Team two was made up of five self-contained fifth grade teachers. Similar to case one, coaches and support staff often attended meetings, but they were not included in this study. Grade level teachers on this team varied in experience ranging from seven years of teaching experience to over 20 years of experience. Two team members had been part of the existing fifth grade team for five or more years. Teacher 3 had been part of the team for three years and Teacher 4 was in her first year on the team (see Table 5).

Site two. Deerbrook Elementary School is located in a northern suburb of Chicago and serves students grades kindergarten through five. Of its 487 students enrolled at the time of this study, 28% were considered low-income and there was a mobility rate of 7%. Students with disabilities made up 9% of the student population and 13% of the student population were English Learners. Demographic data showed 52.8% of students as White, 18.3% as Hispanic, 15.2% as Black, 7.2% as Asian, and 6.4% as Multi Racial. The average class size was 21 students. The district allocated approximately $8,445 per pupil on instructional spending and had 84% of students meet or exceed state standards in 2014 compared to the state average of 59% (Illinois Report Card, 2014).

At this time of this study, Deerbrook was in its fourth year of inquiry implementation. During the 2014-15 school year, protocols were introduced as a means of scaffolding the process and encouraging teams to think more deeply about their learning needs. Teachers had one forty-minute common planning time weekly and utilized a PLC work planning protocol to document their process and learning. The work planning document charted the team's goal or topic, resources needed, and timeline for each month. Additionally, the work plan asked teams to document planning for implementation and reflection on team goals. During the problem identification stage of the process, teams were encouraged to look at data to make speculations about what the problem was and consider supporting evidence. Deerbrook teams utilized ISEL (Illinois Snapshot of Early Literacy) data from the previous school year and MAP (Measures of Academic Progress) scores in reading and math during this stage of the inquiry process. Guiding questions and statements to help teacher teams identify a topic for ongoing study included:

- What specific teaching practices need attention?
- Why is this happening or noticed? (And supporting reasons.)
- What are the instructional decisions that impact the results (positive or negative)?
- What is the PLC goal (teacher strategy)?
- What learning strategies need to be in place to achieve this goal?
- If my practice changes, then I will see ____ in my students.

Teams at Deerbrook had weekly meeting times dedicated to their PLC work during the contractual day and additional times planned during monthly faculty meetings. Each team at Deerbrook had a team leader who was part of the school's inquiry leadership team (ILT). These teacher leaders were provided with training opportunities with an outside consultant and additional planning meetings with other school leaders and the principal throughout the school

year.

Case three. Team three was made up of four third grade teachers. This team was made up of experienced and veteran teachers ranging between 12 and 27 years of experience. They were a fairly new team, as three of the teachers had been part of the third grade team for three years or fewer. For the previous three years, this team had gained one new team member each year. One teacher on this team had been teaching third grade at this school for over twenty years (see Table 6).

Case four. Team four was made up of four fourth grade teachers. Teachers on this team ranged in experience from four years of total experience to 23 years of experience. Three of the teachers had been working together on this team for four years and one teacher joined the fourth grade team this school year (see Table 7).

Summary of Cases

Teams were from the following grade levels: second, third, fourth, and fifth. They varied in size from four teachers to five teachers. Teams from Lyndale (cases one and two) met more frequently, with a minimum of two forty-five minute meetings per week. Teams at Deerbrook (cases three and four) met once per week for forty minutes. There was more ethnic and gender diversity in the teams at Deerbrook, which was more representative of the student demographic data. Team meetings at Lyndale (cases one and two) were larger since coaches and specialists often attended along with the grade level teachers. Overall, teachers from case one had the least amount of experience while teachers from case three had the most experience on average. Every team had at least one teacher who was new to the team. Despite having the most experienced teachers, case three was the only team that had gained a new team member each year for the previous three years. With the exception of the new team member on each team, cases one, two,

and four had at least three prior years of working together on the same team. All four teams had a team leader who assisted the team in developing the agenda, facilitating the discussion, and documenting the process.

Data Collection

The multiple case study design (Stake, 1995) is used for collecting and analyzing qualitative data. Qualitative research focuses on understanding behaviors in settings through multiple forms of data collection (Firestone, 1993). The primary technique for collecting data for this study was through semi-structured interviews with teacher participants and principals, observations of team meetings, collection of team documents and artifacts, and survey data. To ensure reliability and validity of the data, three types of triangulation were used: data source triangulation, methodological triangulation, and member checking (Stake, 1995). For data source triangulation, I interviewed all teachers involved in collaborative inquiry, along with the building principal. Additionally, observational data was gathered at various points of time over different stages of the inquiry cycle (see Table 9). Methodological triangulation included multiple sources of data including interviews, observations, survey data, and document analysis.

Observational data. Three observations were conducted for each case, which totaled six observations at each school and twelve observations across all four cases. Observations are common qualitative data collection methods that have been used in empirical studies looking at comparable issues (Anderson, Leithwood, & Strauss, 2010; Borko et al., 2003; Brookhart et al., 2010; Curry, 2008; Horn & Little, 2009; Levin & Rock, 2003; Nelson et al., 2012; Priestley, Miller, Barrett, & Wallace, 2011; Sherer & Spillane, 2011). All observations were audio recorded and transcribed to document conversations and allow for multiple reviews of the

information. Field notes and my own Reflection Observation Rubric were also used as tools for the collection of observational data.

Field notes. Extensive field notes were taken during the observations and cross-referenced with the Reflection Observation Rubric (see Appendix B) that is elaborated on in the next section. Further, to better understand how components of the inquiry processes were enacted and answer research question one, tools or protocols used during observations of team meetings were captured in the field notes. Building on the work of Horn and Little (2010), my conceptual framework highlights the following conversational routines that emerge from a problem of practice as important to my study: normalizing, specifying, revising and generalizing. These conversational routines were noted and coded in the field notes to assist in answering research question two.

Finally, to assist in answering research question three, during observations I listened to teacher talk in order to determine what was stated during collaborative inquiry that represented learning. Team learning outcomes that were included in my conceptual framework were noted in the field notes. Outcomes were coded and categorized as content knowledge, pedagogical knowledge, or knowledge of students. An example of content knowledge may include team learning related to what components of literacy are taught, e.g. theme, non-fiction, etc. Content knowledge focuses on *what* is taught within a subject area, whereas pedagogical knowledge relates to *how* the content is delivered to students. Teacher learning was coded as pedagogical knowledge if it involved learning about instructional strategies or approaches. Knowledge of students involved new learning about students' interests, backgrounds, strengths, or weaknesses. Finally, I listened for individual self-reports of changes to practice that were made following collaborative inquiry. Instructional outcomes were noted if they involved a general change to

instructional practices or if the changes could be linked to social, ethical or political consequences.

Reflection Observation Rubric. I created the Reflection Observation Rubric as a tool to assist in analyzing conversational patterns in order to understand and determine whether and how teachers reflected. The Reflection Observation Rubric (Appendix B) was adapted from the Reflection Evaluation for Learners' Enhanced Competencies Tool (REFLECT) developed by Hedy Wald, Jeffery Borkan, Julie Taylor, David Anthony and Shmuel Reis (2012) and the Teacher Work Sample Reflection and Self Evaluation Tool developed by Mark Girod and Gerald Girod (2006). I modified the rubric to align with the reflection levels outlined in my conceptual framework. REFLECT was originally developed to evaluate written reflections by medical professionals. This rubric distinguishes learners among four levels: habitual action, thoughtful action or introspection, reflection, and critical reflection. The first three reflection levels in Wald et al. (2012)—habitual action, thoughtful action or introspection, and reflection—are similar to the first three reflection levels outlined in my own research (non-reflective, technical, and pedagogical), but my definition of the highest level of critical reflection differs as it includes the added dimension of considering the social, moral, and political consequences of one's actions. REFLECT was designed to measure the following criteria which provide varying behaviors associated with each reflection level: writing spectrum; presence; description of conflict or disorienting dilemma; attending to emotions; and analysis and meaning making. According to Wald et al. (2012), certain behaviors or thought processes that have been outlined in REFLECT must be demonstrated for one to be considered critically reflective. For example, one must be fully present and attending to one's emotions to be able to recognize and explore personal values and beliefs, which is required of critical reflection. Further, how an individual approaches a

problem or disorienting dilemma and then attempts to analyze the problem or make meaning of the problem or experience requires certain factors (e.g. exploring multiple perspectives, questioning beliefs) to meet the criteria of critical reflection. This original rubric was modified for my research to be used as a way to evaluate reflection levels observed during conversations instead of in written form. For example, the criterion "writing spectrum" was changed to "spectrum" and the wording under that description was changed to remove definitions limited to writing samples. The reflection level titles were altered to align with the reflection levels defined for this research: non-reflective, surface/technical, pedagogical, and critical. REFLECT is theory-informed and was developed following a comprehensive search and analysis of the literature (Wald et. al, 2012). The original authors underwent a rigorous process including repeated iterative cycles of development, determination of inter-rater reliability, reevaluation, refinement, and redesign following multiple development phases with medical students in 2009 and 2010. Overall, the rubric has demonstrated adequate inter-rater reliability, face validity, feasibility, and acceptability (Wald et. al., 2012).

The Teacher Work Sample Reflection and Self Evaluation Tool originated at Western Oregon University during the 1970s and has been adopted by numerous educational agencies including the Renaissance Partnership (Sharp, 2010). It was developed as a means to assist pre-service and new teachers to evaluate their instructional effects on learners (Girod & Girod, 2006) and is empirically validated for helping teacher candidates connect their actions to the learning of their students (Elliot, 2004; Girod, 2002; Girod, Schalock, & Cohen, 2006). The Teacher Work Sample rubrics are considered to be a powerful method of evaluating teacher candidates' instructional effects on learners, breaking down numerous factors and nuances of classroom teacher practices (Girod & Girod, 2006; Sharp, 2010). The criterion of "Critical Analysis and

Meaning Making" used on the REFLECT rubric was further broken down and modified for this research to include criteria and descriptions from the Teacher Work Sample Reflection and Self Evaluation Tool, including interpretation of student learning, connections to instruction, and implications for future teaching. My definition of critical reflection involves challenging one's own belief system and is defined for this research as teachers confronting their assumptions and underlying beliefs, reflecting on the ethical, social, and political implications and consequences of their actions by questioning commonly-held patterns of practice, and observing themselves and the processes of their thinking. For this critical reflection to occur, teachers must be able to connect past instruction with student learning in order to plan for future actions. The concepts and descriptors presented in the original Teacher Work Sample rubric and my own modified rubric helped me to better understand if teachers were engaging in these critically reflective behaviors.

Although individual teachers may demonstrate different levels of reflection, the Reflection Observation Rubric considers the reflection level achieved by the group. As such, the unit of analysis measured on the rubric represents the reflection level achieved by the team as a whole. The Reflection Observation Rubric measured five factors that represent varying behaviors associated with each of the four reflection levels (see Tables 9 and 10). I used a holistic approach to the Reflection Observation Rubric when looking at these five factors; however, critical analysis and meaning making was the most important factor in determining whether or not teams paid attention to past teaching practices and the efficacy of their instruction.

Interviews. Interviews with each study participant were conducted as a means of gathering additional insight into the experiences and perceptions of the teachers engaged in collaborative inquiry and the principals supporting and leading the process. Former studies that

are similar to mine have relied on interviews and used these methods to understand and explain participant perceptions (Datnow, 2011; Coburn & Talbert, 2006; Curry, 2008; Nelson, Slavit, & Deuel, 2012; Richmond & Manokore, 2010). All interviews were recorded and transcribed allowing for multiple reviews of the information.

Teacher interviews. Each teacher was interviewed once, totaling 17 teacher interviews. Teachers were asked seven questions and interviews lasted approximately 15-30 minutes. All teacher interviews were scheduled following the conclusion of the three team meeting observations. Teachers were asked open-ended questions designed to address research question one and elicit information about the enacted components of the process. I did not define any terms for participants. For example, question 1 asked, "Describe the process your team has gone through."

Interview questions 2, 3, and 4 were designed to address research question two and gather information to better understand the conversational routines that support or limit reflective conversational among inquiry teams. Question 2 asked, "What avenues of reflection have you found the most useful/beneficial?" Question 3 asked, "What avenues of reflection promoted reflective conversations among your team?" Question 4 asked, "Has there been a time within your group discussions when you or someone else on your team has changed their perspective about something? If so, what happened?"

Teacher interview question 5 was designed to gather information and address research question three pertaining to teacher learning and instructional outcomes achieved for teams engaging in reflection. Question 5 asked, "As a result of participating in this process, what, if anything, have you learned about: Your teaching practice? Working with your students? Yourself? Anything else?"

Lastly, interview questions 6 and 7 were open-ended and developed to provide information that potentially addressed all of the research questions. These interview questions provided insight into teacher perceptions of how enacted components of the process may have influenced reflection (see appendix A for interview protocol). Question 6 asked, "How has this process influenced professional reflectiveness, if at all?" Question 7 asked, "As a member of this team, how might this process become more valuable for you and your colleagues?"

Principal interviews. Principals from each school building were interviewed once and asked four questions. These interviews lasted approximately 30 minutes. The principals of each school were leaders of the inquiry process and had provided teams with a framework to follow that allowed for a certain level of autonomy as they enacted each component. Principal interview questions were designed to supplement other data collection sources and provide more information about the history of the inquiry teams and rationale for how the process was expected to be enacted. Questions 1, 2, and 3 were developed to assist in the understanding of how each component of the inquiry process was enacted, while question 4 was designed to supplement other data sources collected to answer research question three pertaining to teacher learning and instructional outcomes:

- Question 1: "Can you tell me about the history of these inquiry groups? How did this process get established and how/when did the inquiry routines emerge?"
- Question 2: "What are the overall goals/hopes for teachers? Students? Anything else?"
- Question 3: "What challenges have you or your teachers encountered related to this process?"
- Question 4: "What are some of the outcomes you've seen as a result of teachers engaging in this process? Outcomes for teachers? Outcomes for students? Anything else?"

Artifacts. I gathered a total of 12 artifacts from teams one and two and 10 artifacts from teams three and four. Artifacts such as work planning documents, team agendas, team meeting notes, SMART goal templates, and final products were collected on an ongoing basis throughout the data collection period. Protocols and other tools used during each team meeting were collected to understand how components of the inquiry process were enacted and address research question number one. Additionally, completed work plans along with team agendas and notes were collected as documentation of the process and to examine for evidence of the different levels of reflection. Artifacts such as work planning documents and templates with guided questions support the understanding of practices that promote or limit reflective conversations and address research question two. Additionally, evidence of the presence or absence of any of the reflection levels during each team meeting was collected through team meeting notes and work plans. Final work products, presentations, and lesson plans were examined as evidence of learning and instructional outcomes. The presence or absence of any of the reflection levels was noted through the examination of learning and/or reflection documented during team meetings in notes and work plans.

Online survey. Quantitative data constituted a minor role in this study, serving as a supplement to the qualitative data gathered pertaining to the learning outcomes observed or reported. Individual and team learning outcomes were quantified using a modified version of the Team Learning Survey in Dechant, Marsick, and Kasl (1993) and a rating scale measuring learning outcomes developed by the National Staff Development Council (Appendix C). The modified online survey consisted of 70 questions measuring six categories: (a) team learning outcomes, (b) organizational learning contributions, (c) team learning processes, (d) team learning conditions, (e) organizational learning conditions, and (f) individual learning outcomes.

The survey was revised to reflect the conditions found in an educational setting. For example, wording in many of the items was changed to replace terms such as "managing" to "teaching," "senior management" to "building administration," "organization" to "school," and "work teams" to "collaborative inquiry teams."

The survey was broken into three parts. Part one consisted of 39 questions measuring five areas: seven items measuring team learning outcomes (research question three), 16 questions measuring team learning processes (research question three), and 16 items measuring team learning conditions (research questions one and two). Team learning conditions were broken into three sub-categories and included appreciation of teamwork (eight items), individual expression (three items), and operating principles (five items).

Appreciation of teamwork. This condition includes the openness of team members to hearing and considering others' ideas. It also reflects the degree to which members value playing a team role and the extent to which they act in ways that help the team build on the synergy of its members.

Individual expression. Reflected in this condition is the extent to which team members have the opportunity to give their input in forming the team's mission and goals, influence the team's operation on an ongoing basis, as well as feel comfortable expressing their objections in team meetings.

Operating principles. This condition reflects the extent to which the team has organized itself for effective and efficient operations; how well the team has established a set of commonly held beliefs, values, purpose, and structure; and how effectively the team has balanced working on tasks with building relationship within the group.

Part two of the survey consisted of 21 questions and three categories measuring

organization learning conditions. The three categories include eight items measuring organizational learning contributions, seven items measuring support for operation of teams and six items measuring support for collaboration within the organization. The online learning survey was administered to all teacher participants. Items 1-60 (parts one and two) of each individual survey were scored according to the Team Learning Survey in the Facilitator's Guide by Dechant and Marsick (1993).

Part three of the survey consisted of ten questions measuring individual learning outcomes and addressed outcomes of interest from my conceptual framework (content knowledge, pedagogical knowledge, and knowledge of students). This part of the survey drew eight questions from a rating scale developed by the National Staff Development Council measuring individual learning outcomes of teachers involved in collaborative work. Two items related specifically to critical reflection outcomes were added in order to better understand whether critical reflection occurred among the teams. The 10 items were categorized under five learning outcome categories: (a) content and pedagogy, (b) knowledge of students, (c) self-awareness, (d) confidence and self-esteem, and (e) connection with team.

Information gathered from items measuring operating principles and organizational learning conditions supplemented qualitative data gathered pertaining to how components of the inquiry cycles were enacted and addressed research question one. For example, a few items measuring operating principles include: (a) we are developing beliefs, values, and guiding principles, (b) we spend much time gaining clarity around our purpose and structure, and (c) we discuss our feelings as well as our thoughts. Items a and b related directly to the essential inquiry component known as developing a shared vision. The third item, discussing feelings, related to reflection as a component of the process. A few examples of items measuring organizational

learning contributions include: (a) individuals have sufficient freedom to make decisions critical to success, (b) facilitators are adept at motivating and directing the energies of our collaborative teams, and (c) leadership generally supports the ideas and recommendations of collaborative inquiry teams. Any unfavorable scores in either category would call for a closer examination of what the barriers were and might suggest that there were external factors limiting the team's ability to reflect critically during the inquiry process.

Information gathered from items measuring appreciation of teamwork and individual expression may address research question two and support the understanding of team dynamics that may influence a team's ability to reflect critically. For example, items under appreciation of teamwork that may support understanding of conversational routines and practice include: (a) we build upon another's ideas, (b) we try to understand one another's viewpoints, and (c) most members are able to express their thoughts clearly. Items measuring individual expression include: (a) members do not have the opportunity to define and develop the team's objectives, (b) speaking one's mind is not valued, and (c) people do not feel free to express their negative feelings about changes. Favorable scores in these areas may indicate a collaborative and congenial environment conducive to critically reflective dialogue. Unfavorable scores in either category may indicate conditions that have a negative impact on reflective conversations and practices.

Information gathered from team and individual learning outcomes and team learning processes supplemented other data collected pertaining to teacher learning and instructional outcomes and addressed research question three. Team and individual learning outcomes measured items in my conceptual framework, including new approaches to work (general changes to instructional practice) and new learning about content, pedagogy, and students.

Questions related to knowledge of self measured teachers' perceptions of how the process influenced self-awareness and critical reflection. Teachers were given a five-point scale and asked to rate the extent that they felt participation in a collaborative inquiry team helped them gain the following: insights into the moral and ethical consequences of their classroom practices; perspective on their strengths and difficulties; and increased self-awareness of their personal values, beliefs, and biases. These three items provided insight into whether teams engaged in critical reflection. Other outcomes included increased confidence and connection with other team members. Organizational learning contribution scores may also provide insight into a team's influence on instruction at the organizational level (see Appendix C for complete survey).

Data Sources for Each Research Question

Each research question was broken down to indicate aspects where information was needed. Data sources and "look fors" were identified to assist in answering each research question.

Research question one. How does the enactment of components within a collaborative inquiry process influence whether or how teachers reflect about their prior instructional practices? Related to this question, I was interested in two things. First, how each of the following components of the inquiry process was enacted: problem identification, developing a shared vision, planning, analysis, and making practice public. Second, I was looking for the presence or absence of the different levels of reflection. Data sources for research question one included observations, teacher and principal interviews, artifacts, and the online survey.

Observations. Field notes recorded the tools and protocols used during the following components of the inquiry process: problem identification, shared vision, planning, analysis, and making practice public. Field notes also captured evidence of the levels of reflection. The

Reflection Observation Rubric was used to analyze field notes in order to determine the reflection level for each of the following factors: spectrum, presence, description of disorienting dilemma, attention to emotions, and critical analysis and meaning making.

Interviews. During teacher interviews, teachers reported how the components of the inquiry process were enacted, and how they limited or promoted reflection during the inquiry cycle. Since the principal at each site had a large role in designing and planning for the inquiry process at his or her building, principal interviews provided insight into how components of the inquiry cycle were supposed to be enacted and a rationale for why certain tools or protocols were in place.

Artifacts. Team meeting notes and work plans provided evidence of the protocols and tools used for each case, as well as evidence of critical reflection.

Survey. The online survey provided operating principles scores for each team. The following items on the survey relate to problem identification, developing a shared vision, and planning: (18) we are developing beliefs, values, and guiding principles; (23) we spend much time gaining clarity around our purpose and structure. The following responses under "Support for Operation of Teams" on the online survey relate to how the components are enacted: (41) facilitators are adept at motivating and directing the energies of our collaborative teams; (44) individuals have sufficient freedom to make decisions critical to success.

Research question two. What conversational routines among collaborative teacher inquiry teams promote or limit reflection? Related to this question, I was interested in the conversational routines demonstrated by teachers during collaborative meetings, and the presence or absence of critical reflection.

Observations. Field notes recorded conversational routines (normalizing, specifying,

revising, and generalizing) that emerge from a problem of practice. The Reflection Observation Rubric measured levels of reflection (non-reflective, technical, pedagogical, and critical).

Interviews. Teachers report avenues of reflection to support reflective conversations during team meetings, as well as the presence or absence of critical reflection.

Artifacts. Relevant artifacts are those that include questions and promote reflective dialogue (e.g. a work plan with guiding questions), and/or provide evidence of the different levels of reflection through documentation of learning and reflection (e.g. team meeting notes).

Survey. Appreciation of teamwork scores provided insight into team norms and routines through the following survey responses: (16) most members are open to new ideas or ways of thinking; (22) we look at issues from multiple perspectives. Individual expression scores insight into team dynamics that may influence congenial dialogue and conversational routines through the following responses: (11) speaking one's mind is not valued; (17) people do not feel free to express their negative feelings about changes.

Research question three. In what ways does engagement in critically reflective dialogue during collaborative inquiry impact teacher learning and instructional outcomes? Related to this question, I was interested in three things: the presence or absence of critical reflection during collaborative inquiry, teacher learning, and instructional outcomes.

Observations. "Look fors" in this data category included: reflection level (non-reflective, technical, pedagogical, and critical); teacher transformative learning outcomes (content knowledge, pedagogical knowledge, and knowledge of students); and instructional outcomes (general changes to instructional practice and changes linked to social, ethical, or political consequences).

Interviews. In teacher interviews, I looked for: reports of teacher learning about content, pedagogy, or students; instructional outcomes that included chances to practice or that had social, ethical or political consequences.

Artifacts. Final work products, presentations, and lesson plans provided evidence of team learning and instructional changes. "Look fors" included: evidence of the different levels of reflection through documentation of learning and reflection on team meeting notes and work plans; evidence of teacher learning; and evidence of instructional outcomes as described above.

Survey. Relevant survey areas were team and individual learning outcome scores and team learning process scores.

Data Collection Timeline

Data collection was spread out over the course of five months between February 2015 and June 2015 (see Table 11). Conversations with principals were conducted prior to scheduled observations in order to provide me with a better understanding of the process and supports available to teams and other relevant context as I began my observations. Observations were spread out, so that each team was observed three times and across different stages in the inquiry cycle. Principal interviews were conducted toward the later end of the data collection period and teacher interviews were conducted following all observations. The online survey was administered following all observations and interviews. Artifacts and other materials were gathered over time, as they became available. Data analysis of qualitative data and the interpretive analysis combining both qualitative and quantitative data occurred following the completion of the data collection period.

Data Analysis

Each research question was broken into components to identify specifically what information was needed from each data source in order to answer each aspect of the question. All interviews and observation field notes were transcribed and each data source was coded for themes. There were certain factors that were informed by my conceptual framework that I was attending to as I collected and coded my data. These factors included identifying learning and instructional outcomes (content knowledge, pedagogical knowledge, student knowledge, general changes to practice, and changes linked to social, ethical, or political consequences), reflection levels (non-reflective, technical, pedagogical, and critical) and conversational routines (normalizing, specifying, revising, generalizing). As suggested by Miles and Huberman (1994), a visual display was created to show the evolving conceptual framework of the factors and relationships present within the data. A detailed description of each case was included as part of the data analysis. In multiple case study design, analysis occurs at two levels: within each case and across the cases (Ivankova, 2006; Stake, 1995). Analysis within each case occurred prior to analysis between cases and across schools. A detailed description of analysis steps is outlined below.

Analysis of research question one. In order to answer research question one, I needed to determine two things: how each of the inquiry process components was enacted, and the presence or absence of the different levels of reflection. First, I analyzed teacher and principal interviews, artifacts, and field notes to identify how each of the components of the inquiry cycle was enacted for each case, paying close attention to tools and protocols drawn upon for each component. I created a data matrix for each case that showed what was revealed by each data source in relation to each component. I scored and analyzed surveys for operating principles and

organizational learning conditions to determine if survey data was consistent with limitations and benefits of enacted components identified in other data sources. Operating principles assessed whether and how well a team collectively established a set of commonly held beliefs, values, purposes, and structures. According to Kasl, Marsick, and Dechant (1997), the scores for organizational conditions influence the operation of a team. Low scores in this area may influence enactment of components within the inquiry process. Next, to determine whether teachers reflected about their prior instruction practices, I used field notes and audio recordings from each observation to complete the Reflection Observation Rubric and identify the reflection level achieved for each observation. This was added to the data matrix findings for each case. I also examined artifacts gathered during each team meeting to further assess the presence or absence of critical reflection. Finally, I considered the connection between how components were enacted and the level of reflection achieved for each case and across cases in order to understand the limitations and benefits of enactment of each component.

Analysis of research question two. Analysis of research question two was broken down into two parts: conversational routines demonstrated by teachers during collaborative meetings, and the presence or absence of the different levels of reflection. In order to determine conversational routines, field notes and transcriptions from the audio-recorded observations were examined and coded. As part of the analysis of conversational routines during team meetings, I looked for teacher responses to a problem of practice. Each case had identified a global problem that it was working to address, but additional issues of practice were brought up during team meetings that prompted discussion and reflection. When problems of practice were introduced, I gave attention to and coded the conversational routines included in my conceptual framework, including normalizing, specifying, revising, and generalizing, and whether these routines turned

the conversation toward teaching or away. Conversations that turn focus toward teaching encourage teachers to examine their own practice. When conversations turn focus away from teaching, teachers may blame the problem on the student or other external factors.

Teacher interviews and artifacts were used to gain insight into factors that may have promoted or limited reflection. Survey data measuring appreciation of teamwork and individual expression were assessed to support understanding of the collaborative team dynamics for each case. A data matrix was created that showed what was revealed by each data source. Next, to determine the presence or absence of critical reflection, field notes from each observation were used to complete the Reflection Observation Rubric. Information obtained from interviews and artifacts was also considered. Finally, patterns in conversational routines and their levels of reflection achieved were considered in order to make claims about factors that promote or limit critical reflection. Findings were added to the data matrix. An additional matrix that compared information across schools was also created.

Analysis of research question three. Analysis of research question three was broken into two parts: presence or absence of different levels of reflection during collaborative inquiry, and teacher learning and instruction outcomes. Similar to analysis procedures for questions one and two, I used field notes to complete the Reflection Observation Rubric and determine reflection levels achieved during each meeting. Teacher interviews and artifact data were also used to determine the presence or absence of reflection during the process outside of observations. A data matrix was developed to show what was revealed by each data source.

Teacher interviews, observations, and artifact data were collected to provide insight into teacher learning and instructional outcomes. Field notes captured specific outcomes of each team meeting related to teacher learning or changes to instructional practices. In order to make claims

about the relationship between reflection and teacher learning, first I compared the reflection level reached during each team meeting with corresponding teacher learning and instructional outcomes achieved. Second, overall trends and patterns about teacher learning and outcomes identified through the survey data were compared to overarching patterns of reflection on each team.

Establishing Credibility of the Study

Judging the credibility of qualitative research differs from quantitative research. According to Eisner (1991), in qualitative research designs the researcher seeks believability through coherence, insight, and instrumental utility. Trustworthiness is established though a process of verification rather than through traditional validity and reliability measures (Ivankova et al., 2006; Guba & Lincoln, 1982). Hollway and Jefferson (2000) identified four core questions that researchers should ask themselves as they analyze their data (as cited in Glesne, 2011, p. 210):

1. What do you notice?
2. Why do you notice what you notice?
3. How can you interpret what you notice?
4. How can you know that your interpretation is the "right" one?

As part of the data analysis process, I reflected on these four questions. Also, early in the interpretive process, I enlisted the help of my research supervisor in working through portions of my data to develop and apply my codes and interpret my field notes.

Reliability and Validity of Quantitative Data

When collecting quantitative data, reliability and validity of the instruments are critical in decreasing errors that result from measurement issues that might occur during the research

(Ivankova et al., 2006). Individual scores that are consistent and stable are considered to be reliable, and scores that make sense, are meaningful, and enable the researcher to draw good conclusions from the sample are considered valid (Creswell, 2005). Cronbach's Alpha was used to assess the reliability of the Team Learning Survey and measure the extent the instrument produced consistent results. The measure ranges from zero (extremely poor) to one (perfectly reliable). All five categories of the Team Learning Survey were tested for internal consistency and yielded either high or acceptable scores. The overall internal consistency for the entire survey was very high (Alpha = .94) (Dechant & Marsick, 1993).

In an effort to decrease response rate error and obtain a high response rate for the survey, the Dillman Total Design Method was used (Dillman, 2000). One week prior to emailing the survey, I emailed the participants about the importance of their input in the study. Then, one week after being emailed the survey, those subjects who had not yet replied received a follow up reminder. Reminder emails were sent to subjects that had not completed the survey until 100% of participants completed the survey.

Limitations of the Study

The benefits of multi-case study are limited if fewer than four cases are chosen (Stake, 2006). According to Stake (2006), two or three cases do not show enough of the interactivity between programs and their situations. One limitation of this study is that it only included two sites for investigation. This limitation was addressed by studying two teams at each site. Even though only two sites were studied, a total of four teams were part of this research: two teams from Deerbrook Elementary and two teams from Lyndale Elementary. A second limitation of this study is that a relatively small number of observations were conducted for each case. At each site, teams met weekly and a total of three observations for each case provided a limited view of

each team's process. This limitation was addressed through the collection of multiple sources of data that included artifacts that documented each team's year-long process. A third limitation of this study is that participating schools had a higher proportion of white students, and teacher teams were made up of primarily white, female teachers. I tried to address this by selecting schools that varied in their demographic profiles to the extent that I could. According to the National Center for Education Information, demographic data profiling teachers in the United States in 2011 indicated that 84% of teachers were female and 84% were also white. Based on this data, the subjects in my study were closely representative of the larger teacher population. However, expanding this research to incorporate schools with different teacher demographics would increase generalizability of results.

Ethical Considerations of the Study

Ethical considerations were followed during the entire research study. Prior to gathering any data, permission from the Institutional Review Board (IRB) was obtained. An informed consent form was provided to all potential subjects informing them of their rights, the purpose of the study, the research methods, and who to contact with questions. Anonymity was protected by removing all identifiers and coding all survey responses, field notes, observations, and interviews. All data and research materials were stored in a locked file cabinet in the research supervisor's office at UIC. All data will be destroyed after a determined amount of time.

Chapter Five: Findings

Enactment of Components: Research Question One

This section provides findings for research question number one related to how the enactment of components within a collaborative inquiry process influences whether or how teachers reflect about their prior instructional practices. First, I discuss the challenges I encountered in quantifying teacher reflection. Second, I present a summary of my five key findings. Third, I remind the reader of the enacted components that were central to my study along with information about evidence collected from each team for each component. Next, I explain and compare how components were enacted in each school. I then highlight the key differences and similarities between schools for each component and discuss whether or not these differences influenced reflection. Fourth, I provide a summary of enacted components and reflection levels observed during team meetings. Finally, I elaborate on each of my five key findings, including supporting evidence, before concluding with a summary of findings for research question one.

Quantifying reflection. In an attempt to answer research question one, I found reflection challenging to quantify. I confronted four issues when trying to make sense of and classify teacher reflection using the existing rubrics. First, as I referenced the rubric to determine reflection levels, teams often demonstrated facets of various reflection levels identified on the rubric during each meeting or teams often demonstrated most of the features of a specific reflection level on the rubric, but not all. For example, during an observation team three met multiple criteria under "analysis and meaning making" for pedagogical reflection including: a) seeking to understand theoretical basis for prior classroom practice and aligning theory with future practice; b) logically connecting learning goals, instruction, and assessment results; c)

exploring multiple hypotheses for why some students did not meet learning goals including an exploration of past practices and; d) providing ideas for redesigning learning goals, instruction and assessment and explaining what the impact will be on student learning. However, they did not meet the pedagogical criteria that involved using evidence to support conclusions and this particular feature aligned more with the criteria established for the technical level of reflection. This made it challenging to assign a specific reflection level.

Additionally, there were times when I observed teams engaged clearly in one form of reflection and then later during the same meeting engaged in another form. This made it challenging to characterize one meeting as achieving a certain level of reflection. As such, I shifted how I used the Reflection Observation Rubric to take a more holistic view, weighing the act of analyzing a past experience or teaching event more heavily than some of the other features. A second challenge I encountered when attempting to quantify reflection was the problem of determining a reflection level for the group when not everyone on the team was equally engaged in the conversation. For example, while three of the teachers on team four were engaged in reflective dialogue, teacher four's participation was either absent or very limited during each observation. Third, it was difficult to determine a reflection level based solely on the conversations that occurred during the collaborative inquiry setting, as it appeared that teachers were engaging in reflective behaviors related to their inquiry focus outside of their team meeting discussions. An example of this occurred during observation one on team four. Teacher two presented a lesson to the group that she had already implemented with her class. The lesson was a modified version of one that the team had initially planned together. Prior to the meeting, she emailed the lesson plans and materials to the team for review and consideration. During the observation, it was apparent that teacher two had reflected on the original joint lesson and made

adjustments outside of the team meeting. In other words, reflection can be ongoing and does not necessarily stop and start with the conclusion of a team meeting conversation. Fourth, when determining levels of reflection during components that occurred outside of observations, it was often unclear if reflection occurred individually or in the collaborative setting. For example, teachers reported certain practices influenced reflection, but did not discern when and where the reflection happened. Overall, it was easier to differentiate between reflective and non-reflective conversations but it was most challenging to discern between technical levels and pedagogical levels of reflection. As an outside observer, it was difficult to place value on others' reflective experiences.

Key findings. The enactment of components within a collaborative inquiry process is of consequence to whether and how teachers reflect. Four levels of reflection were considered: non-reflective, technical, pedagogical, and critical. Data collected suggests that there were certain factors that promoted or limited reflection on prior instructional practices. During the course of the study, there was very little evidence of teams reaching the level of pedagogical or critical reflection. However, two of the teams did move beyond the technical level to reach pedagogical reflection during some of the team observations. Five key findings are revealed in this section. First, presenting student learning data through the use of a visual display comparing classroom data during the problem identification and analysis components of collaborative inquiry promoted pedagogical reflection of prior practices. Second, when identifying a problem, pedagogical reflection on prior instructional practices was promoted when the problem was connected to an identified instructional problem *and* student learning problem, versus just a student learning problem. Third, whether and how teams utilized student learning data was found to influence reflection during all five focal components of collaborative inquiry. The use of

student learning data elicited evidence-based decisions and instructional considerations about what to teach and to whom, but alone did not promote reflection on prior instructional practices. Further, a lack of student learning data to support conclusions during analysis was found to limit reflection. Fourth, pedagogical reflection was promoted when teachers engaged in joint lesson planning while planning for action. Last, protocols with guiding questions that prompted teachers to consider changes to practice promoted pedagogical reflection during problem identification, planning for action, analysis, and making practice public. However, limitations with regard to these protocols existed as critical reflection was not cultivated during the collaborative inquiry process.

Enactment of inquiry components. In this study, I identified and paid attention to the enactment of five key components that the literature has supported as being essential to the collaborative inquiry process. These components are not meant to be fixed steps, but rather processes that occur within a collaborative inquiry framework. Components include: (a) problem identification (Ermeling, 2010; Kemmis & McTaggert, 1988; Saunders, Goldenberg, & Gallimore, 2009); (b) developing a shared vision (Kemmis & McTaggert, 1988; Louis & Kruse, 1995; Nelson, Slavit, & Deuel, 2012); (c) planning for action (Ermeling, 2010; Kemmis & McTaggert, 1988; Nelson, Slavit & Deuel, 2012; Sagor, 1992); (d) analysis (Carson, 1990; Ermeling, 2010; Kemmis & McTaggert, 1988; Nelson, Slavit, & Deuel, 2012); and (e) making practice public (Clauset & Murphy, 2012; Levine & Marcus, 2010; Louis & Kruse, 1995).

Teachers from each school were provided a framework for enacting collaborative inquiry that included the five components listed above. Teachers were given a certain level of autonomy. For example, teams were held accountable for following through with their collaborative inquiry plan that included the five components but had flexibility in how they structured team meeting

agendas and implemented their plan. Teams had to adhere to curriculum and assessment requirements, but they were provided authority in determining instructional strategies and student groupings. Data collected from each school showed that each team followed through in enacting each of the five inquiry components that have been identified as essential to the process see Table 12). All of the teams were observed engaged in planning for action, two of the four teams were observed in analysis and three of the four teams were observed making practice public. All teams provided artifact data (e.g. work planning documents, team meeting notes) and discussed implementation of problem identification and developing a shared vision during individual interviews.

Comparison of enacted components. Teams within the same school enacted components similarly, but variability occurred between the two schools with respect to the enactment of components (see Table 3). These components are generally sequenced to begin with problem identification, then followed with developing a shared vision and planning for action. Following implementation of the action, analysis and making practice public most often occurred simultaneously. It is important to note that these components are not always sequenced steps to be followed in order but processes that promote a cycle of reflective and action-oriented behaviors. For example, while each team engaged in formal processes for problem identification, planning for action and analysis, these components were found to be fluid at times as problems of practice emerged organically, prompting additional planning, action, and analysis. An example of this occurred with team one during observation three. During a team meeting, team one analyzed student data addressing progress toward literacy targets on recent benchmark scores. During analysis, a new problem emerged about transferring skills to writing, which was unrelated to the literacy targets being discussed originally. The team engaged in additional

analysis and planning to address this problem. Further, the component of making practice public often occurred simultaneously during the component of analysis if teachers were observed sharing student work or reflecting on the efficacy of a lesson. My second key finding indicates that the sequence of these components matters and that identifying an instructional problem during problem identification influences reflection. This is elaborated on in the following section.

Key differences in enactment and influence on reflection. There was one major difference between the two schools, which was not of consequence to reflection but still worth noting. Teams at Lyndale went through multiple formal cycles of the inquiry process that started with a data review following each of their six benchmark periods. The teams at Deerbrook went through one cycle over the course of the school year focusing on one professional learning community (PLC) goal. Though this difference seemed significant, evidence did not suggest that this key difference impacted reflection. Key differences that did impact reflection are elaborated on in each section below.

Problem identification. During the component of problem identification, each school utilized data from the spring of the previous school year and was provided protocols to assist in the identification of a problem warranting action. There were differences in the types of assessment data used and how the data was analyzed. Lyndale used both standardized and formative assessment data, whereas Deerbrook used only standardized assessment data. Lyndale looked at data across an entire grade level and by classroom, while Deerbrook looked at data across the grade level only and not by each classroom. The protocols used at each school varied in that Deerbrook's protocol prompted teachers to consider why the problem was occurring and asked them to list specific teaching practices that needed attention. These prompts framed the problem as an instructional one that influenced reflection as teachers considered past practices as

they planned for changes to future practice. Lyndale's protocol focused on students' strengths and weaknesses and potential intervention needs for groups of students. Lyndale's protocol framed the issue as a student problem, and while this could potentially promote discussion about prior practices, it did not directly ask teachers to consider changes to instructional practices in relation to weaker performing student areas.

Developing a shared vision. There was a notable difference in how the shared vision was developed at each school. At Lyndale, teams aimed to help their students achieve mastery of skills that were provided to them as pre-determined student learning targets. These learning targets were established for each grade level and aligned with their district's pacing and curriculum guides. Teachers at Deerbrook developed a professional learning community (PLC) goal and teacher strategy tied to the identified instructional problem. Evidence collected at both schools suggested that teams were invested in the shared vision, but there were two main differences. The first is that Lyndale teachers were working toward measurable student achievement outcomes, while Deerbrook teachers were working toward implementation of a PLC teacher strategy. Second, at Deerbrook the shared vision was developed collaboratively stemming from an instructional problem and incorporated teacher strategies and changes to practice as part of the vision. Lyndale teachers were provided pre-established student learning targets that focused on student learning outcomes and not on teacher practices. These differences evoked consideration of student learning goals and instruction that influenced future planning, but did not influence reflection on prior practices during the development of a shared vision.

Planning for action. There were four key differences and one similarity in how teams at both schools planned for action. First, teams at Lyndale engaged in a formal planning for action process following each benchmark period six times per year, while teams at Deerbrook designed

their long-term plan for action only once immediately following the identification of an instructional problem and the development of a PLC goal. Second, Lyndale's plan of action tied directly to measurable student outcomes (learning targets), while at Deerbrook the plan of action was tied directly to teacher strategies. Third, teams at Lyndale were working toward measurable learning goals and they utilized data as they planned for student instruction and intervention. The use of student learning data was not emphasized or observed during the planning components at Deerbrook. Fourth, prompts on the work planning protocols at Deerbrook prompted teachers to consider practices that needed attention and the development of a teacher strategy. These questions promoted reflection on prior practices. On the contrary, protocol prompts at Lyndale focused discussion on student strengths and weaknesses. This supported planning for student groupings and future instructional needs, but did not elicit reflection on prior teacher practices. At both schools and across all four teams, teachers engaged in ongoing joint lesson planning that supported the PLC goal or focused on skills necessary for mastery of learning targets. Factors that influenced reflection during planning for action included joint lesson planning, the use of student learning data, and variances of protocol tools.

Analysis. There were three key differences in how each team enacted the process of analysis. First, Lyndale used student learning data and presented the data visually using a data wall. The student data on the data wall was categorized so teams could compare differences across classrooms, in addition to observing the strengths and weaknesses across the entire grade level. Deerbrook relied on anecdotal evidence and did not use student learning data during analysis. The visual display of data was a factor that influenced reflection. Deerbrook did not utilize data during analysis and this was found to limit reflection. Second, Lyndale analyzed student learning data six times per year following each benchmark cycle. Deerbrook engaged in

analysis at the end of the inquiry cycle to consider the efficacy of practice changes. This difference in frequency of analysis or when analysis occurred did not seem to influence reflection. Third, similar to differences noted during problem identification, protocol prompts at Lyndale promoted student considerations, while protocol prompts at Deerbrook promoted consideration of students *and* instruction. These differences in the protocol prompts were found to influence whether or how teachers reflected on prior instructional practices.

Making practice public. Teams at both schools had opportunities to make their practice visible to others and publicize their learning outside of the team through "Show and Shares" and "Museum Walk-Throughs." Principal interviews at both schools revealed that within grade level teams, teachers were expected to make their practice public by sharing individual practices with their colleagues. However, neither school had formal routines in place and each team was provided autonomy in terms of how it executed this component of publicizing its practice. There were similarities in how this component was enacted at each school. At both schools, teachers shared individual practices including positives and negatives following implementation of a lesson for the team to discuss and learn from. Important differences in enactment that influenced reflection pertained to the use of student learning data and protocol prompts. At Lyndale, teams were expected to review and share student work samples and products to assist with planning student groups, analyzing learning, and sharing ideas with each other. This was not reported as an expectation at Deerbrook. Second, protocol prompts on the work planning document at Deerbrook prompted teachers to share lesson reflections with an emphasis on practice changes. The work planning specifically reminds teams to "create opportunities to make new practice changes public by sharing stories and talking through experiences" and suggests that "help

seeking and feedback sharing is paramount." Protocols utilized at Lyndale did not focus specifically on changes to practice.

Enacted components and reflection levels observed. Field notes and observation transcripts were utilized and cross-referenced with the Reflection Observation Rubric following observations to determine the reflection level (non-reflective, technical, pedagogical, or critical) achieved during each team meeting (see Table 13).

Overall, teams were most commonly observed planning for action. During observations, teams frequently demonstrated a level of technically reflective behaviors during team meetings (with the exception of team two during observation three). None of the teams were observed engaged in critical reflection that considered the social, moral, or political consequences of their actions. Both teams from Deerbrook met the criteria for pedagogical reflection during two observations.

Evidence supporting key findings. Evidence collected suggests that there are certain practices within components of collaborative inquiry that promote or undermine the opportunity to achieve levels of higher levels of reflection about instruction. These practices include: (a) the use of visual representation of data during problem identification and analysis; (b) identifying a problem connected to student learning *and* instruction; (c) the use of student learning data during planning for action, analysis, and making practice public; and (d) use of protocols with guided questions focused on instructional changes during problem identification, planning for action, and making practice public (see Table 14).

Key finding one: Visual representation of data across classrooms promotes reflection during problem identification and analysis. When student learning data is presented visually and includes cross-classroom comparisons, pedagogical reflection that considers prior practices is promoted. Teachers at Lyndale were provided with a visual representation of student data used for problem identification and analysis following each benchmark period (six times per year). The review of student data across a grade level, versus teachers having access to data only for their individual classes, created an opportunity for teams to reach higher levels of reflection. Making data visually accessible across classrooms so that teams could compare student assessments to see individual strengths and weaknesses of each class encouraged pedagogical reflection among teachers. When asked about activities that promoted reflective conversations, teachers at Lyndale (school one) on both teams expressed similar thoughts that support this claim.

> **G2, T1:** I would say talking about what worked and what didn't as a team. Even though we all plan together and have the same lessons, as individuals we have different approaches. When looking at the data wall together, if mine looks different then that makes me think…I should try something different.
>
> **G1, T2:** I like to look at all the scores [on the data wall], everyone's scores and reflect on where we have the most kids who need improvement and where we have strengths. If I notice that teachers have a strength in an area that I might be struggling, I can ask them about strategies they are using.

These teachers described reflecting on the efficacy of their past practices and concluding that they were less efficacious than some of their colleagues.

The data wall also encouraged consideration of instructional needs across a grade level, which allowed for teachers to look at problems from a different perspective and plan for

equitable intervention resources across a grade instead of by class. It assisted in shifting the conversation and perspective from a focus on "my students," to "our students" when planning for instruction and encouraged collaboration and reaching out to colleagues.

> **G1, T4:** We have our data wall, which is accessible to everyone. With all the grading we've done, when it's entered we can analyze as a group…looking at the whole grade level. Just last week we planned an intervention for vocabulary. At first we thought we would just send two kids per class, but then we thought…that doesn't seem right. So then we looked at the data and looked at it from the highest need across the whole grade. I had two kids in mind that I wanted to have in a group and you want to advocate for the students in your class, but then you have to look at it as a whole. You have to think, what's best for these kids as a unit? My two kids did end up being the ones from our grade level, but this happens all the time. It's a shift from my kids, to our kids. That's a huge push.
>
> **G1, T1:** Honestly, using our data walls are really helpful because you can think either way…either my students are really understanding this…then you see it in the bigger perspective, and then to have discussions with team mates… How did you determine this target? Or what are you doing with your students who are not quite at the mastery level yet? I just think it gives us all access to see everyone else's…it fosters more reaching out and collaboration. You think okay, this is my class but it's all of us. If you saw someone else's student was continually struggling…it turns it from my students to our students.

Overall, the visual representation of student learning data across classrooms created an opportunity for reflection by allowing teachers to see how their students were performing

compared to other classrooms. As elaborated above, this was reported to encourage the adoption of multiple perspectives as teachers reached out to colleagues whose classroom data in a particular area was stronger than their own. Further, the data wall also shifted teachers' perspectives to consider the needs of the grade, versus the needs of their classroom alone.

Key finding two: Connecting problems to instruction promotes reflection during problem identification. When teachers identified a problem that was connected to student learning instruction, pedagogical reflection on prior instructional practice was promoted. Teams three and four at Deerbrook both identified instructional problems and developed their PLC goals and teacher strategies based on this problem. Evidence collected from their work planning documents shows that the identification of an instructional problem prompted pedagogical reflection and consideration of prior classroom practices for future planning and changes to instruction.

Team four's problems and goals. Team four's identified problems were: (a) students unable to independently ask questions that would drive them to a deeper understanding of text; (b) students not demonstrating evidence of the ability to annotate and respond to text; and (c) students not taking risks to make mistakes as part of the learning process. The team's PLC goal was to deepen the repertoire of strategies to teach students how to actively monitor their comprehension and learn how to model and support the strategies that students need to think critically across texts. Team four's PLC goal was directly correlated to the development of new strategies that would address the identified problems. The following prompt was used as teams developed their vision connected to the team's teacher strategy: "If my practice changes, then I will see…more students engaged deeply in text which will foster the ability for deeper thinking and responding to text." This teacher strategy suggests that practice needs to change and improve

in order to see increased student achievement. Team four's work plan documented teaching practices that needed attention, including increased use of modeling, text selection, increased scaffolding, more explicit and focused instruction, and increased use of annotation during reading. Similarly, team three's work plan identified an instructional problem and developed a PLC goal and teacher strategy with changes to teacher practice in mind.

Team three's problems and goals. Team three's identified problems were: (a) lack of extended response to text (interpretation and reflection), and (b) lack of student understanding of theme. Team three's PLC goal was to increase critical thinking and create better peer relationships between students by learning, implementing, and reflecting using the work plan. Teacher strategies outlined on work plan were to: (a) implement talk and turn as a way of promoting dialogue, and (b) implement Making Meaning lessons and Partner Reading and Content, Too (PRC2).

Teacher one on team three reported looking at her practice differently. When asked about what she had learned about her teaching practice as a result of engaging in this process, she discussed her shift in letting go of certain practices and allowing for more student control:

> **G3, T1:** I know that when we started, it taught me to look at my teaching practices…things that I needed to change in order for students to be successful. Instead of me being the facilitator and instructor, I started giving things over to the students and letting them learn from each other through meaning making activities, think-pair-share, small group discussions. I let them start coming up with the discussion questions…I had to let go of a lot. It was hard at first, but it's become easier and more enjoyable to watch. I think if we set up an experiment, and I was gone and I didn't have a substitute for my class, I think the students could get through the day without me and know what to do!

Alternatively, teams at Lyndale identified problems based on student achievement problems. While identifying gaps in student learning is important, there was a missed opportunity for reflection during this component of the process as teachers at Lyndale did not use this to reflect on the efficacy of their prior instructional practices.

Key finding three: Use of student learning data influences reflection across components of collaborative inquiry. Whether and how teams utilized student learning data was found to be a factor that influenced reflection. First, findings suggest that using student learning data without consideration of prior practices undermines the opportunity for reflection. Second, the absence of student learning data during analysis to support conclusions also undermines reflection.

Data without consideration of prior practices undermines reflection. When teams reviewed student learning data for planning without considering the efficacy of past practices, the opportunity for reflection was limited. Utilizing data was emphasized at Lyndale and teachers reported that using data supported their decisions and promoted reflection. Although teacher reports and artifacts showed that data was heavily utilized at Lyndale, team observations revealed limited use of student learning data during observed meetings. Additionally, observations of teams using data showed that when teachers accessed student data, they reflected on student learning for the purpose of planning student groupings and what to teach next, but did not consider how prior instructional practices may have influenced student learning and achievement. Across all four teams, team one engaged in analysis of student learning data during one observation. An example of how data was used during a team meeting when analyzing student progress to plan for action was evidenced through observation three of team one. During the observation, this team reviewed recent benchmark scores to plan intervention groupings and

determine instructional needs of the groups. They connected student learning with assessment results and made changes to student grouping and instruction. However, the team failed to consider how prior instructional practices may have contributed to student learning.

Utilizing student data influenced instructional planning in team one in a few ways. First, the data inspired questions about what students were learning and considerations of the appropriateness of student groupings. Second, the team questioned student mastery criteria and considered how data compared with daily classroom performance:

> **G1, T2:** Should we go on to the next pattern? Like after long vowels?
>
> **G1, T4:** But then I think we could look at a whole new group of kids at that point.
>
> **G1, T3:** We have to go back to the initial assessment.
>
> **G1, T2:** What's the next one after long vowels? Does anybody know?
>
> **G1, T1:** I mean, do you feel like they got it when they're getting 13/26 or 14/26 [on Common Formative Assessment]?
>
> **Coach**: Well, what are you seeing in their writing?
>
> **G1, T2:** [Regarding a student in her class] I don't feel like anything is transferring into her writing. Like this indication is better than anything she does on her daily writing.
>
> **G1, T4:** [Regarding a different student] She has had some slight improvement in her writing, it's not stellar but I feel comfortable pulling her out of this group. She hates going and she constantly asks about it, so if she's that much higher than the rest of the group I think we need to pull her.

The team further reviewed classroom and grade level scores and confirmed which students would be exiting an intervention group, which students would join, and changes to what would be taught in the group. Below is an excerpt from the team meeting providing an elaboration of

how student intervention groups were revised and plans for future instruction evolved. At one point, the coach suggests that the program used by the classroom teachers (Words Their Way) was not working. This could have been an opportunity to reflect on the efficacy of that practice, but instead of considering changes to their own practice, the team plans for Tier 2 interventions outside of the classroom. As the conversation goes on, the team discusses one student's ("Tommy") specific learning struggles and deficits. Again, instead of reflecting on prior practices, the team moves into planning his intervention. (Names have been changed or removed to protect teachers' and students' identities).

Coach: So I guess I can pull all the Tier 2 kids plus James. [Reads list of students].

G1, T1: Well, I guess, but like Tommy is even worse than James and the only reason Tommy isn't in the group is because he goes with the intervention teacher [name removed].

Coach: Okay, so we're talking Suzy, Jessy, Evan, Lyle, Tommy, James.

G1, T3: Not Lyle…are you thinking about my Lyle for reading support?

Coach: No…I was just thinking, if I'm going to do this then I'd rather do all the Tier 2 kids…who else?

G1, T1: You mean who else is in here [who performed below benchmark on assessment] that's not already Tier 2?

Coach: Yeah…

G1, T1: Ryan has 19…it's better than the others [already part of the intervention group]…

Coach: At this point we're talking Tier 2 kids, and it doesn't seem like Words Their Way is making that much of a difference unless you're seeing it impact their reading…like is it

impacting their accuracy or something like that? So let's try switching them to that Tier 2 group on Tuesdays and Wednesdays, it's going to be quick.

G1, T4: So, my Ella and your kid [to teacher one] are done? The remaining kids are now going with Suzy and Evan in the morning?

Coach: Right, and I honestly don't think Connor needs it anymore…he can do it..

G1, T4: He just needs to do more of it now.

Coach: Let's do that, which leaves specialist [name removed] open to some other types of intervention, like maybe Rhyme Magic…working with rhyme patterns and words and taking vowel patterns and pairing them with words. What I see it doing is teaching them that they can't just look at the beginning, they have to look at the whole word…middle and end.

Specialist: Do you think for Tommy it would be helpful to stay? I can see that they don't have time to do that in specialist's group?

G1, T1: Should he do both? [Stay in Words Their Way group and join Rhyme Magic Group.]

Specialist: I don't see why not.

Coach: So he'll go in the morning and then he'll go at 10:30 too?

G1, T1: I think he needs all he can get.

G1, T4: So one thing we could explore is what we talked about as a team. So we're meeting with his mom next week and it sounds like he's going to start speech services for a very specific oral language deficit is what she's thinking. So he cannot process oral information. Like, at all. You ask him to raise his hand and ask him something you literally just said and he can't tell you that.

Coach: To be fair, he wasn't paying attention.

G1, T4: I know there is a focus issue too, so he's going to start getting speech services but he struggles with reading and writing too. Like opinion writing especially, and I know it's not like totally uncommon…but I don't know, he just really stands out to me…and I'm not exactly sure what that is…

G1, T1: So you're wondering if the intervention teacher could do some one on one with him…but what would that be?

G1, T4: I don't even know what that would be? I wish somebody else could work with **G1, T2**. Does the intervention teacher work with him now?

G1, T4: No, we don't even meet until next week…not sure if she'll start right away or how that works. Is the intervention teacher trained in Write Tools?

G1, T1: I don't know…

G1, T3: Is there a program for sentence building? What's the number one concern?

G1, T4: I'm not even sure. I see it most in the writing, in the actual application, the transfer…He just stands out.

G1, T1: Maybe we should ask speech specialist [name removed] what she thinks..

G1, T2: Well, we have her five days.

G1, T4: Maybe she could start something with him…he doesn't need spelling…maybe she could just read non-fiction text. I wish he had some Write Tools experience, but maybe she could help generating the topic sentence and opinion sentence.

G1, T1: Oh yeah. What if they met however many days they decide…and turn it into a reading response, maybe not so formulaic…but …

G1, T3: Yeah, we have some with prompts already written.

Coach: I mean, if what we're thinking is that we're just trying to get this kid to write sentences, then I wouldn't even make it text based. Just, okay, "Today you get to teach people about anything…what do you want to teach people about?" and have him write.

G1, T4: Yeah, but I can tell you he would sit there and be like, "I don't know."

G1, T3: Could we do the super sentence? Isn't that what it's called? Remember?

G1, T2: You take pictures and you take away the captions…and then they have to write a sentence…

G1, T1: Can he do that?

G1, T4: He could do something basic. He'll sit there, and you'll say, "Give me a sentence about this," and I guarantee it will be hard for him. He'll be unsure of himself, and he's not confident…but maybe if, yeah….it could be, I don't think it has to be very structured like you were saying, we just want him to write about something. Anything. Okay, what else can you say about it? But is that harder if it's not text based? For a kid like him who does fine….because if it's just a picture, all you can say is, "What's happening in it?" but….

G1, T2: I think if it's just trying to get him to write…something he's an expert in.

Coach: Do we have any other kids who need this kind of writing practice? [Team looks at data.]

G1, T2: I could see Makenzie benefitting from this as well, but if you feel like this is for students who need individual attention…

Coach: No.

G1, T2: Because I can see Makenzie really benefiting…sometimes she'll have trouble…I don't know if it's to this extreme, but she'll have trouble taking those phrases from our planner and sometimes she'll just write the phrase.

[The group agrees that Makenzie should join the group with Tommy.]

This discussion was prompted by a review of Common Formative Assessment scores of students across the grade level. As questions were asked, the teachers referenced their student work and data to answer them. Using evidence helped the team look for patterns and narrow their instructional focus for individual and groups of students. Even though this team used evidence to support conclusions, explored multiple hypotheses for why some students did not meet learning goals, and provided ideas for redesigning instruction, they did not consider prior instructional practices and this undermined their opportunity to reflect and learn more about the efficacy of their own teaching. Despite this, during their interviews teachers on this team emphasized student data as a factor that promoted reflection. When asked about factors that promoted reflection, the response from teacher one on team one suggests that data can help focus conversations during analysis:

G1, T1: I think the same thing [referring to use of data wall], although it's difficult to have data to look at and to drive the conversation, it's much more beneficial than to be going off in a million directions which we all do, but it keeps us focused. We struggle personally and professionally. Okay, how accurate is this because this question wasn't measuring what we wanted to assess? But I think that it gives us the opportunity to evaluate the assessment and to see if it's valid and reliable to this target. It's frustrating at times because you're spending a lot of

> time testing, a lot of time analyzing and then we have these discussions, but I think we just have to accept that that's what it is and that's the process.

Lack of student learning data undermines reflection. In comparison, student learning data did not play as large a role with teams three and four from Deerbrook (school two). These teams used assessment data in the early component of problem identification but not consistently during team meetings throughout the inquiry process. Teams three and four reported that the use of student data helped them focus on a problem worth studying further, however these teams did not develop a shared vision with a measurable PLC goal to address this problem. This in itself limited opportunities for reflection on student learning data during team meetings as data was not referenced or used during any of the observed meetings nor was it evidenced through the collection of artifact data. This failure to utilize student learning data made it more difficult for teachers to quantify student progress, or lack of progress, towards a shared vision. Instead, the teams relied heavily on teacher reports and anecdotal evidence of student learning and engagement which limited opportunities to reflect on past practices. For example, during observation three of team four as it was engaged in analysis and making practice public, teachers reflected on the implementation of a lesson they had planned together as part of their collaborative inquiry process. Each teacher took turns sharing his or her experience and described levels of student engagement during the lesson. During this observation, the team engaged in multiple aspects of pedagogical reflection, including description of the dilemma, attempting to understand an issue, consideration of prior practices, and the generation of ideas for redesigning learning goals and instruction. However, the team did not use evidence to support conclusions (a feature of pedagogical reflection). One of the teachers took notes to add to the team's work plan section under impact on student achievement. On team four's work plan, when

prompted to reflect on how their PLC work impacted student achievement, the final document cites multiple student outcomes which all were obtained through teacher observations and lacked documentation of evidence:

- "Increased levels of student engagement"
- "Students had better sense of what was expected"
- "Students took great pride in their work"
- "Kids had a greater sense of global purpose"
- "Students asked questions about renewable/non-renewable resources"
- "We all felt students dug deep and thought critically"

Teacher observations alone are not always a reliable source of data when attempting to understand student achievement and performance. These teacher observations are worth considering and should not be discounted when analyzing progress toward collaborative inquiry goals. However, these observations would have been more credible if paired with actual student assessment data. An absence of data during analysis, with emphasis on teacher reports and anecdotal evidence, undermines opportunities to achieve higher levels of pedagogical and critical reflection that examines the efficacy of past practices.

Key finding four: Joint lesson planning promotes reflection during planning for action. A collaborative inquiry practice found to promote reflective dialogue among teacher teams was joint lesson planning. This was evidenced through observations and during teacher interviews. When teachers were asked about avenues of reflection that promoted reflective conversations among their inquiry team, multiple teachers across all four teams felt that planning lessons together where one lesson was generated for the team, and then reflecting on how the lesson went, provided meaningful opportunities to reflect and learn from the teaching experience.

This is reflected in the comments from teachers on each team in response to the interview question regarding avenues that promoted reflective conversations:

> **G1, T2:** Talking about how the lessons are going. If somebody tried a lesson first, they can give us tips on better ways to teach it.
>
> **G2, T1:** We want our lessons to be guaranteed and viable. We want all kids to get the same experience, so dissecting the targets together, creating common assessments and lessons helps us stay on point.
>
> **G3, T2:** Being able to say that we're doing this lesson together, that this is where I stumbled, this is where I was successful, hearing them say the same thing and giving me suggestions. Any of that kind of reflection has been the best.
>
> **G4, T3:** Joint lesson plans. Planning jointly and then bringing something back to show the team how it went. To stop and do something together is powerful and meaningful.

During observations, I saw teams engaged in both the planning of and reflection on lessons. Joint planning was most powerful when teams asked questions of each other that promoted analysis and an examination of past instructional practices. This was evidenced during observation three of team four. During this meeting, team members shared individually the positives and negatives of the lesson they had planned as a team. In this exchange, teacher one shares her thinking about student engagement and what she learned from her first experience using graffiti boards as a teaching tool and activity with her students:

> **G4, T2:** So we were talking about engagement, which is interesting since this was a concern and we noticed that a lot of kids weren't showing engagement in their work. So that is a big shift. Why do you think that is? What was it that drove them to be more engaged?

G4, T1: Well, we'd done a lot of work around it, leading up to this activity, so I think they had more…more tricks in their toolshed. They understood more of what was expected and how to really tackle these kinds of articles. They really do like being able to annotate and leave post-its. They enjoy getting hands on in the article rather than reading or just answering the questions.

G4, T2: How about the end product? Did they know what the end product was and what they were working towards?

G4, T1: They knew they were working toward graffiti boards. They said they really enjoyed that activity and that they wanted to do it again. And I said that wasn't a problem this time around because I have several other articles, where every graffiti board will look a little different. Whereas before with the masks, they had a lot of similarities. Um, but they thought that would be great**. I learned from last time that I made the groups a little too big when I did the graffiti boards, so this time I made it smaller…no more than four working on a board and also really taking time to instruct them on the graffiti board, it's not like each of them have their own section…it should really kind of overlap your thinking and their should be conversation…and they got that, you know this time around.** They really did enjoy working on that end product and I think they all wanted to come prepared which is why they delved deeper into the reading so they could have something to share on the board and share with their group. When they came up to present it, they all took pride in their work…they held it so carefully…[laughter]. So I saved them [graffiti board work products], I still have them. I can bring some of them because we did it and then we went on spring break so **I never**

got to have them do some individual ones, which is what I would do next time because now we're moving into the fables. [Emphasis mine.]

Teacher one reflected on aspects of her instruction and discussed changes she would make the next time she used graffiti boards, including smaller group sizes and more explicit direct instruction on how to use the graffiti boards.

After sharing aspects of the lesson that went well in her class, teacher two discussed one group of students who didn't do as well in the final presentation of its product. This resulted in the team coming up with new ideas and additional ways to assess student understanding to better understand and address the student learning problem.

G4, T2: The last group had a harder time. These were all kids that get pulled out. They made a PowerPoint, and the other kids liked it, but I struggled. It was a little loosy goosy and not tied to the text as well…you know Potato Man fueling the world with potatoes. They did get into why the potato wouldn't be enough…but it was a little too much silliness. Eventually they got to it…how can geothermal fill your tank? They had that it can be converted into electricity and then could supply energy to an electric car. They made the leap, but that was the only group that was a little soft.

G4, T1: It would be interesting to pull the annotations and see what kind of annotations they had in terms of other share outs. Were they able to dig? Think deeply? Extend?

G4, T2: So we could pull those. The written piece…I continue to run into challenges. I haven't done that part of it yet…the kids were going to do the written piece.

G4, T4: I mean, we can use their notes, things they have written.

G4, T2: Remember I started that geo survey? I had them do it because I didn't want to lose what had already been created. There was some writing in there, we could amp it up with a geothermal energy survey?

G4, T3: You can have kids give feedback to each other and create a thread. You don't want them to take other's ideas. Their names are on there,…so you can see their thinking in their writing. It's really an incredibly powerful tool.

Coming together as a team to discuss the positives and negatives of how the lesson went can be particularly meaningful and provide teachers opportunities to reflect on their practice. This is especially true if teachers are willing to share aspects of the lesson that didn't go well and open the conversation up for feedback. Considering the findings of Earl and Katz (2010) that educators feel uncomfortable opening their practice to scrutiny, building trust on teacher teams as they engage in joint lesson planning and reflection is essential.

Key finding five: Protocols prompting changes to practice influences reflection during problem identification, planning for action, analysis and making practice public. Variability in protocol design was noted at each school, and the types of prompts on each protocol influenced reflection on past practices during problem identification, planning for action, analysis, and making practice public. Protocol design was found to influence teacher reflection on past practice in two important and consequential ways. First, protocols that explicitly prompted teacher consideration of past practice promoted pedagogical levels of reflection. Second, protocols were found to be insufficient for promoting critical levels of reflection.

Explicit protocols prompting consideration of practices. Guiding questions that were built into the process prompting teachers to reflect on their practice, versus just student needs, were more likely to promote questioning of commonly held teaching practices and consideration

of the consequences of their actions. To elaborate this point, it is important to evaluate the tools and guiding questions that teams at each site used during the inquiry process. At Lyndale (school one), four guiding questions were consistently reflected upon during team meetings and were built into team meeting agendas: What do we want students to know and be able to do? How will we know when they're there? What if they are struggling and not reaching them? What if they already know them?

These four questions focus discussion around students, which is relevant and worth considering. However, by themselves they may not promote conversations about past classroom practice as they do not specifically ask teachers to think about the implications and changes to their teaching. Similarly, teams utilized a different protocol with questions for review of benchmarking assessments presented on the data wall. Guiding questions used during the data wall review limited reflection on prior instructional practices. Prompts on the data review protocol included:

- list notable strengths and weaknesses of the grade level to keep in mind for instruction (Tier 1);
- describe potential interventions needs (Tier 1);
- students to receive regular intervention support as determined by the team and ideas for types of support;
- other overall surprises, concerns, celebrations, etc.; and
- discussion notes.

These prompts by themselves are important in addressing an issue but do not necessarily promote reflection and analysis of the problem or consideration of past practices when planning for action. This claim is supported by evidence collected during observations of team one.

During team discussions, on multiple occasions students were identified as struggling and requiring intervention. The next course of action in these cases was to assign the student to an intervention group led by another support teacher. This was highlighted by the excerpt taken from an observation of team one in the previous section. It seemed in these situations that the intervention was seen as something else, something more, and was different than what was occurring in the classroom. This led teachers away from examining their own classroom practices and relying on outside classroom supports, which in itself implied that the problem or issue was with the student, not the classroom instruction. Additional artifact data from team one support this claim. When completing the data review protocol during one benchmark cycle, the team noted that weaknesses from the grade level showed that students who were lower than the 25th percentile were below average in all areas of reading. Then when asked to describe the potential intervention needs, the team noted "support staff to pull out for additional practice in all areas of reading." Notice the original prompt asked teachers to look for notable strengths and weaknesses of the grade level to keep in mind for Tier 1 (classroom) instruction. Even though the prompt asked teachers to consider Tier 1 classroom instruction, the actual framing on the protocol did not elicit reflection that could promote considerations of the efficacy of current practices or rethinking of practices. The team identified a problem in that students below average were below across all areas of reading, but they did not reflect on or note any implications for changes to their current teaching practices to address these student learning problems.

Alternatively, the protocols and work-planning documents at Deerbrook (school two) included guiding questions that elicited reflection on former teacher practices and an analysis of *why* the problem was occurring to inform a plan of action:

- What needs attention?

- Why is this happening or noticed? (Supporting reasons.)
- What are the instructional decisions that impacted these results positive or negative?
- List specific teacher practices identified that need attention/support.
- PLC goal (teacher strategy).
- If my practice changes, then I see _____ in my students.

These questions are very different compared to the questions reflected on in the protocols used at Lyndale School. Specifically, these questions encourage teachers to identify a problem, consider *why* the problem is happening, and focus on reflecting on their own practice as a means for addressing the problem or student need. As a result, both teams at Deerbrook Elementary identified aspects of their own instructional practices that required attention and developed work plans that incorporated changes to how they deliver classroom instruction. During the second observation of team three while it was engaged in planning for action, one teacher reminded the rest of her team saying, "Aren't we supposed to say how our teaching has changed?" The team protocols used by each team varied, and my findings suggest that questions need to be explicit in prompting teachers to reflect on changes to prior instructional practices.

Individual reflection logs. Another explicit protocol that teachers on team three at Deerbrook used that was reported to promote reflection was individual reflection logs. Two teachers—teacher one and teacher four—developed their own personal reflection logs with questions pertaining to their PLC goal that they reflected on monthly and which assisted them with analysis. Individual reflection logs were not required, but these teachers reported the use of such a tool as promoting their reflective capacities and also as a way of holding themselves accountable to the changes in instructional practices they had committed to implementing. Teacher one's questions included:

- Did I give students the opportunity to have a discussion or dialogue?
- Are students using turn and talk as a way to dialogue?
- Am I giving students a chance to write in their reading response journals to respond to reading?
- Am I prioritizing time to allow for student reflections and self-monitoring?

Teacher four's questions included:

- Do students have a chance to discuss? If so, when?
- Are students using strategies in written response to show understanding?
- Are students creating questions?
- Are meta-cognitive and reading goals addressed?

Teacher one noted during her interview that she asks her students for feedback on the reflection questions:

> **G3, T1:** I have a reflection sheet for myself that I keep and fill out monthly. It's not mandated, but it helps me. It's very helpful. Sometimes I even check myself. A couple weeks ago, there was one question that my students said I can do more of. I ask my students to answer these questions and give me feedback. They said I could do better…that made me think. Then I did do better.

Tools such as individual reflection logs promote features of pedagogical and critical reflection including analysis and meaning making that provide ideas for redesigning learning goals and instruction. Protocols with guiding questions can set the stage for instructional planning and influence the focus of teacher conversations and personal reflection. Guiding questions that elicit

discussion around implications for teacher instruction are more likely to yield reflection on past practices and consideration of the consequences of their actions.

Protocols prompting past practices are insufficient for promoting critical reflection. While certain features of protocols were found to promote pedagogical reflection, these features were insufficient for cultivating critical reflection. Evidence from my study suggests that none of the teams engaged in critical reflection during collaborative teacher inquiry. Even though both schools have long and developed histories engaging in collaborative teacher inquiry, there was no evidence that teams from these schools considered the social, moral, or ethical consequences of their practices within the context of their collaborative inquiry process. The lack of critical reflection within collaborative inquiry may have been influenced by two factors. First, the way in which school leaders framed the collaborative inquiry process may have limited the opportunity for critical reflection. Protocols used were developed with a certain frame in mind, and the framing of the collaborative inquiry process did not emphasize consideration of the social, ethical, or political consequences of instruction. Second, there may be broader issues related to the teaching profession and an educational culture that does not promote critical reflection as part of teachers' instructional work. This sub-finding will be elaborated on in the next chapter.

Protocol design assisted school leaders in framing the collaborative inquiry process for teachers but in some instances the protocols and overall process appeared to inhibit the opportunity for critical reflection. There was evidence that teachers on teams three and four were taking a critical stance toward their work and in a few cases engaging in critical reflection; however, evidence of this occurred outside the scope of collaborative inquiry. Prior to observations one and three on team four, teachers were observed engaging in critical discussions that ended abruptly as the team moved into its collaborative inquiry team meeting. The first

example on team four occurred when teacher four brought up a concern about the dismantling of a dual language program in her former district. The example below highlights a discussion that questions this school district's values and begins to examine the social, moral, and political consequences of the district's actions. As the team waited for the last member to arrive, the following conversation ensued:

G4, T4: I have some not so good news, but maybe you can help.

Principal: We're here to help.

G4, T4: My former district is dismantling the dual language program, they think it costs too much money. Since the new administrators came, there have been some shady things going on and they go against what's best practice for students who need those services—dual language has shown to be the best for those students. So anyway, they are pulling all the English students out of the program. A lot of my friends and colleagues are really upset about it.

G4, T2: It sounds like not all of the voices are being listened to. I'm sorry.

G4, T3: It sounds like a lot of people are being affected.

G4, T2: I almost wonder if they have a Five Essentials. I wonder if that would be a way to come back to the Five Essentials and hear all the voices.

Principal: Maybe you could send them advice.

G4, T2: It's almost like they are operating under a different value set.

G4, T3: It's such a shame to take those Spanish speakers and segregate them like that.

[Emphasis mine throughout.]

The conversation abruptly shifted focus when teacher one arrived and teacher two brought attention to the first item on their PLC agenda. The second example of critical reflection

occurred prior to observation three. While the group waited for everyone to arrive, teacher three shared a concern with the group.

> **G4, T3:** We were dealing with some homophobia at school this week. A student wrote, "Mr. [name removed] is a girl." Then I printed a picture of my family and what I did over spring break. I took them back to my class but accidently left one in the printer. A student wrote "gay" on the picture. That's two incidents in one week. I don't know if it bothered me so much because that was my property and my family. It was written with their left hand to disguise who wrote it. I told the principal [name removed], but I'm not sure who all knows. **It's not just one case. I think it's time to springboard this situation into conversations about diversity and respecting all personal identities.** The other teacher's situation was more public, harking on his masculinity by calling him a girl…this is all taking me back to my middle school experience. I'm sorry to open the meeting with this kid of information. [Emphasis mine.]
>
> **G4, T2:** No, this is important! It's just when it's happening within our own community, it strikes you. This should be a safe place.
>
> **G4, T3:** But teachable moments abound!

Again, once all team members arrived the team pulled up its PLC agendas and changed the subject. In the above conversation, teacher three discussed using this situation to have conversations with students about diversity and respecting all personal identities, but this critical issue didn't permeate into their collaborative inquiry process.

On team three, the example of critical reflection that occurred outside of collaborative inquiry involved the consideration of the consequences of a unit plan and event called Pioneer Day. The team reportedly discussed concerns that the unit was focused on the European

perspective and was excluding other groups. Ultimately, team three changed the unit to include other groups, e.g. Native Americans and slaves, and renamed the unit The Westward Movement. Teacher one discussed this in her interview when asked about a time when she or her team changed perspective about something:

> **G3, T1**: We teach our students how to respect opinions and it's just fine if there are differences in opinions. Teacher two [name removed] brought over Pioneer Day. So last year I did have questions about Pioneer Day from a parent and as a teacher because it seemed like our focus was on Europeans and we were forgetting about other groups who were involved. We needed to consider other groups and perspectives…like Native Americans and slaves. Can we really call it Pioneer Day? Now we call it The Westward Movement. One team member disagreed at first, but then we did the Trail of Tears project and it was so moving for our students that she saw the impact, so we changed the lesson. We always solve our differences.

This example of critical reflection and the shift from Pioneer Day to The Westward Movement was outside the scope of the team's collaborative inquiry process, but a good example of reflection on the social, ethical, and political consequences of teaching actions. On both teams three and four, critically reflective conversations were happening in other places, but not during collaborative inquiry. This suggests that the framing of the inquiry process and how tools are designed at both schools limited the opportunity for critical reflection.

Summary. In sum, quantifying reflection is complex and challenging. With that in mind, there are certain practices that can promote reflection when enacted during collaborative inquiry. The use of student learning data can promote pedagogical reflection when presented visually by grade level and by individual classrooms if teachers use it in a way that allows for comparison

and discussion of the efficacy of classroom practices. Two factors related to student learning data were found to undermine reflection. First, utilizing student learning data for the sole purpose of instructional planning without consideration of past practices undermines reflection. Second, a failure to consider student learning data when analyzing the efficacy of practices also limits the opportunity for reflection. During problem identification, when teams identified a problem and connected the problem to instructional practices, reflection was enhanced and changes to practice were more likely to occur. Joint lesson planning was a practice found to promote making practice public and reflection. Finally, protocols that are explicit in focusing consideration of changes to practice promote reflection on prior instructional practices but is insufficient for cultivating critical reflection.

Conversational Routines: Research Question Two

Conversational routines were found to be of consequence to teacher reflection. In this section, I provide findings for research question number two related to conversational routines that promote or limit reflection within collaborative inquiry. I begin this section by revealing my three key findings. I then provide an overview of the conversational routines that were observed during each team meeting. Next, I elaborate on each of my findings while providing supporting evidence. Last, I discuss trust as a consequential factor influencing reflective dialogue, including the importance of building in structured activities that promote trust and reflection. Trust is an antecedent to collegiality (Cosner, 2012), and teams that reported higher levels of trust also engaged more consistently in conversational routines that supported reflection.

Key findings. Three key findings are revealed in this section. First, the use of revising questions was a conversational routine that created opportunities for pedagogical reflection. Second, conversational routines that turned teacher conversations away from their practice (i.e.

toward external problems or students) limited opportunities for reflection on past practices. Third, normalizing statements that were not followed by revising questions limited the opportunity for reflection.

Conversational routines observed. During my observations of team meetings, I paid close attention to how teachers responded to a student learning or instructional problem, the conversational routines that emerged, and the impact those conversational routines had on the reflection level achieved. Horn and Little (2010) identified the following conversational routines as impacting teacher learning:

- Normalizing: Conversations that define a problem as a normal or expected part of a teaching experience
- Specifying: Questions that elicit more details
- Revising: Questions that invite analysis and activates transition to focused reflection on the problem
- Generalizing: Conversations that link accounts of practice with general principles of teaching

During my observations of team meetings, I recorded the number of times each conversational routine was observed related to a problem of practice and used the Reflection Observation Rubric to determine the reflection level achieved (see Tables 15-18).

Team one. During both observation one and observation two of team one, team members asked a very limited number of questions. Instead, declarative statements were frequently made as the team shared ideas and resources and planned an upcoming project. During observation three, the team asked an increased number of specifying and revising questions that influenced reflection. This observation is discussed further in the next section.

Team two. During observation one and observation three, team two's questions were limited to specifying alone, e.g. "How many sentences are we having them write?" "Are we trying to get them to write more than one idea?" and "What would the theme be?" Specifying questions support the understanding and clarification of an issue, but when used alone do not promote an examination of the value or consequences of current instructional practices. These observations were focused on planning for instruction and exchanging ideas without considering past practice. During observation two, this team asked some revising questions which created an opportunity for reflection. This is discussed more in the next section as related to finding number one.

Team three. Team three was consistent in utilizing varying conversational routines that included more revising questions while discussing an instructional problem. This team also reached the level of pedagogical reflection during two of its team meetings. Overall, a culture of inquiry was more consistently prevalent on this team as its interactions were collegial and, through the use of questioning, members challenged each other to be persistent in working to address problems of practice.

Team four was also consistent in varying conversational routines and asking revising questions during team meetings. It reached the level of pedagogical reflection during two of its team meetings. Overall, observations across the four teams revealed that specifying questions were useful in understanding an issue and clarifying past practices, but needed to be paired with revising questions in order to open up discussions that considered past practice and created solutions for identified problems. My findings were consistent across settings, and suggest that when teams asked more revising questions pertaining to a problem, facets of pedagogical reflection were promoted.

Key finding one: Revising questions promote some facets of pedagogical reflection. Revising questions invite analysis and shift a conversation toward focused reflection on a problem. My findings suggest that an increased use of revising questions promotes facets of pedagogical reflection. Although revising questions created an opportunity for reflection and examination of past practices, they did not necessarily always lead to pedagogical reflection. Examples and evidence of how revising questions promote opportunities for pedagogical reflection are elaborated on in this section. First, I present examples from team three and team four where revising questions led to pedagogical reflection. Second, I provide examples from team one and team two where revising questions created an opportunity for pedagogical reflection, but didn't actually lead to pedagogical reflection.

Team three, observation one. This discussion centered on students not being able to determine the theme of a text. This excerpt demonstrates how revising questions can promote reflective dialogue that leads to changes to future actions:

G3, T4: This is the part we've been working on. I read aloud, but I have kids tell me the theme. It's been really challenging.

G3, T2: It depends on the fable. They had a hard time with "Bad Kangaroo." They just couldn't make the connection.

G3, T4: It depends on their emotional background and where they are. For fables, I have them turn and talk. Then they have to realize that they didn't have a theme. But what I've been…

G3, T1: [To teacher two] Are you saying it's more difficult to figure out theme in genre fables than in fiction? [Revising]

G3, T2: No, I think both. Some pick it out that fast [snaps fingers]. Not everyone agrees with this. You can tell they weren't connecting with each other. They can't get that.

G3, T4: They can't agree or disagree.

Principal: **What in the lesson is guiding them to infer or come up with theme?** [Revising] What strategy did you use? [Specifying]

G3, T2: Modeling, sentence starters. You can have different themes.

G3, T3: Since the theme is hidden, you can ask what the author thinks theme was.

G3, T4: The problem is the theme has to be a universal statement. "Be honest," that's simple for children. These themes are harder for children.

G3, T1: What could we add? [Revising]

[Each team member contributes various strategies and ideas they use in their own classrooms.] [Emphasis mine throughout.]

During this observation, the principal asked a question that elicited consideration of strategies previously used. This generated a new idea and another revising question—"What could we add?"—that promoted the contribution of multiple strategies to incorporate into teaching practices related to determining theme.

Team four, observation two. Team four's increased use of revising questions that invited analysis of their inquiry process led to pedagogical reflection. Discussion during observation two was different than any other observation because it was centered on the team's inquiry process instead of a specific teaching experience. During observation two, this team questioned its current inquiry work plan and redesigned its plan to focus on process instead of product. This excerpt reveals how the use of revising questions encouraged reflection on the efficacy of their current plan and discussion about changing course:

G4, T2: Can you pull up the PLC guide? This was really helpful…we've had lots of derails. It's been hard to have coherence. What do we want to get out of it? I started looking at this on Tuesday and it's been really liberating. We have learned, grown, and changed our practice.

G4, T1: I don't know if we'll ever get to implement the alternative energy lesson, but just through our discussions, it's really changed some of the things I do day to day on my lessons. Like the mask lesson. I never would have done that had it not been shared with the team. The kids loved it. So I do find it has been valuable, even if we never get to the end result.

G4, T2: Our end result is changing practice, it's getting our kids to think critically. So I think we have.

G4, T1: It made us reflect about how we're teaching and sharing, and trying out new things.

G4, T2: So that is something we should continue.

G4, T1: Yes, like examples or a reading strategy sharing. Maybe we should stop focusing on the energy lesson and focus on what we're doing now. **What other strategies can we implement with the work we have to do so that we can get them to think deeper now?** [Revising]

G4, T2: Should we re-set, re-calibrate? [Revising] It's there and we can still use it [referring to energy lesson].

G4, T1: I don't know if I can still do it. My student teacher is starting the fairy tale unit.

G4, T2: It's not about the content anyway; it's about critical thinking.

G4, T1: I'm for continuing the lesson, but I want to start thinking about what we're already working on. I don't want to have to dictate to my student teacher when she starts.

G4, T2: [To teacher three] What are your thoughts?

G4, T3: I want to move forward and see what happens. Maybe even try again?

As the meeting continued, teacher three shared feelings of frustration with the team's inquiry process. The team facilitator followed with revising questions, which helped refocus the conversation back to reflection on teacher practice and future actions:

G4, T3: It's not the product, we need to divorce ourselves from that. I felt like we were set free with the statement about it not being a product [referring to faculty meeting]. It's about the process. We're all going to shift in different degrees and I have to let it go. Collaboration doesn't come easy. It's hard and I end up comparing my pitfalls. I worry too much about meeting a certain level. It was nice to free up, and talk about that today and give it credence. It frees you up to talk about frustrations…the process might not work and if there are any solutions. There were a few people in the group who think myopically, instead of as a group. The collaborative model could feel constraining.

G4, T2: What is constraining? [Revising]

G4, T3: Some people feel they are creating the problem they are trying to solve, but it might not be a tailor fit.

G4, T2: In terms of a shared collaboration? [Specifying]

G4, T3: Should it be more about individuals identifying weaknesses and working together, instead of trying to fit a square peg into a round hole? [Revising]

G4, T2: It sounds like teacher authority. Teachers needing some time to focus on what they want to focus on. Teacher trust is a big factor and pushing the rigor of questioning.

We need to do deep dives into the questions…but it's messy. I need to shift something in my practice to help these kids, but what? I have to bring stuff to the group that I don't feel great about. It may not be what I was hoping to come out of it. [Normalizing]

G4, T1: That's good too…you may not get the results you were expecting, but getting you to think about the strategies you should do now. How do I get them to go from that to putting it on paper? [Generalizing]

G4, T2: So it's an area I needed to go in my practice, but still related to literacy.

G4, T3: It's our second year in this model, and as a staff people will say it's awesome…but there is a lot of trepidation.

G4, T1: Do we need an amazing board [for museum walk-through]?

[Team members shake their heads no.] **Or is it more about our process? What is our process?** [Revising] **What is the goal…to think critically across text?** Were they [students] thinking about it when we started…no. But they are now. And with more exposure and practice it will get better. **Where should we go from here?** [Revising] I'm thinking about where should I go? I've been worried about needing to get that lesson done and now I need to start embracing the enjoyment of the process…we can bring in the masks [part of original lesson plan].

G4, T2: We wanted them to synthesize across texts. We chose two texts. We started with energy.

G4, T1: I love that you brought in the poem, something completely different.

G4, T2: That is what we're doing. Maybe it works, maybe it doesn't. I'm hearing what you're saying. It sounds like we got caught worrying about the product. I want to hear

your thoughts [to teacher four]. We're using this as the conduit. Our analysis, but kids are not engaged if we look back at our goal.

G4, T1: I think the comprehension tool kit is a great tool. I love the National Geographics.

G4, T3: It's quality writing and articles. They love it.

G4, T2: They're really getting into the organizational structure—so cool.

G4, T1: For the writing they had to do for the assessment…I was amazed. They didn't just do three pictures. There was a lot of variety. It all came together for them.

G4, T2: Where can we go? [Revising] Continued collaboration? [looking at PLC guide]. Maybe we offer the possibility of stopping the energy, but I think I probably still will [teachers three and four agree].

G4, T1: Okay, maybe it shouldn't stop. Maybe the *start* should be implement the energy lesson. Enough talking about it, and let's do it! I'll tie it to science since we are getting ready to start our rocks and minerals.

G4, T2: It's science literacy…Okay, let's finalize the energy lesson plan by Tuesday and then implement. Should we target one thing? [Team agrees] **What is the one thing we want to look for in our kids** [Revising]? Student talk? This is what we're looking for…going back to text, making meaning, and generating identifiers.

[Team scheduled another time to finalize and continue planning energy lesson.]

Originally, team four was planning one lesson with a focus on critical thinking, and through discussion and self analysis changed its plan to focus on strategies that teach critical thinking that could be used in day-to-day instruction and allow for multiple cycles of review. The teachers found that they were getting caught up in planning an end product and losing sight of

their original goal. The revising questions asked during this team meeting focused reflection on the problem of student engagement and critical thinking which led the teachers to alter their plan to provide students with more practice. The discussion included an examination of their beliefs, which led to ideas for redesigning their instructional goals.

Team one, observation three. During observation three of team one, the team reflected at the technical level. However, a large number of revising questions were asked which promoted certain facets of pedagogical reflection, including seeking to understand the problem and using evidence to support conclusions. Reflection was limited because this team never considered past practices during this observation. The conversation involved reviewing student data for instructional planning and included focused discussion on concerns related to students struggling to transfer and generalize skills to daily writing. These questions specifically created an opportunity for pedagogical reflection as they invited analysis of the problem (my emphasis in bold throughout):

> **G1, T2:** What's the next one after long vowels? Does anybody know? (Specifying)
>
> **G1, T1:** I mean, do you feel like they got it when they're getting 13/26 or 14/26 [on Common Formative Assessment]? [Revising]
>
> **Coach: Well, what are you seeing in their writing?** [Revising]
>
> **Specialist:** Do you think for Tommy it would be helpful to stay? I can see that they don't have time to do that in specialist's group? [Revising]
>
> **G1, T1: Should he do both** [stay in Words Their Way group and join Rhyme Magic Group]**?** [Revising]
>
> **G1, T1:** So you're wondering if the intervention teacher [name removed] could do some one on one with him…but what would that be? [Revising]

G1, T3: Is there a program for sentence building? What's the number one concern? [Revising]

Coach: I mean, if what we're thinking is that we're just trying to get this kid to write sentences, then I wouldn't even make it text based. Just, okay, "Today you get to teach people about anything…what do you want to teach people about" and have him write? [Generalizing]

G1, T1: Can he do that [write a complete sentence]? [Specifying]

Coach: Do we have any other kids who need this kind of writing practice? [Team looks at data.] [Revising]

These questions helped the team reflect on the student learning problem and focus problem solving and discussion on appropriate student groupings and instructional methods that would address the concern. The team's discussion contributed to increased understandings of students through analysis of student learning data and the multiple perspectives of the group provided different pedagogical approaches for future consideration. However, the group did not reflect on its own prior instructional practices as part of its analysis of the problem. For example, the question "What are you seeing in their writing?" could have led to considerations of how writing instruction had been delivered and whether or not this influenced the outcome. Similarly, the question "Should he do both?" could have led to an examination of the efficacy of the current writing program being used. Finally, the question "Do we have any other kids who need this kind of writing project?" might have prompted an examination of teaching weaknesses that required attention. Had the group members considered how their own instruction might have impacted students' ability to generalize skills in their classes, they would have met all the criteria for pedagogical reflection.

Team two, observation two. During observation two, the literacy coach presented the team with potential new curriculum materials to be used to support instruction towards its learning targets in literacy. Revising questions were asked by team members, which created an opportunity for reflection. However, reflection was limited as the revising questions were met with a declarative statement and not explored by the team. Problems related to how they currently plan for and implement literacy instruction were briefly discussed and overall, the team was engaged and very interested in the review of the new curriculum materials. As team members looked through the materials, revising questions that considered their current learning targets were asked. Specifically, teachers compared the new curriculum unit outline with their current learning targets;

G2, T5: These are in units right? How would this go with our current targets?

Coach: We'll have to revise that, which is another reason we should try to use these as our benchmarks. There are multiple units, almost more than we would want to focus on. We'd have to figure out a way to match what we're doing, but not make it overwhelming.

G2, T2: I'm reading [unit)] one. Look at the two main ideas [showing book to team]…this is exactly what we're doing and it's aligned with Common Core.

G2, T1: If some aren't in there [learning targets], I wonder why? [Revising]

G2, T2: Right, did we miss something? [Revising]

Coach: It's more of a framework so we have some flexibility. It does come with leveled texts, high, medium, low. Those don't relate with theme though. All small group instruction is based on grade level text so they give you a framework for grade level and scaffolding strategies. They give you strategies, so you can think about how to scaffold for lower learners. [Generalizing] [Emphasis mine throughout.]

The revising questions asked by teachers one and two could have turned into a pedagogically reflective conversation examining the value of the teams' current learning targets while reviewing a different curriculum and alternative perspective. Instead, the literacy coach suggested that the curriculum was a framework and the teachers would have flexibility to continue teaching towards the pre-established learning targets. The second part of the statement turned the conversation toward the leveled texts offered with the new curriculum materials and the discussion quickly moved on to a continued review of the materials and future trainings for the new curriculum. The literacy coach did later suggest that, as part of a summer writing project, there could be a re-ordering of learning targets to align with the new curriculum, but she did not acknowledge the possibility of missing learning targets as suggested by teachers one and two. This exchange, which limited reflection, may have been influenced by a few things. First, the team had a lot on its agenda, so an in-depth discussion about its learning targets (which was not on the agenda) may not have been feasible during the allotted timeframe. Second, the literacy coach was viewed as the perceived expert on literacy, which may have created a power imbalance in the group. Her declarative statement may have gone unchallenged because she is seen as the literacy and curriculum expert in the group.

To summarize this key finding, revising questions were found to create an opportunity for pedagogical reflection, but didn't always lead to pedagogical reflection. Revising questions that were paired with consideration of prior practices for future changes to practice led to pedagogical reflection. Reflection was limited when prior practices weren't considered or if revising questions were met with declarative statements instead of exploration.

Key finding two: Conversations that turn focus away from teaching limit reflection.

Conversational routines that turned the focus toward students or other external factors limited the opportunity to reflect on past practices. This point is demonstrated through team exchanges during observation two and observation three of team three. During observation two, teacher two brought up concerns about her students' poor reading responses and a lack of time for instruction. Her comments turned the conversation away from teaching and attempted to direct the problem toward her students or other factors (e.g. lack of time). The other three team members refocused the discussion to turn it back toward instructional practices and simply did not allow the focus of the problem to remain on the students. One notable observation is that when team members turned the conversation back toward instruction, it was often forward thinking and avoided looking back on past instructional experiences. Instead, they asked questions and provided ideas for new strategies. The following excerpt highlights examples of statements that turned the conversation away from reflection on instruction and toward students or other external factors:

G3, T2: We're still bad at writing…horrible writing responses to reading.

G3, T1: A kid told me that we haven't written in our response books in awhile. Can we do that? We were out so many days…I felt so bad.

G3, T2: I'm having problems fitting this in with other kinds of writing. I've got a good six people who stinking cannot write. [Student/time problem]

G3, T4: They need graphic organizers. [Turned back toward instruction]

G3, T1: What about book clubs?

G3, T2: They will not pick up a pencil and actually write! There are too many social emotional issues in my class. [Turned away, framed as student problem]

G3, T1: Let me find a graphic organizer for you. [Turned back toward instruction]

G3, T2: I don't have time to come up with a good question, but I can't even get to that part. [Student/time problem]

G3, T4: Do you want them to write a paragraph? [Turned back toward instruction; specifying]

G3, T2: I want a page.

G3, T3: They might be at that level where they need to fill in the blanks.

G3, T1: I use this in book club reading response questions [hands teacher two a graphic organizer].

G3, T2: I won't accept that at their grade level. They need to support it with evidence.

G3, T1: Then you could do something like this [gives teacher two another organizer].

G3, T4: What about these from Literature Circles [hands teacher two another organizer].

G3, T2: Yeah, this is good; can I get copies of that? All this is going to help me.

G3, T1: When they are accountable and they know they will get a grade, they stay on top of it.

G3, T2: My room would say I don't care. What do I do? Do we care? If they get zeros, so what? [Turned away; framed again as student problem]

G3, T1: No, you have celebrations! [Turned back toward teaching; offered motivational strategies]

G3, T4: You can do an hour celebration and those that didn't do the work have to leave the room. They are cheating themselves out of the opportunity to learn.

G3, T1: Yes, I have that too.

G3, T3: They might be future music teachers…look what [student name removed] made me [holds up student work].

G3, T4: Our future article will continue to work on theme using text-based evidence. We need to have them write a goal.

G3, T1: I've got to get better at that.

G3, T2: Weren't we supposed to say how our teaching has changed? [Specifying]

G3, T1: You know I have a sheet for that [reflection sheet].

G3, T2: I've had to use so much time…I'm definitely using all the skills, I'm doing reading groups…once a week. I've taken a few kids who are my low readers…and boy is it surprising!

G3, T1: When students get used to writing a response to reading, this will improve across the curriculum.

G3, T4: The problem is the box is this big [shows size with hands]. They will give the minimum.

G3, T1: Children who grew up with that paragraph model…they are strong writers. We should go back to that.

[The team continues to discuss additional strategies related to paragraph writing and graphic organizers to use with reading responses.] [Emphasis mine throughout]

Collectively, the statements and questions raised by the team members shifted the discussion back to focus on instructional and motivational strategies that could be utilized to improve students' reading responses. However, their conversations were forward thinking and focused on future ideas and not on the efficacy of prior practices.

During observation three, teacher two made similar statements which framed problems in a way that turned the conversation away from her teaching. Again, the team was consistent in attempting to turn the conversation back toward instruction and the development of a solution.

When teacher talk turned the focus on instruction, pedagogical reflection was supported. Teacher two eventually contributed meaningful ideas that shifted how and when her instruction would address the originally problem. Team members experienced some discord related to constraints they were feeling about how they could address the issues. The focus on external issues again turned the conversation away from instruction and interfered with reflection on the efficacy of prior practices. Team members were open in expressing their disagreement and challenging each other to think differently. Their collegial approach and persistent attention to instructional solutions eventually promoted dialogue that led to pedagogical reflection about past practices and future plans to change their practice.

The team began by sharing approaches to teaching reading responses. Team members asked specifying questions to better understand teacher two's expectations and practice. However, the team did not evaluate or examine the efficacy of that practice. Once again, teacher two raised concerns related to poor student written responses to text. Similar statements that initially framed the problem as a student problem were made (note that teacher one was absent for much of the discussion as she was called away by the office):

> **G3, T2:** We're doing a reading response lesson plan. What do you guys do?
>
> **G3, T4:** I have them use a graphic organizer, incorporating all the strategies that we've done. I have them all do it in both Spanish and English. The inference part is killing them, like what did the author say? What do I think? Then they give me this goofy little paper. They're also doing it for homework, but I'm not really checking the homework. I check what they do in the class. I made you read and I made you write. Sometimes I can catch what they read, or didn't read. Or I can say, okay, where did you come up with this? Why did it say that? Or it says I visualized this and then the questions that they're asked.

G3, T2: Okay, this is what I make them do and I have trouble. This is a question. This is what I'm expecting mine to do [holds up two-page essay]. They go chapter by chapter. They have to tell me a similar experience, like this boy got in trouble so they have to tell me a similar experience. I wrote this, this is my example [holds up paper]. But this is what I'm teaching them. You spit back questions, give reasons without any explanation. And then I put in there, "In the book it says…and I quote exactly." Anyways, this is what I expect my third graders to do. I expect this for reading responses [shows two-page paper again]. Does it have to be this long every time? No, because sometimes you only have a couple ideas, but this is what the end paper in May looks like. It should be this long.

G3, T4: When they write, is it a response to a book they read? [Specifying]

G3, T2: Yeah, but I'm not even doing that because I'm teaching them so I said, compare your life, how are you similar or different to Jack and Janet in the chapter. He got sent to his room and his little sister is teasing him. Okay. So I knew darn well there was a story in their heads. I want you to write. You have to give evidence from your life because you don't have a book and then compare it to Jack's life.

G3, T4: You want a compare/contrast that's an essay, right? [Specifying]

G3, T2: It doesn't have to be, but that's what this is. I needed them to be able to say, this is how we're similar, this is my evidence and this is the text evidence. I can't get this kind of writing in class.

G3, T3: Should I go get an example, since I've been doing response to reading and writing since the beginning of the year as part of my literacy center? I can go get a really strong student, medium, and weak student's stuff?

G3, T4: But are you having them write an essay right? Like every single time they read or after they finish a book? [Specifying]

G3, T3: After they finish a book. But while they are still reading some of the prompts I'm giving them, which are predictions. They don't need to have finished the book, but you do need to have, "what will happen next?" Then compare to another book you've read using two examples.

G3, T2: Any of that is appropriate, I'm doing this more because this is the end paper and this is what I've always been taught to do but when I know they are reading at their desk…

G3, T4: You want them to read something, and be able to respond to a question? [Specifying]

G3, T2: Yes, but what I'm getting is kids think they are done after two sentences. They think they answered the question. Well I'm sorry, that's not what it looks like in third grade. I've lost half my room now. **It's 2:30 when I'm getting to this and they just worked on their feature article and they're gone. I can't get this done, and I keep saying this to [principal] I can't do the curriculum in the district, for the lower kids especially and do this too…**What's most important is this [holds up paper] this tells me what you're thinking and how you do it. **That stupid feature article is such a waste of my time! [Framing problem as student/external problem turning conversation away from teaching]**

G4, T3: Just get it done.

G3, T4: Can you do this in the morning? [Revising]

G3, T2: No, I have math.

G3, T3: That's why mine are coming out good, I do it in the morning when I have my most focused time.

G3, T4: Right after lunch, how are they? [Revising]

G3, T2: I could probably do it…but what I'm saying is I still can't do two writings. **You just don't understand what I have in here [referring to low-performing students]. I have one that just sits here for literally 20 minutes and does nothing and this is for every writing project.** My point is, I can survive one writing a day. But if I'm pulling out feature articles and by the way you're doing this because they didn't do this…**I know we're going to be in the bathroom all afternoon** [referring to students avoiding work; framing problem as student problem]. [Emphasis mine throughout.]

In the next excerpt, the conversation turned toward the curriculum and curriculum timeline. The team engaged in collegial discourse of the efficacy of the current book review assignment, which challenged each other's perspectives. Teacher two turned the discussion away from instruction and toward external factors again, such as barriers caused by district demands and curriculum requirements. Teacher Three persisted in trying to develop a solution that allowed the team to work around district parameters. Eventually, teachers two, three, and four agreed that the book review assignment *could* be enhanced and aligned with reading response instruction:

G3, T3: At this point, we're required to do the current writing curriculum as is, so maybe our goal in this case, and it doesn't have to be literature related, has to be the essay question or compare/contrast on the states? It doesn't have to be…It could be…your feature article is going to look like this. [Revising]

G3, T2: This is an opinion biography paper. Once you know how to do this, this is a simple paper. This is the groundwork for my paper that is coming.

G3, T3: So then you're doing it all already!

G3, T2: But what I'm trying to tell you, this is why I'm not getting quality in the fall and in the winter…because I can't teach this, this is in third grade, they are not asked to do this until the end of the year. But you have PARCC and critical thinking…

G3, T3: I think we've all recently realized that and we have to dip down to second grade [curriculum].

G3, T2: I don't see how a book review is asking anything of these kids. They did it that fast [snaps fingers] when I asked them. They do so much of that in second grade and yet that's one of our writing projects.

G3, T3: Can we change it? Let's just do that? Because we know now.

G3, T2: The point is, an administrator can call us any time and say, okay, third grade, come to the meeting and bring me your…

G3, T4: We're held accountable no matter what.

G3, T2: Yes, and that's where I'm getting frustrated because over here, this is what they want. But the district is not giving us any direction. [Turning focus away from teaching toward external factors, e.g. district]

G3, T3: But I think that's okay and I think this is still a book review if we're still comparing literature. We're just putting it under that title. Because we know we want them to be better prepared. I mean, they wrote this curriculum pre-PARCC.

G3, T4: They're actually trying to align with Common Core.

G3, T3: Right, that's what I'm saying.

G3, T4: I'm trying to figure this out, if they're not doing this earlier in the year…

G3, T3: No, because what they're supposed to do is be able to communicate their thinking.

G3, T4: But this is part of the reading program, not part of the writing curriculum. That's what I think someone would come in and argue. No, this is your reading response, this is how you're able to assess how well…

G3, T3: We're saying that when I was in the new teacher stuff, they are hoping to meld.

G3, T4: In third grade, like in fourth and fifth where you merge the two.

G3, T3: What's the problem? What's the problem with upping [increasing expectations for] the book review?

G3, T4: There's not a problem; this isn't a book review. This is a reading response to a reading to determine how much of the reading was understood and how they can synthesize and evaluate their higher order thinking.

G3, T3: Right!

G3, T2: But that's also what you would do in science.

G3, T4: It's disciplinary reading going with disciplinary writing.

G3, T3: We're doing what they want us to do by upping it. Let's kick out book reviews.

G3, T4: You can't. You can't touch the writing curriculum.

G3, T3: Yes, but you can enhance it!

G3, T4: But you have to remain loyal to what the writing curriculum says. What she [teacher two] is discussing isn't a writing curriculum, it's a response to reading…

G3, T3: I'm not in disagreement with you! I'm saying…

G3, T4: But I would not teach this during reading time, I would teach this during writing time, because I'm analyzing the text and I'm teaching them how to respond to that.

G3, T3: And I'm saying I would do this during both. This is what we're after.

G3, T4: No, because with disciplinary literacy, when it's science time we're going to have to write for science when it's math we'll have to write for mathematical thinking, explain how we solve…same goes for literacy. So for writing we have to expose them to different genres unless we fuse the two.

G3, T3: No. Maybe. But I imagine that this is considered writing and that if we talk to [Administrator] and said we'd like to up this she'd say yes.

G3, T4: Right, but a book review is not…

G3, T3: It could be!

G3, T2: This book review could be in this way exactly. I really like this book; these are the three reasons.

G3, T4: Yes, that makes sense.

G3, T3: That's what I've been saying!

G3, T4: This is about answering a question about a literature piece that was read.

G3, T2: It's the way you write the rest of your life.

G3, T4: You have to write according to the genre. When you write science, you have to sound like a scientist. When you write math you have to sound like a mathematician.

G3, T3: [Sarcastic tone] And when you're writing book reviews, you sound like you're reviewing literature! [Emphasis mine throughout.]

Despite initial resistance by teacher two and team members feeling constrained and confused by district expectations, the evolving conversation about the writing curriculum eventually led the entire team to agree on altering plans for when to teach the book review unit, which also allowed each teacher flexibility to teach it differently. Teacher two proposed teaching

the book review unit in the beginning of the year to allow for increased practice and to better prepare the students for expectations at the end of the school year. The entire team agreed to change when the book review assignment would be implemented, but only one teacher considered changing how the assignment would be implemented (teacher two). Again, the team's focus was on future instruction as it expanded its conversation to include incorporating the skill compare and contrast. Teacher one returned to the meeting after being called away and the team explained the changes to her and then added to its agenda continued planning of its response to reading lesson.

> **G3, T2:** You have to have evidence and support your answers. All I'm saying is that this organization does not come until the opinion paper. If you haven't done any of this, now when they're done at the end of the year, when we need them to do their most important thinking and support an opinion—to me…I want to do that in the fall. Even if they can't grasp it yet necessarily, but…
>
> **G3, T4:** You want to expose them? Would this be part of your reading curriculum instead of writing curriculum? It's a question I'm asking. [Specifying]
>
> **G3, T2: No, what I'm trying to say is, it's so much. That's why I need the writing curriculum to back off, it's too much.** But if I do it in increments. Reading *The Janitor's Boy* with partners. Each chapter is a different skill I can teach in groups.
>
> **G3, T4:** Are they filling out graphic organizers? [Specifying] The more they jot down ideas, when it comes time to write they already have it. When they did the Venn diagram, did they put at least three ideas? If they can do three, they have at least nine sentences. [Specifying]

G3, T2: I saw the responses for PARCC, kids writing one sentence for answers. **If this was implemented earlier…Book review is the biggest waste of time.** I do like the paper on Native Americans where they research but I don't have a finished paper. Unless they did it in this format.

G3, T4: The problem isn't the book review curriculum. You picked a good book now…

G3, T2: The question is nothing. If you do it where you support it with a compare/contrast with meaty text…

[Teacher one returns.]

G3, T3: Right, now we have something that is enticing. What if we stick compare and contrast to another story you've read as initial practice? [Revising]

G3, T2: Or, ask the question, and compare two stories.

G3, T4: We need to have them reviewing stories that are meaty enough.

G3, T2: If we did this in the fall….how about we compare Cook and The Little Hen? They're not hard, but we can work on the skills.

G3, T1: What are we thinking about changing?

G3, T4: Reading responses, they should be more essay style. It makes sense to me. Changing the book review unit—it's a lot to have them respond at the end of the year without more exposure early.

G3, T3: It makes sense to do response to reading instead of a book review.

G3, T1: Across the board, not just book reviews?

G3, T4: We could still use the book review, and [teacher three] suggested adding to it to make it a response to reading.

G3, T2: I read *Squanto*, it has so many rich questions. If I don't get quality writing, why ask the questions? I have to fit it in earlier in the year. The book review…it's so easy. We need to make compare/contrast more difficult too.

G3, T4: It makes more sense to play with that, compare two texts and answer an essay question using a Venn diagram, maybe more characteristics.

G3, T1: The book review is early. What's the first one? Author story…and I always do narratives.

G3, T4: And I would like to do poetry/visualization. Play with it, and ask for forgiveness later.

G3, T2: I was told by a senior teacher, if you do reading and writing every day, you're doing the right thing. **Because of the demands, it's ruining it.**

[Team engages in conversations about dealing with increased district demands/initiatives.]

G3, T4: I'm ready to jump around. I'm getting pressured—and have less autonomy to respond to students' immediate needs.

G3, T1: Talk to me about the component of essay writing. What would we want to see in the fall? [Revising]

G3, T4: What are steps to a good reading response? [Revising]

G3, T2: Spitting out questions, I would work on the first paragraph. They can't write a one-word answer, they have to explain their thinking!

G3, T1: So, you're talking about the hamburger model. I feel old. What did we decide about the lesson plan?

> **G3, T2:** We're doing a lesson plan for reading response. I don't know how we will come up with a team lesson plan. We each do it a little bit different.
>
> **G3, T4:** I'm filling out our next agenda. Students will respond to literature in an essay format. What's the essential question? How do students complete their thinking through writing? Readers use the texts and schema to synthesize and evaluate their reading comprehension.
>
> **G3, T1:** You can make reading response what you want it to be. [Emphasis mine throughout.]

Teacher two's statements often turned problems toward students and away from teaching. However, it is important to note the role she played in promoting discussion on her team. She openly raised issues and also demonstrated high expectations for students, e.g. "I want a page (instead of a paragraph)" and, "I won't accept that at their grade level. They need to support it with evidence." Another teacher on the team highlighted the value teacher two brought to the team dynamics. When asked about a time the team changed its perspective about something, teacher four shared the following:

> **G3, T4:** We've learned a lot about theme writing. Identification of theme drove our instruction differently. Teacher two [name removed] brought that up a lot. She brings a lot of questions, and she brought this idea. Her constant questioning helps us to always go back and always look at it and think about why we do this or that.

Overall, this team as a whole engaged in collegial dialogue that brought challenges to the forefront and persisted in working toward solutions. Bringing attention to problems is important to reflection but when problems are framed as student problems or focused on external factors, reflection is limited. These findings are consistent with others who advocate collegial

conversations and teacher talk that turn discussions toward teaching in order to challenge current practices (Dana & Yendol-Hoppey, 2008; Little & Horn, 2010; Nelson et al., 2010; Timperely & Earl, 2009).

Key finding three: Normalizing statements limit without revising questions. Normalizing statements were found to limit reflection when not followed by revising questions. During two observations of different teams, I observed the use of normalizing statements for similar reasons. Both situations involved normalizing a problem by suggesting it was "developmental." However, the reflection outcomes varied greatly based on the conversational routines that followed the normalizing statement. For example, when teacher one on team one brought up concerns related to a student not understanding the moral of a story, the literacy coach normalized the concern, also turning the problem toward the student and away from instruction:

> **G1, T1:** The fairy tales unit has been really hard…I had the class turn and talk to their partners, which we've been doing for two weeks now. We read "King Midas" and discussed the moral of the story—one student [name removed] said it was "Don't talk to strangers." But, I mean, I get how he could think that, but "sigh." In this version a stranger comes…that's why he thought that.
>
> **Coach: Here's the thing, they're in second grade**.
>
> **G1, T1:** But I had this whole conversation with him to help him see the point…
>
> **Coach: Second graders are so egocentric…he may not have the background. Think about it developmentally. As long as it makes sense to him, I don't think it's bad.**
>
> [Emphasis mine throughout.]

Following this exchange, teacher one appeared unsettled, but accepted this response. These normalizing statements framed the problem as developmental and as a student problem. It also put an end to the reflection and the team did not probe further into the concern. Questions or responses that may have promoted deeper reflection following the normalizing statements include, "Is this story developmentally appropriate for second graders?" or "The majority of the class seemed to grasp the moral, why didn't this student?" Again, the issue of a power imbalance in the group may have contributed to the lack of reflection as the team didn't probe further to challenge the literacy coach and "expert" in the group. Instead, the rest of the group accepted the information provided by the literacy coach without questioning. Power imbalances within teacher teams have been found to negatively influence reflective dialogue (Drennon & Cervero, 2002; Poekert, 2010).

Similar to team one's conversation about finding the moral of a story, a comment was made in team three about a student struggling to identify the theme of a text. One teacher suggested that it was related to the student's developmental readiness. Unlike with team one, the conversation and reflection didn't end with a normalizing statement and acceptance of the problem as developmental. Instead, a revising question following a normalizing statement led the group to generate new ideas:

> **G3, T2:** They aren't into it. They just want the theme and then they think they are done. It's just my room, I'm telling you.
>
> **G3, T4: It could just be developmental. I mean, they are just coming from second grade.** [Rest of team nods and/or comments in agreement.] At least we are exposing them. **I mean, going back to Piaget, can they really think that abstractly?** I'm going to Google this right now [opens laptop].

G3, T2: Maybe they are used to getting answers from their teachers. [Team agrees.]

Principal: This would be a separate topic, could you have them develop little skits around a theme—more interactive? Do they all have their own independent reading book?

G3, T1: They need to fill out a graphic organizer. Or they can write in their journals.

Principal: If they can't conceptualize it, then reading is going to be all the more difficult.

G3, T1: If they are in groups and they have to have dialogue, you could have a captain within the group capture the ideas on a white board.

G3, T2: You will love themes, it's just challenging…

G3, T4: It's critical thinking, and social emotional…the two things we are supposed to be hitting on. [Emphasis mine throughout.]

[Team schedules another time to finish discussing and planning instruction for teaching theme.]

Teacher three questioned whether the problem was due to the student's developmental readiness and generalized the issue to bring in theory. She asked, "Going back to Piaget, are they ready to think that abstractly?" This teacher then proceeded to do an Internet search to look for more information. This discussion led to reflection about student independence and readiness and possible instructional strategies. Normalizing statements during inquiry team meetings can be used to reassure teachers that problems of practice are normal which can promote an environment of trust. To contrast the initial normalizing statements, one response was made as a declarative statement, "Here's the thing, they are only in second grade," while the latter response was posed more as hypothetical: "It could be developmental." This difference in how the statements were presented influenced the opportunity for reflection. Normalizing a problem or

practice, when used alone, can limit reflection by turning the conversation toward factors unrelated to instruction. As exemplified on team three, normalizing statements that are followed with questions promote reflection about an underlying issue. Horn and Little (2010) also found that normalizing statements were a factor that often moved conversations toward or away from teaching.

Trust as a factor influencing conversational routines. As part of the analysis of research question two, I paid close attention to team survey results that measured appreciation of teamwork and individual expression. Appreciation of teamwork includes the openness of team members to hearing and considering others' ideas. It also reflects the degree to which members value playing a team role and the extent to which they act in ways that help the team build on the synergy of its members. A low score in this area may negatively influence collegial conversations and reflection. A high score would promote an environment that supports reflection. I found that all four teams scored favorably in this area, suggesting that team members value teamwork and are open to others' perspectives.

Individual expression is the extent to which team members have the opportunity to give their input in forming the team's mission and goals, influence the team's operation on an ongoing basis, and feel comfortable expressing their objections in team meetings. Items measuring individual expression include: (a) members have the opportunity to define and develop the team's objectives, (b) speaking one's mind is valued, and (c) people feel free to express their negative feelings about changes. A low score in this area may have a negative impact on teachers' ability to express their ideas openly. A high score would reflect a collaborative environment that supports collegial conversations.

Overall, team three had the highest score and rated "favorable" under the category of individual expression (see Table 19). I interpreted this as suggesting that this team has deeper levels of trust that would likely promote a willingness to ask more questions and challenge existing structures and routines. Trust is an antecedent to collegiality, as it promotes feedback seeking, vocalizing concerns, and risk taking (Cosner, 2012). This was the only team where every team member scored favorably in this category. My observations of team three are consistent with these findings and suggest that favorable individual expression scores indicate higher levels of trust that likely impact teacher teams' ability to engage in collegial discourse that promotes higher levels of reflection.

Disharmony and lower individual expression scores had a negative influence on teacher reflection. Team four had the second highest combined overall score for individual expression and achieved a favorable result. However, there was significant discrepancy among team members as two team members scored favorably in this area, one team member was neutral, and one scored unfavorably. This was consistent with what I observed, as there was a significant imbalance of teacher participation during the team meeting discussions. Teachers one, two, and three on team four consistently participated in discussions while teacher four did not contribute any feedback unless specifically asked a question. Across all three observations, teacher four contributed to the conversation only once, when asked specifically to share information about how her lesson went. This observation is supported through comments made by one team member during the interview when asked how the inquiry process might be more valuable:

> **G4, T3:** I think there is more value when each member is giving at the same level. As soon as you have differing levels of engagement, or willingness to participate, it can fall apart. It needs to be 100% at all four prongs.

Similarly, team two teachers differed in their responses: four out of the five teachers rated these items favorably, while one team member rated items unfavorably. Interview data obtained from teams one and two suggest that one factor that may have contributed to the lower individual expression scores on teams at Lyndale Elementary was the larger number of individuals who participated in their meetings. In addition to the grade level teachers, others in attendance included coaches, specialists, and sometimes the principal. During interviews, two teachers from team one and team two indicated that the process would be more valuable if they were given time to meet in a smaller group and have more time to collaborate alone with their grade level team. My observations of the literacy coach's contributions limiting reflective dialogue also point to smaller job-alike groups for promoting reflection. Research has supported job-alike groups made of teachers in comparable roles as promoting trust (Saunders et al., 2009). To summarize, I found that teams with favorable results for individual expression also achieved higher levels of reflection more consistently.

Promoting trust and reflection. Team four engaged in a reflective conversation during observation two that altered the course of the inquiry plan. This observation occurred directly following a faculty meeting where members of the Inquiry Leadership Team (ILT) facilitated a team trust-building activity and reflection activities pertaining to characteristics that promote changes in teacher practice. The team building activity involved giving every teacher a playing card, and asking them to form discussion groups. While in groups, teachers reflected on topics like their values (i.e. what are three values you have in common?), and significant moments in their lives (i.e. share a story about a time when you had to dig yourself out of a hole, or share a shining moment in your life). Next, teachers were asked to reflect on their inquiry team's process

individually and then in vertical teams. They reflected on what they were learning and how their work was impacting their classroom activities.

Following the faculty meeting, team four met to continue their inquiry work. The trust building and reflection activities during the faculty meeting seemed to contribute to the higher level of reflection achieved as they prompted reflective dialogue during the team meeting. This suggests that building in structured opportunities for reflection on the process of inquiry can influence reflective conversations during team meetings. My findings are consistent with other scholars who have suggested that structured opportunities for reflection need to be built into the inquiry process (Ash & Clayton, 2009; Lucas, 2012).

Summary. In sum, critical reflection did not occur during observed teacher conversations, but certain conversational routines were found to promote or limit reflection levels achieved by teacher teams. Conversational routines that created an opportunity for reflection included an increased use of revising questions. Conversations that turned attention toward students or other external factors and away from teaching were found to limit reflection. Normalizing statements may support an environment of trust, but when used alone and without revising questions they limit reflection. Finally, when teachers are comfortable speaking their minds and feel their contributions are valued, higher levels of pedagogical reflection are achieved. As such, trust is a factor that promotes open dialogue and deeper levels of reflection and should be attended to through structured reflection opportunities and activities. These findings point to elements for consideration as collaborative teacher inquiry cycles are planned and implemented.

Impact on Teacher Learning and Instructional Outcomes: Research Question Three

Levels of reflection during collaborative teacher inquiry are of consequence to reflection. This section begins with a presentation of three key findings. This is followed by a review of

transformative learning and the three areas of knowledge I was looking for as I observed teachers engaged in collaborative inquiry. Instructional outcomes and an explanation of changes to practice are then discussed. This section includes information about team learning survey results. Next, I elaborate on each of the three key findings related to research question three. Research question three explores how engagement in critically reflective dialogue during collaborative inquiry impacts teacher learning and instructional outcomes. This chapter concludes with a summary of findings for research question three.

Key findings. Three key findings are revealed in this section. First, pedagogical reflection on prior practices promoted transformative learning about content and pedagogy. Second, pedagogical reflection on prior practices promoted changes to practice. Third, technical levels of reflection limited opportunities for teacher learning and changes to practice. Related to this finding, I discuss potential consequences for teacher learning and instructional outcomes when critical reflection is absent.

Teacher learning and instructional outcomes. Observation, interview, and survey data revealed evidence of teacher learning and instructional outcomes. During observations, I listened to teacher talk in order to determine what was stated during collaborative inquiry that represented learning or practice changes. I paid attention to learning outcomes related to content knowledge, pedagogical knowledge, and knowledge of students. I looked for evidence of transformative learning in any of these areas of knowledge. Mezirow (1997) described transformative learning as a process by which we transform our frames of reference and reformulate (or reframe) them to make them more inclusive, discriminating, and open to change. In addition to teacher learning outcomes I also looked at instructional outcomes that provided evidence of practice changes generally as well as those that evidence social, ethical, or political consequences. A change in

practice is different than experimenting or incorporating a new teaching strategy or resource; it involves altering the instructional methods, strategies, or learning outcomes based on a new understanding about content, pedagogy, or students. I was looking for evidence of teachers reflecting on a past experience or way of teaching, and changing their practice as a result of this reflection.

Survey results also helped me better understand the reported learning and instructional outcomes from engagement in the collaborative inquiry process. The survey measured team learning outcomes, which indicated the level to which a team felt it achieved collective learning as a result of working together. Items measured on the survey included learning outcomes about performance improvements, new ways of thinking, new social norms, work processes or procedures, and new ways of teaching (see Tables 20 and 21). Individual learning outcomes were also measured on the survey. The questions were categorized under five learning outcome categories: Content and pedagogy, knowledge of students, self-awareness, confidence and self-esteem, and connection with team. Items were scored individually and then averaged as a team. Team averages ranging between 3-4 were interpreted as favorable, averages between 2-2.9 were neutral, and averages between 0-1.9 were unfavorable (see Table 22).

Some of the survey data conflicts with other observational and interview data. First, all four teams scored themselves favorably in terms of learning outcomes and in gaining content and pedagogical knowledge. However, observational data of teams one and two did not reveal evidence of teacher learning in the areas of content and pedagogy. Observations and teacher interviews revealed these teachers frequently exchanged resources and trialed new materials (e.g. graphic organizers) that contributed to experimentation of new ideas, but did not emphasize learning about the efficacy of current teaching methods. This will be discussed more in the next

section. Second, the two teams that rated themselves the lowest on items measuring self-awareness (teams three and four) were the only teams that exhibited any evidence of pedagogical reflection. This was inconsistent with observation and interview data. All four teams received neutral scores under self-awareness, which measures components of critical reflection. Broken down even further, the item measuring insights into the moral and ethical consequences of classroom practices received the lowest ratings on all four teams. This is not surprising since other data revealed no evidence of critical reflection on any team.

Key finding one: Pedagogical reflection promotes transformative learning in the areas of content knowledge and pedagogy. When teams engaged in pedagogical reflection, transformative learning related to content knowledge and pedagogy that includes the reframing of an issue was more likely to occur. Reframing is a process of transforming a perception into new understanding or frame (Kasl, Marsick, & Dechant, 1997). Two examples of the reframing of an issue are presented in this section. First, interview data from teachers on team three suggests these teachers reframed their understanding of theme and gained content knowledge related to this subject. Team three's collaborative inquiry goal was to increase critical thinking skills across texts. The team identified the concept of theme as an area of instruction that needed attention pertaining to its goal. As part of its PLC work plan, the team documented plans to investigate the difference between theme, moral, and topic. During teacher interviews, when asked if there was ever a time when the group changed its perspective on something, teacher two and teacher four on team three discussed the team's shift in understanding and new learning about theme:

> **G3, T2:** The first was theme, where I had to keep telling them, "No, theme is not what you're thinking." They just kept thinking topic. After I really researched it, I kept telling

them that's not right but it wasn't until I researched it and got educated about it I could explain that topic is different than theme and I changed their mind. On theme….that is a misconception across education. People are teaching theme as a topic. And I don't know, at third grade, that might be acceptable. But in high school that is not considered acceptable, and that's where you get this question…really, what is acceptable at third grade?

G3, T4: Oh yes, definitely. When we learned about theme, we were like, theme is not that. I looked into that and we learned the difference between topic, lesson, and theme. So when we're teaching the children to write a theme, we're teaching them to not write a lesson….like be good to others so others will be good to you. That's a lesson versus what's a theme. We've learned a lot about theme writing. Identification of what theme was really drove our instruction differently.

Originally, most team members thought "theme" was the same as teaching the "lesson" or "topic." Through pedagogical reflection that examined their past practice and exploration of new information, their perception changed and subsequently altered how they approached teaching theme with their classes.

A second example of transformative learning and the reframing of an issue occurred on team four. This team achieved pedagogical reflection during observation two and also reframed its understanding about the efficacy of its inquiry process. This team reframed an issue when it shifted its work plan from focusing on the development of a lesson as the end product to thinking about it as a process and opportunity for learning. Originally, this team was focusing on planning one lesson that addressed critical thinking skills. Through discussion, the team altered its plan to focus on the integration of strategies across subjects and lessons and gained pedagogical

knowledge. Excerpts from observation two of team four are condensed here to illustrate the moment when the team shifted its discussion and began changing its inquiry work plan:

> **G4, T1: Or is it more about our process? What is our process? What is the goal…to think critically across text?** Were they [students] thinking about it when we started…no. But they are now. And with more exposure and practice it will get better. **Where should we go from here?** I'm thinking about where should I go? **I've been worried about needing to get that lesson done and now I need to start embracing the enjoyment of the process**. We can bring in the masks [part of original lesson plan]…
>
> **G4, T2:** That is what we're doing. Maybe it works, maybe it doesn't. I'm hearing what you're saying. **It sounds like we got caught worrying about the product**. [To teacher four] I want to hear your thought. We're using this as the conduit. Our analysis, but kids are not engaged if we look back at our goal…
>
> **G4, T1:** Okay, maybe it shouldn't stop. Maybe the *start* should be implement the energy lesson. Enough talking about it, and let's do it! I'll tie it to science since we are getting ready to start our rocks and minerals. [Emphasis mine throughout.]

Transformative learning related to content knowledge was supported through reflection of past practices on team three. Similarly, transformative learning about pedagogy was a learning outcome achieved by team four as a result of its reflective dialogue. Through pedagogical reflection that examined prior practice, teams three and four both reframed how they thought about an issue and gained new knowledge.

Key finding two: Pedagogical reflection promotes changes to practice. Teams that reached levels of pedagogical reflection experienced new learning about pedagogy, which prompted changes to their instructional practices. Data collected from teams three and four

identify areas where changes to practice were implemented. First, interview data collected from teacher three on team four supports the claim that pedagogical reflection can lead to transformative learning and changes to practice. This teacher demonstrated self-awareness and described how his transformation led to changes in how he facilitated classroom discussions with his students. When asked about what he had learned about himself, his students, and his teaching practice during the inquiry process, he responded:

> **G3, T3:** I'm not the best collaborator in the world. My whole way of doing things doesn't serve me as well. I'm learning about being a better collaborator…I've learned that when they [students] are engaged deeply in what they are reading…everything flows from there. If they are reading bland topics, they don't ask questions, they don't dig deep. I used to think I had to give them the questions. I had a hard time releasing control, but I've learned that they can dig deep with the right material. The engagement piece is everything, which I've learned…I always considered myself a reflective teacher, but it helped me feel less exposed because often in reflection, you reflect what you want others to see. I'm learning to not fear that side. In order to be authentic, it's being less controlling of the image and being able to say, I'm stuck. That's when the growth happens.

One of his teammates also commented on teacher three's transformation during her interview when asked about a time when someone in the group changed perspectives:

> **G4, T1:** I would say probably earlier in the process when we started digging into the questioning. Teacher three [name removed] felt like he always needed to generate the questions and he had a hard time with that, but then through this process, after hearing

what others were doing he started feeling like he could trust the kids to start generating their own questions. That is the one that stands out to me the most.

Through the collaborative inquiry process, teacher three developed an increased awareness of the consequences of his past practice through reflection and reframed his perception about how to promote critical thinking during student discussions. Transformative learning is a process that changes one's beliefs and taken-for-granted assumptions. Teacher three's original belief was that students wouldn't be able to generate questions that promoted critical thinking. Through reflection that included an examination of his past practices, he reframed what he believed about student-directed questioning and made changes to how he taught.

In the previous section, interview data related to team three's new learning about theme was discussed. Given their new understanding of theme, team three used this information to plan for changes to instructional practice:

G3, T3: I asked the kids to use evidence from the plot to support their choice of theme. If they are asked to use the evidence, that will eventually help them scaffold the theme.

G3, T2: Mine aren't doing that second part. I need them to hear their opinion and have an "ah ha" moment of understanding of another perspective. I'm not seeing anyone get excited and see that.

G3, T4: At least you could have other students generating themes.

G3, T3: This makes me think of talking about big ideas.

G3, T4: What was your idea? Didn't you teach them to learn to agree to disagree?

G3, T3: So the prompts we've been using in small group discussions, like when they identify a theme, "I agree because" or "in addition…"

> **G3, T1:** Maybe we could divide kids into three groups. We could have a moral group, theme group, and topic group. They could get together in clusters and give points about why this is the theme. We could make a game out of it. It would prompt them to have dialogue and see the difference between them. Or we could have three groups and they all focus on theme.

Prior reflections on teaching theme and this discussion during observation one led to the generation of a joint lesson plan that was later collected as artifact data. The planned lesson incorporated multiple changes to how this team had previously taught theme which included genre of text used (fables) and explicit instruction and related activities emphasizing the differences between moral, topic, and theme. Overall, evidence collected from teachers on teams three and four suggests that when teachers examine the efficacy of past experiences and practices through pedagogical reflection, they are more likely to make changes to their teaching practices.

Key finding three: Technical reflection limited teacher learning and instructional outcomes. Teams one and two were consistently observed engaging in dialogue that was non-reflective or at the technical level of reflection which had consequences for teacher learning and the instructional outcomes that followed. While technical reflection limited content knowledge and pedagogical knowledge, it appeared to cultivate knowledge of students. Both teams at Lyndale reported the importance of using student learning data during their collaborative inquiry process and this helped them achieve knowledge related to students. Survey data from team one and team two suggest that they acquired increased knowledge of students compared with teams at Deerbrook (see Table 23). However, when pedagogical reflection was absent, it had consequences for the teacher learning and instructional outcomes. The result was teacher learning that focused on knowledge of students and instructional outcomes that focused on

regrouping students and identifying instructional interventions. Team one's planning involved making changes to student groupings and assignments to intervention teachers but did not emphasize changes to teacher practices. This exchange from observation three of team one demonstrates how the team explored a student's specific learning weaknesses, and then planned for an intervention teacher to work with the student without reflecting on prior teacher practices:

> **G1, T4:** I know there is a focus issue too, so he's going to start getting speech services but he struggles with reading and writing too. Like opinion writing especially, and I know it's not like totally uncommon…but I don't know, he just really stands out to me…and I'm not exactly sure what that is…
>
> **G1, T1:** So you're wondering if the intervention teacher [name removed] could do some one on one with him…but what would that be?
>
> **G1, T4:** I don't even know what that would be? I wish somebody else could work with him and see.
>
> **G1, T2:** Does the intervention teacher work with him now?
>
> **G1, T4:** No, we don't even meet until next week…not sure if she'll start right away or how that works. Is the intervention teacher trained in Write Tools?
>
> **G1, T1:** I don't know…
>
> **G1, T3:** Is there a program for sentence building? What's the number one concern?

Planning for future instruction without considering the efficacy of past practice limits teacher learning. The example above highlights how this team gained knowledge of students and used it for future planning of student groups and intervention assignments. However, the team did not reflect or explore how the classroom teacher's instruction influenced this student's learning

outcomes. This limited the opportunity to gain content or pedagogical knowledge and consider the need to make changes to classroom instructional practices.

Non-reflective and technical levels of reflection also undermined the opportunity to make changes to teacher practices that could be linked to social, ethical, or political consequences. A lack of critical reflection inhibits teacher awareness of personal values, beliefs, and biases and also leads to a lack of consideration for the social or moral implications of classroom practices. An example of this was evidenced with team one. During the second observation, the concept of what's "fair" was considered in regards to the pairing of a student who was struggling (presumably a student with a learning disability) with a more abled student. The consideration of "fairness" was only considered from the perspective of what would be fair to the other students. In other words, the question "Is it fair to pair her with someone?" suggested that the brighter student's learning would be limited because of being paired with a peer with learning difficulties. This implies that the struggling student has little to offer in the partnership. There was a lack of awareness about this assumption or personal bias, which led to discussion and instructional decisions that could be considered inequitable:

> **G1, T2:** Student one [name removed] won't be able to research on her own…we'll have to problem solve that.
>
> **G1, T1:** Is it fair to pair her with someone? Maybe you could give a choice? You could ask her if she wants to be on her own or with a partner?
>
> **G1, T2:** I'd have to be careful with that.
>
> **G1, T1:** It's much more choice driven.
>
> **G1, T2:** She won't be able to do this during her intervention.
>
> **G1, T4:** Same with student two [name removed].

G1, T1: Maybe we can do something leveled. You can talk to her about how cool this bug is…or maybe butterflies…

G1, T4: Yeah, spin it. Give them butterflies and tell them they're the only ones who get to see the insect. Student two might not like that…oh well, too bad.

The outcome of this discussion was to pair up students one and two (both struggling students) to research butterflies so they could work on the project together with a teacher during their intervention block. Again, this team did not explore changes to its own teaching and instead placed these two struggling students together to have the intervention teacher work on the project with them. A few statements from the related discussion could be considered inequitable and have social or moral implications. First, the rest of the students had the opportunity to choose any insect they wanted to research, while students one and two did not get a choice and were assigned butterflies based on the availability of leveled books and materials. Teacher four suggested "spinning" the assignment of butterflies to make the assignment more desirable while admitting that student two will likely not be interested in researching butterflies. Second, other students were paired together based on interest in an insect. These two students were paired together based on ability level. Team one had good intentions of supporting the struggling students in the completion of a successful project. However, the question "Is it fair?" could have been extended as the team planned for the differentiation of the insect research project for the two struggling students. Had this conversation reached a critical level of reflection, the team might have considered the social and moral implications of this outcome and questioned the fairness of denying the students the same topic choices as their classroom peers and also denying the struggling students the opportunity to work with other peers. Further, they also might have examined their personal biases and assumptions, i.e. that the students with learning difficulties

might have little to contribute to the group, thus limiting their partners' learning. Technical reflection limits the opportunity for teacher learning and changes to practice. Reflection that does not consider the social, moral, and ethical consequences of actions has implications for teaching practices that are worth further consideration.

Summary. My findings related to research question three and the impact of reflection on teacher learning and instructional outcomes reveal the importance of engaging in reflection that considers the efficacy of past practice. When teams engaged in pedagogical reflection, teachers experienced transformative learning and gained content and pedagogical knowledge. Pedagogical reflection that led to transformative learning also led to changes in teachers' practices. Conversely, technical reflection limited teacher learning and instructional outcomes, but promoted knowledge of students. The knowledge of students was used for planning that emphasized student groupings and interventions. Overall, collaborative inquiry processes at Deerbrook tended to encourage teacher learning about content and pedagogy while collaborative inquiry processes at Lyndale encouraged teacher knowledge of students. These differences in how collaborative inquiry processes oriented teacher learning impacted instructional outcomes. Additionally, non-reflective and technical levels of reflection limited the opportunity for teachers to learn from and make changes to teacher practices that could be linked to social, ethical, or political consequences.

Chapter Six: Discussion and Implications

The purpose of this chapter is to summarize study findings and present implications. This chapter begins a discussion of empirical findings and how they relate to what we know from existing literature. This is followed by limitations of the study and a discussion of the implications of this study for principals, teachers, and future researchers. Last, a summary of the study conclusions ends the chapter.

Discussion of Findings

Findings from this study both support and extend prior research. My findings are consistent with earlier studies that have suggested that critical reflection is rare and underutilized by teacher teams (Hagevik, Aydeniz, & Rowell, 2012; Orland-Barak, 2007; Sung, Chang, Yu, & Chang, 2009). For the teachers in this study, looking back on prior instructional practices with a critical lens was not something that happened naturally and only occurred on teams where specific routines and tools were in place in order to prompt consideration of past practices during components of the inquiry process. Attempting to characterize levels of reflection proved challenging, but reflection can be an avenue for professional growth and continuous learning from experience. Teacher's reflective abilities can develop over time and measuring reflection can be helpful in understanding and developing teachers' reflective capacities (Kayapinar & Erkus, 2009). As such, making sense of different levels of teacher reflection is worth more consideration and investigation. My findings suggest that while reflection is difficult to quantify, how components of collaborative teacher inquiry are enacted has consequences for teacher reflection. In particular, I identified five enactment considerations of consequence to reflection: (a) using a visual representation of student achievement data for between-classroom comparison during problem identification and analysis, (b) connecting a student achievement problem to an

instructional problem during problem identification, (c) whether and how teams utilize student learning data throughout the process, (d) teacher engagement in joint lesson planning, and (e) protocol prompts that explicitly ask teachers to consider changes to practice.

Research question one. Although both collaborative teacher inquiry models attended to the same components, the actual enactment of those components varied and this had important consequences for teacher reflection. One notable difference related to whether and how teams utilized student learning data during problem identification and analysis. At Lyndale, student learning data were presented to teachers through a visual display that compared student achievement data across classrooms. This was reported by teachers to promote reflection about prior practices. Conversely, Deerbrook teachers relied on anecdotal evidence during analysis and did not compare student learning data across classrooms during problem identification. This limited reflection, as teachers did not have objective evidence to consider when drawing conclusions.

Also of consequence during problem identification was how teams selected a problem to address as a team. Deerbrook teachers identified a student learning problem and tied it back to an instructional problem that warranted changes to practice. The link between student learning and instruction promoted reflection on prior practices. Lyndale's collaborative inquiry process focused on identifying a student learning problem and considered students' strengths and weaknesses, but didn't connect it to an instructional problem. These differences in how the schools identified a problem for investigation had consequences for reflection. Lyndale's collaborative inquiry model and guiding questions oriented teachers toward instructional planning and action where prior instruction and its efficacy were never considered as sources of planning information. As a result, teams at Lyndale never reached levels of pedagogical

reflection during observations and were focused on planning, sharing resources, and grouping students for intervention while never considering the efficacy of their own prior practices. Prior literature has pointed to the importance of collaborative inquiry teams shifting their focus from sharing activities and resources to raising questions about their instructional practices (Nelson et al., 2012). My research extends this finding and suggests that the shifts Nelson et al. (2012) see as productive will likely necessitate careful consideration of how collaborative inquiry models are enacted. My own findings offer guidance for the kinds of questions that teachers should be asking during collaborative inquiry, which may promote pedagogical reflection about teacher practices.

Deerbrook's collaborative inquiry model oriented its teachers toward action and teacher learning of content and pedagogy by building in opportunities for reflection that evoked consideration of *why* problems were occurring. Further, grade level goals had to include a teacher strategy that incorporated changes to current practices. However, these teachers did not focus their inquiry work on the achievement of a measurable student achievement goal, nor did they utilize student learning data throughout their process or to analyze progress toward their goals, which limited their knowledge of students. Previous research has suggested collaborative inquiry teams that focus on improving student learning outcomes through the use of data are more likely to improve instruction (Clauset & Murphy, 2012; Levine & Marcus, 2010; Talbert, 2010). Saunders, Goldenberg, and Gallimore (2009) recognized the importance of building teacher knowledge, but also suggested that teacher groups focused on increasing knowledge without the direct application to student learning might have a weaker effect on achievement. My study did not look at student achievement, but I did find that teacher reflection and learning were

limited when teachers did not utilize objective evidence to support their conclusions and guide future planning.

The use of student learning data and evidence-based decision making is advocated for by many scholars (Clauset & Murphy, 2012; Levine & Marcus, 2010; Talbert, 2010). However, the ways in which teams in this study used student learning data often compromised the opportunity for reflection and teacher learning. Lyndale utilized student learning data to inform instructional planning and student groupings by considering what to teach and to whom, but did not reflect on how their teaching influenced student achievement during observations. The exception to this observation relates to Lyndale's use of the data wall and the visual representation of data. According to teacher reports, this practice did encourage reflection of past practices even though these teachers were not observed considering the efficacy of past practices to inform their planning. Prior research has noted the difficulty in using student learning data in a way that promotes teacher learning and informs classroom practices (Cosner, 2011; Nelson et al., 2012). My findings support earlier conclusions and suggest that when teachers use data for future planning without considering the efficacy of prior practices, teacher learning and the potential for future changes to practice are limited. My study extends earlier research and offers suggestions for how to present student learning data to teachers in ways that may promote reflection and teacher learning.

My findings suggest that joint lesson planning created an opportunity for teachers to make their practice public as one lesson was made visible for all to consider. When Deerbrook teachers reflected on their joint lesson plans, reflection was encouraged as they made their practices visible to others in the group. Observational data across teams revealed that making practice public was not the norm and teacher teams rarely moved beyond congenial

conversations to challenge existing practices. This confirms what other scholars have suggested in that educators often feel uncomfortable promoting the transparency of their practice and making it visible and open to scrutiny (Earl & Katz, 2010). Similarly, Timperley and Earl (2009) found that one of the prevailing concerns among teachers discussing evidence during inquiry was to reduce threat and ensure comfort rather than to increase learning. My research supports earlier research and extends it by offering specific enactment suggestions (joint lesson planning) as a means of promoting reflection. Because making practice public creates vulnerabilities, joint lesson planning may be a way to introduce the routine of making practice public with teams who have little experience with it as it likely creates less vulnerability because the scrutiny on instruction is about a team lesson rather than an individual lesson. Studies that have examined the effects of lesson study, which is similar to joint lesson planning, suggest that in order for teachers to benefit from lesson study they need to be able to apply a critical lens when examining their practices (Fernandez, Cannon, & Chokshi, 2003). My study builds on earlier findings by offering suggestions for incorporating routines and questions that invite critical analysis of practices when reflecting on joint lesson plans.

In comparing the protocols used at each of the schools, I noted important differences that shifted each team's plan and focused discussion on reflection on past practices. Specifically, Deerbrook's protocols explicitly prompted teachers to identify teaching practices that needed attention, hypothesize why the problem was occurring, and develop a teacher strategy to address the instructional problem. Further, Deerbrook protocols prompted teachers to reflect on how their practices had changed as a result of their inquiry work. Lyndale's protocols framed discussions around student learning problems and encouraged the identification of student strengths and weaknesses for the purpose of forming student intervention groups. Protocols used at both

schools were insufficient for promoting critical reflection within the collaborative inquiry process. Little and Curry (2008) suggested that protocols can be both promoting and limiting depending on how they are designed and used. My findings support this argument as certain features of protocol design were found to promote pedagogical reflection while also inhibiting the opportunity for critical reflection. Observations of teams three and four provided evidence that critical reflection emerged outside of collaborative inquiry but that the collaborative inquiry process may have constrained the opportunity for continued critical discussions. Teachers at both schools reflected and operated within the parameters of how the collaborative inquiry process was framed for them. Lyndale's protocols emphasized student achievement and Deerbrook's protocols tended to emphasize changes to instruction. Neither process encouraged consideration of critical issues, and by adhering strictly to the framework and protocols provided, the opportunity to engage in critical reflection was limited for these teachers. Prior research supports the use of structured protocols during collaborative inquiry (Cosner, 2012; Gallimore et al., 2009; Levine & Marcus, 2009; Nelson, 2008; Little et al., 2003), but little has been suggested in terms of how to design such protocols for advancing reflective or critically reflective dialogue. Findings from this study support the use of structured protocols and provide guidance and considerations for those planning and implementing collaborative teacher inquiry.

Whether and how administrators frame issues to address within collaborative inquiry matters to reflection. How the process is framed influences teachers' perceptions and how choices and priorities are made. If administrators place high value and emphasis on student achievement data, it is likely that teachers will make choices that influence student achievement. During principal interviews, both principals provided evidence of how the collaborative inquiry process was framed in their schools. The principal at Deerbrook stated that his goal was "to

develop a culture of learning and an environment where if you want student achievement you have to strengthen the teacher learning culture." The principal at Lyndale highlighted how the school's collaborative inquiry work led to increased student achievement scores and emphasized the goal of teachers being "engaged in collaboration around student learning and instruction." National initiatives often emphasize accountability for student achievement, so it is not surprising that principals framed their collaborative inquiry process largely around student achievement. However, the principals may have overlooked a critical perspective in their consideration and design of these processes.

The school demographics may have shaped how principals thought about collaborative inquiry work. In both settings of this study, the teachers and students were of a particular demographic, which was primarily white with a disproportionately small ratio of low-income students. It is important to consider why teachers were consistently not engaging in critical reflection and to question whether this could be a broader professional issue related to how teachers are prepared and socialized. Research suggests that urban teacher education programs are addressing critical issues (Berghoff et al., 2011). However, findings from this study support the need for preparing all teachers to reflect critically, not just teachers attending urban education programs or teaching in urban schools. Both schools in this study were situated in a north suburban district of a specific demographic. The absence of critical reflection within suburban districts such as these may have broader consequences, including the perpetuation of social inequalities. Moreover, many suburban school systems are seeing rapid changes to their demographics and will have the responsibility of educating increasingly diverse student populations (Evans, 2007). Considering this, it is important for teachers and educational leaders to be prepared to serve a diverse and changing student population.

Research question two. Study findings suggest that certain conversational routines support or limit reflection on collaborative inquiry teams. Observational data revealed three conversational routines that influenced reflection: (a) revising questions promoted reflection, (b) discussions that focused problems of practice on students or external factors turned conversations away from instruction and limited the opportunity for reflection, and (c) normalizing a problem of practice without asking revising questions was found to limit reflection. Horn and Little (2010) previously identified four conversational routines that influenced teacher learning. My findings support and build on this earlier work as my study differs by examining teacher talk through the lens of reflection. I found that two of the routines identified by Horn and Little (2010) influenced reflection: revising and normalizing. Similar to their study, I found that how a speaker framed a problem was consequential to the dialogue that followed. When teachers framed problems as student problems or blamed problems on external factors, conversation turned away from instruction and limited the opportunity for reflection. Conversely, when teams asked revising questions, this elicited analysis and transitioned the conversation to focused reflection on the problem. Horn and Little (2010) found normalizing statements to be influential in either turning conversations away from or toward teachers. My findings confirm that normalizing statements by themselves can close off the opportunity for reflection. However, when normalizing statements were followed with revising questions, reflection was promoted.

Existing research has previously established the importance of trust for collaborative inquiry teams (Cosner, 2012; Little, 1982; Timperley, Annan, & Robinson, 2009). My findings support what existing research has said about the importance of trust. Teams in this study that scored higher on the survey measuring individual expression, which considered the extent to which team members felt their input was valued and felt free to express negative feelings openly,

also more consistently reached higher levels of reflection. This supports literature that highlights trust as an antecedent to promoting reflective dialogue that is more collegial in nature (Cosner, 2012). Teachers that were able to expose their personal weaknesses and open discussions up for feedback were more likely to reach levels of pedagogical reflection.

Research question three. Differences in collaborative inquiry models influenced reflection and generated different types of knowledge that subsequently impacted teacher learning and instructional outcomes. Findings suggest that reflection influenced teacher learning and instructional outcomes in three ways: (a) pedagogical reflection promoted transformative learning related to content and pedagogy, (b) pedagogical reflection promoted changes to instructional practices, and (c) technical reflection limited opportunities for teacher learning and changes to practice with a focus on students that did not extend to instruction.

My study supports what others have found and suggests that teacher learning through pedagogical reflection encourages changes to instruction. Earlier scholars have identified teacher learning as a primary antecedent to improved teaching (Borko, 2004; Cochran-Smith & Lytle, 2009; Darling-Hammond & McLaughlin, 1995; Little, 2001; Timperley & Phillips, 2003). I found that teams at Deerbrook experienced transformative learning and gained knowledge in the areas of pedagogy and content, but failed to increase knowledge of students. Alternatively, teams at Lyndale were observed and reported increasing their knowledge of students. Teachers at both schools increased knowledge, but the areas of knowledge as well as instructional outcomes differed. Deerbrook gained knowledge of content and pedagogy and made changes to how teachers taught. However, its collaborative inquiry process limited the types of knowledge acquired as teachers did not gain sufficient knowledge of students. Lyndale teachers gained knowledge of students, but tended to focus on student groupings and intervention supports. This

was problematic because instructional planning without gaining knowledge of content and pedagogy limited the opportunity for changes to practice. Given that all three forms of knowledge can be useful for instructional planning (Borko, 2004; Timperley & Parr, 2007), I have learned that enactment of collaborative teacher inquiry components provided differential support for reflection and generating types of knowledge.

Limitations of the Study

There were three main limitations that should be made known when considering these findings. The first limitation was that I was not able to directly observe each component of the five focal components of collaborative inquiry, and instead relied heavily on interview and artifact data, particularly for the components of problem identification and developing a shared vision. Since my findings had implications for how teams identified a problem, my claims would be more credible if I had observational data that supported other data. Second, I relied on teacher interviews and artifact data related to my finding about the visual representation of data across classrooms. I found the teacher reports credible because almost every teacher on those teams reported this to be a factor that promoted reflection. However, observing teachers utilizing the data wall would have provided a better understanding of how this practice influenced teacher talk and reflection. It is possible that the reflection occurred after the team meeting and was not made visible to others for the benefit of the group. These limitations can be considered in order to prevent methodological limitations for future studies. The third limitation related to the difficulty in quantifying and determining reflection levels achieved by teams. Using the Reflection Observation Rubric and considering the definitions of the four levels of reflection assisted me in making these distinctions: however, measuring the act of reflection with accuracy was impractical at times.

Implications of the Study

Findings from my study have implications for school leaders, teachers, and future researchers. Building leaders often have a large role in designing, planning, and facilitating learning opportunities for teachers. As such, principals need to be informed about how the enactment of collaborative inquiry components and conversational routines of teachers influence reflection and teacher learning as they design collaborative inquiry learning experiences. Likewise, since teachers are the participants engaging in the process, increasing their understanding of how to maximize learning for improved instruction through reflection is paramount. More empirical research is needed in the area of critical reflection within collaborative teacher inquiry. These findings, along with what was not addressed in this study, have implications for future research.

Principals. These study findings have implications for principals to design collaborative learning experiences that offer more systematic support for teacher reflection. Those responsible for selecting and encouraging collaborative inquiry models in schools will need to think beyond the adoption of a particular process, but should also think carefully about how collaborative inquiry components are enacted if reflection and critical reflection are to be encouraged. Principals must recognize that how collaborative teacher inquiry is enacted has important consequences for the types of knowledge generated and the instructional outcomes that follow. My findings offer specific guidance for those planning to implement collaborative inquiry regarding the development of protocols that should be utilized during each component of the process. First, during problem identification, it is important that teachers are provided with tools that offer guiding questions focusing their attention on a student achievement problem as well as the instructional factors that need attention. There would likely be benefit to the use of tools that

explicitly direct teachers to consider instructional practices that may have contributed to the student learning problem. Second, when developing a shared vision, it is important that teams are asked to set a student achievement goal in addition to identifying teaching strategies that will help them achieve that goal. My findings suggest that data often prompt consideration of future planning, without the consideration of past practices. Since teachers do not naturally look at how their teaching may have influenced student achievement, structured questions and protocols need to be provided to assist this process. Additionally, teams need to have access to student learning data across classrooms when teams are evaluating their progress toward their shared goals. As discussed under implications for teachers, principals need to support the development of teacher routines that make their practice public and foster discussions that evaluate the efficacy of certain practices. Last, principals need to incorporate questions into their protocols that elicit consideration of the social, ethical, and political consequences of teachers' actions. As my findings and other research suggests, critical reflection does not occur naturally.

While systematic supports are recommended, principals must also carefully consider how these supports may constrain opportunities for critical reflection if not attended to and promoted both as part of the school culture and within collaborative inquiry in order to carry over into classroom teaching experiences. Critical issues should not be addressed merely through a prompt on a protocol during one facet of school life, but instead should be immersed and discussed through school-wide efforts as a means of promoting awareness and action. Critical issues are present in all demographics; however, if teachers and students are not directly impacted by socio-cultural prejudices, their lack of awareness and attention to these issues may unintentionally perpetuate and contribute to inequitable societal norms. As such, it is especially

important for school leaders to expand efforts to increase awareness and action related to critical issues across the school, the broader school community, and on collaborative inquiry teams.

Teachers. Teachers engaging in collaborative teacher inquiry should consider four important factors that will influence their reflective capacity and learning. First, teachers need practice and experience making their practice public. Collaborative inquiry teams need to develop structures where making practice public is part of their routine and where individual instruction is made visible and open for feedback. One way this can be achieved is through joint lesson planning where teams reflect together after lessons, considering differences in instruction and the efficacy of individual practices. Trust is a condition that would support this practice. The development of shared norms and values that address non-judgmental or defensive approaches to giving and receiving feedback may support building trust and sharing individual practices. Second, using student data and making student learning visible across classrooms are important but not enough to encourage pedagogical learning. Looking at data across a grade level must also be followed with conversations about how teachers are instructing their students. If student achievement in one classroom shows gaps or weaknesses, and another class shows high levels of achievement, teachers need to compare instructional practices. They need to ask questions that examine each other's practices so that they can learn and draw informed conclusions about what works and what does not. Third, teachers need to be aware of how conversational routines influence the team's ability to reflect on past practice. Of importance is how teachers frame a problem when reflecting on an instructional experience. If a teacher in the group is turning a conversation away from teaching, others in the group need to turn the conversation back through the use of revising questions. Teachers and teacher leaders engaging in collaborative inquiry would benefit from facilitator training in how to refocus conversations and offer or encourage

feedback that is productive. Teacher dialogue that considers the efficacy of past practice supports transformative learning and knowledge about pedagogy that will lead to instructional changes. Last, it is important for teachers to increase the capacity to reflect critically and carry this over into their collaborative inquiry work. Whether in a school where critical issues are obvious or where teachers have to look deeper, questioning current practices and creating an awareness of how one's teaching actions can perpetuate certain socio-cultural norms are necessary activities in a school system that promotes the development of responsible citizens.

Future research. I offer three recommendations for future related research. First, it would be beneficial to study teams that engaged in critical reflection during collaborative teacher inquiry. Since critical reflection has been found to be so rare, it would be useful for researchers to consider issues and limitations of how the collaborative inquiry process may prevent critical discussions from happening and explore how critical reflection can be fostered within that setting. Second, this study did not address how teacher reflection within collaborative teacher inquiry impacts student achievement outcomes. In some ways, the collaborative inquiry process constrained teachers to operate within the parameters of a particular framework. It is important to consider what may lead to the shaping of these frameworks, including the emphasis and value that state and national mandates have placed on student achievement. There is no question that student achievement is important, but also worth exploring is how attention to critical issues can influence student achievement. Future research that considers the influence on student learning is needed to better understand the value of promoting reflection and critical reflection within collaborative teacher inquiry. Last, the lack of emphasis on critical reflection within collaborative inquiry suggests implications for future research on the factors that may be influencing critical reflection within the profession of education. For example, there may be a

need for research to better understand whether or how teachers are prepared and socialized for reflection and critical reflection. An exploration of how teacher preparation programs and state and national initiatives and mandates promote or distract from critical issues are worth further examination.

Conclusion

Collaborative teacher inquiry as a professional learning model has the potential to influence teacher learning and instructional outcomes. Variations in how collaborative inquiry models orient teachers toward learning and instruction matter to reflection. The findings from this study demonstrate how the enactment of components, including tools used within collaborative inquiry, is of consequence to reflection and influences teacher learning and instructional outcomes. Findings from this study suggest that higher levels of reflection that consider past practice and the social, ethical and political consequences of teaching actions are rare and need to be supported systemically. These findings, paired with what we know from existing research, suggest that reflection influences teacher learning and subsequent instructional outcomes.

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APPENDIX A

Interview Protocol

Teacher Interview

1.) Describe the process your team has gone through.

2.) What avenues of reflection have you found the most useful/beneficial?

3.) What avenues of reflection promoted reflective conversations among your team?

4.) Has there been a time within your group discussions when you or someone else on your team has changed their perspective about something? If so, what happened?

5.) As a result of participating in this process, what, if anything have you learned about:

your teaching practice? (probe…have you tried anything new? Changes to practice?)

working with your students?

Yourself?

6.) How has this process influenced professional reflectiveness, if at all?

7.) As a member of this team, how might this process become more valuable for you and your colleagues?

Principal Interview

1.) Can you tell me about the history of these inquiry groups? How did this process get established and how/when did the inquiry routines emerge?

2.) What are the overall goals/hopes for teachers? Students? Anything else?

3.) What challenges have you or your teachers encountered related to this process?

4.) What are some of the outcomes you've seen as a result of teachers engaging in this process?

a) outcomes for teachers

b) outcomes for students

c) anything else?

APPENDIX B

Reflection Observation Rubric

Reflection Levels Criterion	Non-reflective	Technical	Pedagogical	Critical	Notes
spectrum	•Superficial descriptive approach (fact reporting, vague impressions) without reflection or introspection	•Elaborated description of events and impressions without reflection •Focused on teaching functions, actions or skills, generally considering teaching episodes as isolated events	•Movement beyond reporting or descriptions to reflecting (i.e., attempting to understand, question, or analyze the event) •	•Exploration and critique of assumptions, values, beliefs, and/or biases, and the consequences of action (present and future)	
Presence	•Sense of individual/s not being present	•Sense of individual/s being partially present	•Sense of individual/s being largely or fully present	•Sense of individual/s being fully present	
Description of conflict or disorienting dilemma	•No description of the disorienting dilemma, conflict, challenge, or issue of concern	•Absent or weak description of the disorienting dilemma, conflict, challenge, or issue of concern	•Description of the disorienting dilemma, conflict, challenge, or issue of concern •-teachers pay attention to the environment and effect on teaching practices	•Full description of the disorienting dilemma, conflict, challenge, or issue of concern that includes multiple perspectives, exploring alternative explanations, and challenging assumptions	
Attending to emotions	•Little or no recognition or attention to emotions	•Recognition but no exploration or attention to emotions	•Recognition, exploration, and attention to emotions	•Recognition, exploration, attention to emotions, and gain of emotional insight	
Critical Analysis and meaning making • interpretation of student learning • connections with instruction • Implications for future teaching	**No analysis or meaning making.** •Reactive, responding to situations automatically without conscious consideration of alternative actions • No evidence or reasons provided to support conclusions about student learning • Provides no ideas or inappropriate ideas for future learning goals	**Little or unclear analysis or meaning making** •Focused on strategies that help them reach pre-determined goals without considering the value of goals themselves •Provides evidence but no reasons or hypothesis to support conclusions about student learning •Makes connections between learning and instruction, but misunderstanding and gaps •are present • Provides ideas for redesigning learning goals, instruction and assessment but offers no rationale	**Some analysis and meaning making** •Seek to understand theoretical basis for prior classroom practices and align theory with future practice •Uses evidence to support conclusions, exploring multiple hypothesis for why some students did not meet learning goals including an exploration of past practices. •Logically connects learning goals, instruction and assessment results • provides ideas for redesigning learning goals, instruction and assessment and explains what the impact will be on student learning	**Comprehensive analysis and meaning making** •deep examination of values and beliefs, exposing biases •reflecting on the social, moral and political implications and consequences of classroom practices •provides ideas for redesigning learning goals, instruction and assessment explaining the impact on social conditions and student learning	

APPENDIX C

Team Learning Survey

Part 1

Directions: using the scale below, determine the extent to which you agree with each statement. Think about each statement in terms of your present experience with your team. Record all your responses on the Response Form.

Rating Scale

FA = Firmly Agree

MA= Moderately Agree

SA= Slightly Agree

N= Neither Agree nor Disagree

SD= Slightly Disagree

MD= Moderately Disagree

FD= Firmly Disagree

In our work team…

1. the end products or our work include performance improvements.

2. members share the results of their personal insights or learning with one another.

3. we often learn through trying out new behaviors.

4. we build upon one another's ideas.

5. members do *not* have the opportunity to define and develop the team's objectives.

6. we find that we need to balance getting the task accomplished with building relationships among members.

7. the end products of our work include new approaches to work.

8. we learned to drop our departmental perspectives and think from a school-wide perspective.

9. we change our perspectives about ourselves and others.

10. we try to understand one another's viewpoints.

11. speaking one's mind is *not* valued.

12. members take sufficient time to get to know each other before working on the task.

13. the end products of our work include new ways of thinking.

14. we often revise our viewpoints based on input or new information from others outside the team.

15. members try out new approaches to their jobs as a result of the team's work.

16. most members are open to new ideas or ways of thinking.

17. people do *not* feel free to express their negative feelings about changes.

18. we are developing beliefs, values, and guiding principles.

19. the end products of our work include new social norms.

20. the act of working collaboratively results in greater learning for each of us than if we had worked alone.

21. we generally incorporate the perspectives of most members in analyzing problems and making decisions.

22. we look at issues from multiple perspectives.

23. we spend much time gaining clarity around our purpose and structure.

24. the end products of our work include new ways of managing.

25. we often find that our views of the problem changes as a result of our team discussion.

26. we invite people from outside the team to present information or have discussions with us.

27. team effort is valued over individual achievement.

28. we discuss our feelings as well as our thoughts.

29. the end products of our work are of much higher quality than any one of us could have produced alone.

30. we listen to the perspective of every member in the team.

31. we generally revise our viewpoints based on input or new information from others outside our team.

32. most members are able to express their thoughts clearly.

33. the end products of our work include new work processes or procedures.

34. members change their behavior as a result of seeing other team members change.

35. we share what we learn from our team with others outside the team.

36. we try to capitalize on each other's strengths and compensate for one another's weaknesses.

37. we challenge our basic beliefs or assumptions about the issues under discussion.

38. we increase our knowledge base by going outside of our team for information.

39. members feel valued and appreciated by one another.

Part 2

Directions: Think about the following statements in terms of your present experience with your school or district. Use the rating scale from Part 1 and record all your responses on the response form.

40. we have made significant progress over the past year towards becoming a "learning

community."

41. facilitators are adept at motivating and directing the energies of our collaborative teams.

42. people who help others learn how they can be more effective in their jobs are *not* rewarded by the school or district for their efforts.

43. the establishment of collaborative inquiry teams has helped the school district adapt and change.

44. individuals have sufficient freedom to make decisions critical to success.

45. administration does *not* serve as a model for new ways of working together with people from other buildings or departments in the district.

46. there are systems in place for conveying the findings from collaborative inquiry teams to the right people throughout the district.

47. administrators generally support ideas and recommendation of their collaborative inquiry teams.

48. people are not encouraged to help one another across departments or schools.

49. collaborative inquiry teams are used successfully as mechanisms for transferring ideas up the line and across the district.

50. continuous learning for performance improvement is valued.

51. leadership "practices what it preaches" when encouraging new ways of working or managing.

52. there are many obstacles to working together with people from other departments or buildings.

53. team efforts are supported along with the ideas and recommendations of work teams.

54. involvement in collaborative inquiry teams is not rewarded.

55. collaborative inquiry teams and the like have been responsible for many school or district-

wide changes.

56. leadership generally supports the ideas and recommendations of collaborative inquiry teams.

57. people who help others learn are highly valued.

58. we have become much more innovative in our instructional practices over the past year.

59. teachers can challenge school and district leaders without being punished.

60. we are becoming more effective at anticipating and adapting as a school or district to environmental change.

Part 3

Directions: Rate the extent to which you feel you have benefited by participating on an inquiry team.

Rating scale: 1 (not at all) to 5 (a great deal)

To what extent have you gained:

61.) Research-based knowledge about teaching and learning?

62.) Insights about how to reach certain students?

63.) Insights into the moral and ethical consequences of your classroom practices?

64.) Ideas for increasing your teaching expertise?

65.) Perspectives on your strengths and difficulties?

66.) Increased self-awareness of your personal values, beliefs and biases?

67.) Greater understanding of ways to monitor results of teaching strategies and make adjustments?

68.) Greater confidence in experimenting with a range of instructional methods?

69.) A stronger sense of connection with and support from other team members?

70.) A greater sense of yourself as a professional?

Resources

Part One and Two:

Modified from *Team Learning Survey: Facilitator Guide*. Copyright 1991, 1992, 1993 Kathleen Dechant and Victoria Marsick. Organization Design and Development, Inc., King of Prussia, PA.

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Part Three*:*

Modified from: Team to Teach: A Facilitator's Guide to Professional Learning Teams National Staff Development Council www.nsdc.org

APPENDIX D

Type of Action	Definition	Example
Clarifying questions	Facilitator poses factual question group member might need answered in order to understand teacher's proposed inquiry.	"What exactly are the learning objectives for this fraction unit?"
Probing questions	Facilitator poses question that causes teachers to reflect on practice in relation to inquiry.	"What might you learn about your students as a result of exploring this problem?"
Declarative statement	Facilitator expresses his or her own state of mind in relation to what teacher-researcher has just said.	"I know another component many teachers have shared with me related to PARCC test preparation is balancing test preparation, or the teaching of test-taking skills, with other learning experiences."
Reflective statement	Facilitator rephrases something teacher-inquirer has just said, giving it exact and economical sense.	"So what I hear you saying is that you have recently begun using flexible math groups to teach fractions, and all of the students in your class are finding it to be very motivating."
Invitation to elaborate	Facilitator invites teacher-researcher to elaborate on his or her thinking.	"Tell me more."
Deliberate silence	Facilitator deliberately says nothing at all for some time after teacher comments.	Pause a few seconds to create think time.
Humor	Facilitator interjects funny story related to inquiry, makes play on words, or uses some other humorous action to invoke laughter from group.	Linda paints a picture of an inexperienced substitute kindergarten teacher trying desperately to stuff eighteen five-year-olds into mittens, snowsuits, and boots in order to make it to the buses on time.

Table 1. Seven techniques used by facilitators during collaborative inquiry.

Conversational Routine	Definition	Example
Normalizing	Conversations that define problem as normal or expected part of classroom work and teacher experience.	"We've all been there."
Specifying	Questions that explicitly elicit more details.	"How many sentences were they expected to write?"
Revising	Questions that invite analysis and activate crucial transition to focused reflection on problem.	"What do you see in their writing that indicates a problem?"
Generalizing	Conversations that link accounts of practice with general principles of teaching.	"Graphic organizers will help them organize their thoughts."

Table 2. Conversational routines.

Components	Lyndale Elementary	Deerbrook Elementary
Problem identification	• Teams review standardized and formative student data six times per year by class and across grade level to identify student achievement problems. • Data presented visually through data wall. • Teams guided by questions prompting teachers to note students' weaknesses, intervention needs, and students to receive regular intervention • Protocol prompts frame problems as student problems.	• Teams review spring standardized assessment data at beginning of year to identify grade level weaknesses. • Teams consider problem identification questions from work plan template to identify teaching practices that need attention and hypothesize why problems occur. • Work plan template cites research-based principles of Horn and Little (2010), Desimone (2009), and Louis and Kruse (1995). • Protocol prompts frame problems as student and instructional problems.
Developing a shared vision	• Teams use pre-established grade level learning targets aligned with curriculum and determined at district level. • Learning targets describe student mastery criteria by skill (e.g. refer to details in a text, organize events of a story). • Targets serve as achievement goals for each student, class, and grade level. • Vision centered on student learning outcomes.	• Teams develop grade level PLC goal and teacher strategy tied to identified instructional problem. • Teams prompted with, "If my practice changes, then I will see _____ in my students." • Template notes that teacher strategy should bring about practice changes. • Grade level goals not measurable student achievement goals. • Vision centered on improving teacher practices and student learning.
Planning for action	• Planning for action follows analysis of benchmark data six times per year. • Teams meet once per week to plan literacy instruction and discuss student progress toward learning targets. • Teachers document plans through weekly meeting notes that include topic, target focus, outcomes, and questions/clarification for principal. • Team discussions guided by four questions: o What do we want students to know and be able to do? o How will we know when they're there? o What if they are struggling and not reaching it? o What if they already know it?	• Initial long-term plan of action directly follows problem identification and development of shared vision. • Teams meet once per week to plan and reflect on grade level goal and teacher strategy. • Teams document process monthly by indicating topics/goals addressed, resources needed, and timeline for action items completed.

Analysis	• Analysis of progress toward learning targets flows into future planning. • Teams analyze formative assessment data and student progress toward grade level learning targets assessed six times per year. • Analysis tool prompts student considerations as teams are provided the following prompts and asked to review data by grade level and class: o List notable strengths and weaknesses of grade level to keep in mind for instruction (Tier 1) o Describe potential intervention needs (Tier 1) o Identify which students will receive regular intervention support and what type o Other surprises, concerns, celebrations, etc. o Discussion notes	• Analysis of progress toward PLC goal flows into instructional planning. • Teams reflect on PLC process (including teacher and student learning) through exit slips following faculty meetings that occur outside of collaborative inquiry process. • Questions asked of teachers on exit slips include: o What instructional practices may be undermining our work toward building trust and communication? o What instructional practices may be undermining our work toward our PLC goal? • Teams given "Guiding Questions" analysis tool that is completed at end of process and prompts analysis of student learning and instructional practices. Prompts include: o Reflect on how PLC work altered you professionally. o Reflect on how PLC work impacted student achievement. o What went well? o Where were the struggles? o Did your plan shift/change? How? Why? o What needs to happen next?
Making practice public	• Making practice public occurs both inside and outside team. • Inside team, teachers expected to share student work samples and instructional strategies related to learning targets during meetings. • Outside team, teachers participate in five "Show and Shares" per year that publicize learning.	• Making practice public occurs both inside and outside team. • Work planning document prompts teachers to share reflection on lessons and changes to practice. • Teachers participate in mid- and end-of-year expo or "Museum Walk-Through" designed to share learning outside of group. • Teams engage in vertical team sharing once per year.

Table 3. Variability among focal components of collaborative inquiry.

Teacher	Gender	Ethnicity	Years in Current Position	Total Years of Experience
1	Female	White	6	10
2	Female	White	5	12
3	Female	White	5	9
4	Female	White	1	3

Table 4. Case one teacher demographics.

Teacher	Gender	Ethnicity	Years in Current Position	Total Years of Experience
One	Female	White	5	13
Two	Female	White	11	11
Three	Female	Asian	3	20+
For	Female	White	1	7
Five	Female	White	7	7

Table 5. Case two teacher demographics.

Teacher	Gender	Ethnicity	Years in Current Position	Total Years of Experience
One	Female	Black	20+	27
Two	Female	White	3	12
Three	Female	White	2	24
Four	Female	Hispanic	1	19

Table 6. Case three teacher demographics.

Teacher	Gender	Ethnicity	Years in Current Position	Total Years of Experience
One	Female	White	4	23
Two	Female	White	15	19
Three	Male	White	7	7
Four	Female	Asian	1	4

Table 7. Case four teacher demographics.

Case	School	Grade	Size	Gender	Ethnicity	Range of Total Years Experience	Range of Years in Current Position
One	Lyndale	2	4	All female	All white	3-12	1-6
Two	Lyndale	5	5	All female	4 White 1 Asian	7-20+	1-11
Three	Deerbrook	3	4	All female	2 White 1 Black 1 Hispanic	12-27	1-20+
Four	Deerbrook	4	4	3 female, 1 male	3 White 1 Asian	4-23	1-15

Table 8. Comparison of all cases.

Factor	Description
Spectrum	Degree to which team moves beyond reporting to attempting to understand issue
Presence	Degree to which team members are present in discussion
Description of conflict or disorienting dilemma	Degree to which dilemma described and alternative perspectives explored
Attending to emotions	Degree to which teams recognize, explore, and gain insight into their emotions
Critical analysis and meaning making	Degree to which teams analyze and make meaning of issue for future changes to instruction

Table 9. Factors measured by Reflection Observation Rubric.

Reflection Level	Example
Non-reflective	Team members describe a teaching event with no attention to or mention of a dilemma or consideration of alternative approaches.
Technical	Team members provide an elaborate description of a teaching event presenting a dilemma. Conversation centers on general teaching functions and strategies, but little analysis or examination of prior practices is discussed and no rationale for ideas is provided.
Pedagogical	Team members move beyond reporting to reflecting and attempting to understand the event and teaching dilemma. They consider past practice and use evidence to support conclusions and new ideas.
Critical	Team members explore and critique assumptions, beliefs, and values as they reflect on a teaching dilemma considering the social and ethical implications. Teachers use evidence as they provide new ideas for instruction or redesigning learning goals.

Table 10. Reflection Observation Rubric levels and examples.

Data Collection Method	**Case One: Lyndale**			**Case Two: Deerbrook**		
	Team One	**Team Two**	**Principal One**	**Team Three**	**Team Four**	**Principal Two**
Observation One	2/5/15	3/19/15	N/A	2/24/15	2/24/15	N/A
Observation Two	3/19/15	4/9/15	N/A	3/11/15	3/11/15	N/A
Observation Three	4/16/15	4/30/15	N/A	3/24/15	4/14/15	N/A
Interviews	4/27/15	5/7/15; 5/8/15	4/16/2015	3/31/15	4/23/15	4/14/2015
Survey	May 2015	May 2015	N/A	April 2015	May 2015	N/A
Artifacts	Feb-June 2015	Feb-June 2015	Feb 2015	Feb-June 2015	Feb-June 2015	Feb 2015

Table 11. Data collection timeline.

	Team One	Team Two	Team Three	Team Four
Problem Identification	• Artifacts • Interviews	• Artifacts • Interviews	• Artifacts • Interviews	• Artifacts • Interviews
Developing a Shared Vision	• Artifacts • Interviews	• Artifacts • Interviews	• Artifacts • Interviews	• Artifacts • Interviews
Planning for Action	• Artifacts • Observation	• Artifacts • Observation	• Artifacts • Observation	• Artifacts • Observation
Analysis	• Artifacts • Interviews • Observation	• Artifacts • Interviews	• Artifacts • Interviews	• Artifacts • Interviews • Observation
Making Practice Public	• Interviews	• Interviews	• Artifacts • Interviews • Observation	• Artifacts • Interviews • Observation

Table 12. Evidence supporting enactment of components of collaborative inquiry process.

Observation	Team One	Team Two	Team Three	Team Four
One	Planning for action **(Technical)**	Planning for action **(Technical)**	Planning for action Making practice public **(Pedagogical)**	Planning for action **(Technical)**
Two	Planning for action **(Technical)**	Planning for action **(Technical)**	Planning for action **(Technical)**	Planning for action **(*Pedagogical)** *Discussion centered on inquiry process versus specific teaching experience
Three	Planning for action Analysis **(Technical)**	Planning for action **(Non-Reflective)**	Planning for action Making practice public **(Pedagogical)**	Analysis Making practice public **(Pedagogical)**

Table 13. Enacted components and reflection levels observed during each team meeting.

Factors Found to Influence Reflection	Components
Visual representation of data across classrooms	• Problem identification • Analysis
Connecting problem to student learning and instruction	• Problem identification
Use of student learning data	• Problem identification • Developing a shared vision • Planning for action • Analysis • Making practice public
Joint lesson planning	• Planning for action
Protocols prompting examination of instruction and changes to practice	• Problem Identification • Planning for action • Analysis • Making practice public

Table 14. Practices within components of collaborative inquiry that promote or undermine the pedagogical reflection.

Team One	Conversational Routines				Reflection Level
	Normalizing	Specifying	Revising	Generalizing	
Observation One (Planning for Action)	1	0	0	0	Technical
Observation Two (Planning for Action)	0	0	0	1	Technical
Observation Three (Planning for Action; Analysis)	0	5	7	1	Technical

Table 15. Team one conversational routines observed during team meetings.

Team Two	Conversational Routines				Reflection Level
	Normalizing	Specifying	Revising	Generalizing	
Observation One (Planning for Action)	0	4	0	0	Technical
Observation Two (Planning for Action)	0	3	4	1	Technical
Observation Three (Planning for Action)	0	2	0	0	Non-Reflective

Table 16. Team two conversational routines observed during team meetings.

Team Three	Conversational Routines				Reflection Level
	Normalizing	Specifying	Revising	Generalizing	
Observation One (Planning for Action; Making Practice Public)	1	3	4	1	Pedagogical
Observation Two (Planning for Action)	1	1	4	0	Technical
Observation Three (Planning for Action; Making Practice Public)	1	7	6	1	Pedagogical

Table 17. Team three conversational routines observed during team meetings.

Team Four	Conversational Routines				Reflection Level
	Normalizing	Specifying	Revising	Generalizing	
Observation One (Planning for Action)	0	2	2	0	Technical
Observation Two (Planning for Action)	2	1	8	1	*Pedagogical *Discussion centered on inquiry process versus specific teaching experience
Observation Three (Analysis; Making Practice Public)	0	1	4	2	Pedagogical

Table 18. Team four conversational routines observed during team meetings.

	Team One				Team Two					Team Three				Team Four			
Teacher	1	2	3	4	1	2	3	4	5	1	2	3	4	1	2	3	4
Individual Expression Score	21	14	11	14	18	16	6	17	18	20	16	17	19	21	14	9	19
Interpretation F = Favorable N = Neutral U = Unfavorable	F	N	N	N	F	F	U	F	F	F	F	F	F	F	N	U	F
Total average ***Significant discrepancy among teacher scores impacts team average.**	15 Neutral				15 *Neutral					18 Favorable				16 *Favorable			

Table 19. Team scores for individual expression.

Learning Process	Definition	Examples
Framing	Initial perception of issue, situation, person, or object based on past understanding and present input.	Describing/defining an issue or problem of practice.
Crossing Boundaries	When two or more individuals and/or teams communicate, they cross boundaries.	Sharing ideas and resources, lesson planning, logistical planning.
Integrating Perspectives	Group members synthesize their divergent views such that apparent conflicts are resolved through dialectical thinking, not compromise or majority rule.	Initial disagreement over topic (curriculum, student, pedagogy) but through discussion and debate, consensus about future actions is reached.
Reframing	Process of transforming perception into new understanding or frame.	Revising a viewpoint; shift (or transformation) in beliefs about instructional approach leading to changes in future actions.
Experimenting	Action undertaken to test hypothesis or discover something new.	Trying new strategies, student groupings, or materials to evaluate efficacy of change.

Table 20. Learning process contributions to teacher learning outcomes.

Score Interpretations			
Team Learning Outcomes	Unfavorable 7-24	Neutral 25-32	Favorable 33-49

Table 21. Guidelines for scoring team learning processes and outcomes.

Team	Learning Outcomes
One	Favorable 43.75
Two	Favorable 43.6
Three	Favorable 42.25
Four	Favorable 41.25

Table 22. Team survey scores measuring team learning outcomes.

	Content and Pedagogy	Knowledge of Students	Self-Awareness	Confidence & Sense of Self	Connection with Team
Team One	Favorable (3.16)	Favorable (3.5)	Neutral (2.8)	Favorable (3.13)	Favorable (3.25)
Team Two	Favorable (3.27)	Favorable (3.6)	Neutral (2.8)	Favorable (3.2)	Favorable (3.2)
Team Three	Favorable (3.25)	Neutral (2.5)	Neutral (2.3)	Favorable (3.5)	Favorable (3.75)
Team Four	Favorable (3.3)	Neutral (2.75)	Neutral (2.5)	Favorable (3.25)	Neutral (2.75)

Table 23. Team survey scores measuring individual learning outcomes.

VITA

NAME:	Ramona DeCristofaro
EDUCATION:	B.A., Special Education, Northern Illinois University, DeKalb, Illinois, 2003
	M.S., Special Education Advanced Practices, Northern Illinois University, DeKalb, Illinois, 2006
	M.S., Educational Leadership, Northern Illinois University, DeKalb, Illinois, 2008
	Ph.D., Curriculum Studies, University of Illinois at Chicago, Chicago, Illinois, 2016
PROFESSIONAL EXPERIENCE:	Assistant Director for Student and Special Services, Wilmette Public School District 39, Wilmette, Illinois
	Student Services Coordinator, Wilmette Public School District 39, Wilmette, Illinois
	Learning Behavior Specialist, Wilmette Public School District 39, Wilmette, Illinois
	Learning Facilitator, Sycamore Community Consolidated School District 427, Sycamore, Illinois
PROFESSIONAL MEMBERSHIP:	Illinois Alliance of Administrators of Special Education