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KATHRYN M. ACKLEY
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BUILDING TRUST AND EFFICACY THROUGH CRITICAL FRIENDS GROUPS:
A PROCESS EVALUATION

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL LEADERSHIP AND POLICY STUDIES

BY

_____
Dr. Curt Adams, Chair

_____
Dr. Patrick Forsyth

_____
Dr. Timothy Ford

_____
Dr. Beverly Edwards

_____
Dr. Brigitte Steinheider

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**Dedication**

This dissertation is dedicated to my husband, Zach, and to my children, Griffin, Susannah, and Max. Zach, without your continued support and ongoing sacrifices for our family, would never have had the courage, nor the ability to do this work. Thank you for being my rock, my best friend, and the amazing husband and father that you are. I am so grateful for you, and I love you so very much.

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**Abstract**

Two ongoing challenges that schools face, particularly urban schools, are finding ways to develop and retain quality teachers and to contribute to student academic success. There are claims that collaborative structures, such as Professional Learning Communities (PLCs), can nurture teacher learning and job satisfaction, and overall school effectiveness. Additionally, research has shown both faculty trust in colleagues and perceived teacher collective efficacy to be correlated with student achievement. This dissertation evaluates the implementation of a particular type of collaborative learning community, called Critical Friends Groups (CFGs) and the relationship between effective CFGs and school levels of faculty trust in colleagues and teacher collective efficacy. CFGs are a particular kind of learning community that is set apart by the use of specific protocols and the leadership of a trained facilitator to guide collaborative work.

The theory of action for this dissertation is based on Bandura's social cognitive theory and posits that CFGs have the potential to create a social context for teacher learning within schools, in which faculty trust and collective efficacy are present. The following evaluation questions are addressed:

1. How do teachers in the district perceive the effectiveness of CFGs?
2. Is there a difference in the average CFG effectiveness across schools in the district?
3. Is there a relationship between teacher perceived CFG effectiveness and levels of Faculty Trust in Colleagues and Collective Teacher Efficacy?

4. What is known about the school climate for schools with different levels of teacher perceived CFG effectiveness?
5. In schools with high teacher perception of CFG effectiveness, what has contributed to the successful implementation of CFGs?

This evaluation found that there is, in fact, a statistically significant relationship between teachers' perceptions of the effectiveness of their CFGs and school levels of faculty trust in colleagues and teacher collective efficacy. Additionally, it found relationships between CFG effectiveness scores and other school climate variables associated with student success. Finally, it identified school leader behaviors that contributed to the successful implementation of CFGs.

While the successful implementation of CFGs is dependent upon teacher ownership, the role of the school leader is critical as well. Implications for school leaders seeking to implement CFGs as a strategy for increasing trust and efficacy include a commitment of time for training and ongoing implementation of CFGs, as well as a need for patience to allow CFGs and the resulting trust and efficacy to develop over time.

## I. Introduction

Research has found both faculty trust in colleagues and teacher collective efficacy to be correlated with student achievement (Adams, 2013; Bryk & Schneider, 2003; Cosner, 2009; Goddard & Goddard, 2001; Goddard, Hoy, & Hoy, 2000; Hoy, Tarter, & Witkoskie, 1992; Lee, Zhang, & Yin, 2001; Tschannen-Moran & Hoy, 1997). Additionally, there are claims that collaborative structures, such as Professional Learning Communities, can enhance school effectiveness (Barber & Mourshed, 2009; Brice, Esmonde, Ross, Dookie, & Beatty, 2010; DuFour & Mattos, 2013; Hargreaves, 2001; Lee, Zhang, & Yin, 2001; Lord, 1994; Marzano Research Laboratory, 2010; Saunders, Goldenberg, & Gallimore, 2009; Vescio, Ross, & Adams, 2008). On balance, the education evidence presents a compelling case for cooperative interactions in the service of good teaching and desirable student outcomes (Morrissey, 2000). Uncertainty, though, continues to surround the structures and processes for bringing about meaningful professional learning (Bambino, 2003).

Professional Learning Communities have been defined as "a group of teachers who meet regularly with a common set of teaching and learning goals, shared responsibility for work to be undertaken, and collaborative development of pedagogical knowledge as a result of the gatherings" (Richmond & Manokore, 2010, p. 545). Educators and educational administrators generally agree that schools should function as learning communities (Lee, et al., 2001); however, the challenge lies in ensuring these learning communities function in ways that will positively affect teaching and learning. Saunders, et al. (2009) found that simply providing time for educators to meet will have no effect unless meetings focus on the right work. It is important to be able to

distinguish between a community of teachers committed to getting better at their practice and a group of teachers merely going through the motions (Richmond & Manokore, 2010). Effective conversations and interactions can be essential meaning making processes if they are structured and facilitated in ways that engage teachers in the study of teaching and learning (Saunders, Goldenberg, & Gallimore, 2009). It is this challenge that supports the idea that a more structured approach to learning communities is needed. Evidence lends support for the use of Critical Friends Groups (CFGs) as an effective mechanism to structure intentional, professional conversations among teachers.

CFGs are a particular variety of PLC that use structured interactions to guide collaborative learning (School Reform Initiative, 2014). What initially sets CFGs apart from less structure learning communities is the use of protocols to guide group discussion and learning. Additionally, CFGs employ the leadership of a trained facilitator who ensures protocols are adhered to and all members of a group have equitable opportunities to be heard. Research supports the implementation of CFGs processes and protocols as a way to improve what teachers practice by moving conversations beyond the superficial, low-level collaboration of less structured learning communities, to deeper levels of dialogue and learning about teaching (Moore & Carter-Hicks, 2014; Quate, 2004).

To date, many studies have concentrated on describing and defining characteristics of PLCs and CFGs. Although useful, descriptive accounts have left the connection between learning communities and other teacher or school-level factors, such as faculty trust in colleagues or collective teacher efficacy relatively unexplored

(Lee, Zhang, & Yin, 2001). This evaluation examined teacher collaborative professional learning through CFGs, and sought to determine the relationship between CFG effectiveness and faculty trust in colleagues and collective teacher efficacy. Assuming that raising student achievement is a key challenge faced by schools, and knowing that faculty trust in colleagues and teacher collective efficacy each has the potential to affect student achievement, this study explored the effectiveness of one promising approach to increasing conditions that support teacher growth and enhance student learning. What makes this study unique from others is that it sought to determine if CFGs processes in one sample of schools are related to conditions supportive of teacher learning.

**Research Problem**

This evaluation addressed both a problem of practice and a research problem. From a practice perspective, the implementation of CFGs addressed the ongoing challenge schools, particularly urban schools, face in developing and retaining quality teachers. In Tulsa Public Schools alone, nearly one third of the district's teachers have two years of experience or less. Teacher turnover rates have increased steadily over the past several years, reaching 18% overall attrition in the 2013-2014 school year, with the attrition rate among novice teachers reaching 28% (TPS Human Capital Analysis, 2016). Given this challenge, schools need interventions designed to develop cultures in which the conditions needed for learning, faculty trust and collective teacher efficacy, exist. Even though this study does not extend to teacher turnover, it establishes evidence to assess the usefulness of CFGs in supporting teachers and their continuous development.

This evaluation takes an approach different from existing research on CFGs. Most existing research focuses on the characteristics of effective PLCs and CFGs, as well as school improvement as a result of implementation (Bruce, et. al., 2010). Evidence supports the implementation of CFGs as a vehicle for teachers to dialogue about their practice and learn from one another (School Reform Initiative, 2014), but evidence has not made known the relationship between effective CFGs and healthy normative conditions like faculty trust in colleagues and collective teacher efficacy. This study examined the degree to which CFG effectiveness was related to higher levels of faculty trust in colleagues and perceived collective teacher efficacy. It also examined differences in school climate related to CFG effectiveness, and it used interviews with principals to describe leadership factors supportive of CFG development.

**Research Purpose**

This study was based on a process evaluation of the theory of action for Critical Friends Groups as they are implemented in Tulsa Public Schools. A process evaluation is designed to provide evaluation evidence on the implementation and delivery of interventions, and provide leaders with the chance to revise and improve interventions to help them have the best chance of accomplishing their intended goals or outcomes (McDavid & Hawthorne, 2006). This process evaluation provides evaluation data on the implementation of CFG processes in schools, to determine if faculty trust in colleagues and teacher collective efficacy are higher in schools with effective CFGs and if so, to understand why and how elements of the CFG protocols support trust and efficacy formation.

Critical Friends Groups are a form of Professional Learning Community that provides structured protocols to guide teacher collaboration. The purpose of this study was to determine if there is a relationship between CFG implementation and levels of faculty trust in colleagues and perceived collective teacher efficacy. This study addressed the following research questions:

1. How do teachers in the district perceive the effectiveness of CFGs?
2. Is there a difference in the average CFG effectiveness across schools in the district?
3. Is there a relationship between teacher perceived CFG effectiveness and levels of Faculty Trust in Colleagues and Collective Teacher Efficacy?
4. What is known about the school climate for schools with different levels of teacher perceived CFG effectiveness?
5. In schools with high teacher perception of CFG effectiveness, what has contributed to the successful implementation of CFGs?

**Organization of Dissertation**

This dissertation is organized into six sections. The first section presents an introduction to the research presented, including the research problem, research purpose, organization of dissertation, and definition of key terms. The second section presents a review of the literature on teacher professional learning and Professional Learning Communities, Critical Friends Groups, the importance of trust in schools, and collective teacher efficacy. The third section of this dissertation presents the theory of action for this research. Following the theory of action, the methods section presents information on the evaluation design, data source and analysis for this research. The

fifth section presents the result of this research, including psychometric evidence regarding the reliability and validity of survey items used, descriptive data for evaluation questions one, two, and four, correlation data for research question three, and a summary of principal interview data for research question five. The fourth section of this dissertation presents a discussion of CFGs as a strategy to build trust and efficacy, challenges to developing functional CFGs, and implications for school leadership. The final section of this dissertation presents a conclusion, including contributions to Tulsa Public Schools implementation of CFGs and to existing CFG research.

**Definition of Key Terms**

The following key terms related to this research are used throughout this dissertation as defined in this section.

*Professional Learning Community (PLC).* A Professional Learning Community is defined as "a group of teachers who meet regularly with a common set of teaching and learning goals, shared responsibility for work to be undertaken, and collaborative development of pedagogical knowledge as a result of the gatherings" (Richmond & Manokore, 2010, p. 545.)

*Critical Friends Group (CFG).* A Critical Friends Group is a specific form of professional learning community that utilizes intentional structures and processes, called protocols, and skilled facilitation to guide teacher collaboration. Protocols have been developed to guide teachers in the following types of collaborative work: investigating teaching, learning and assessment, examining data, exploring professional dilemmas, focusing on students, learning from tests, emphasizing equity and excellence, extending practice, and observing one another (The School Reform Initiative, 2014).

*Faculty Trust in Colleagues.* Faculty trust in colleagues is defined as the faculty's belief that teachers can depend on each other in difficult situations, and that teachers can rely on the integrity of their colleagues (Tschannen-Moran & Hoy, 1997). Further, faculty trust is defined as "a collective form of trust in which the faculty has an expectancy that the word, promise, and actions of another group of individuals can be relied upon and that the trusted party will act in the best interest of the faculty" (Forsyth, Adams, & Hoy, 2011, p. 4).

*Collective Teacher Efficacy.* Collective Teacher Efficacy refers to the shared perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students. Collective efficacy represents the shared views of group members regarding the performance capabilities of the group as a whole (Goddard, et. al., 2000).

## II. Review of Literature

The review of literature focuses on the concept of professional learning as a strategy for increasing school and teacher effectiveness and presents research on collaborative strategies that have been shown to work in schools. The case for CFGs is made by presenting research on the benefits and limitations of Professional Learning Communities, as well as evidence on the contribution of CFGs to collaborative learning processes. The literature review concludes with an examination of faculty trust and collective teacher efficacy.

### Teacher Professional Learning

One of the ongoing challenges for those who examine school improvement is to learn how schools as organizations can contribute to student academic success (Goddard, Hoy, & Hoy, 2000). Innovative approaches to school and instructional improvement cited by Jaquith, Mindich, Chung Wei, and Darling-Hammond (2011) include ideas about formative assessment and progress monitoring, needs based and data-driven decision making, the importance of leadership teams, and professional learning communities. According to Opfer and Pedder (2011), the importance of improving schools, increasing educator effectiveness, and improving the quality of student learning has led to a focus on the professional development of teachers as one important way of achieving these goals. Jaquith, et al. (2011) claim, the recent years of school reform that have placed a premium on improving school and student results, have led to unparalleled investments in educator professional development. They go on to state that "since the enactment of No Child Left Behind, Title II has provided nearly $3 billion annually to states and districts to improve teacher qualifications and teacher

quality, with nearly 40% of that used for professional development (Jaquith, et al., 2011, p. 34).

Yet, Opfer and Pedder (2011) report that much of the research on professional development has generated disappointing outcomes, finding teacher professional learning activities are often considered to be ineffective. This could be attributed to research showing that the vast majority of educational professional development programs have separated learning opportunities from the natural classroom context (Bruce, Esmonde, Ross, Dookie, & Beatty, 2010). Research on effective processes to develop teacher expertise suggests that professional development needs to be ongoing, intensive, and connected to practice and school initiatives. Additionally, it should focus on the teaching and learning of specific content, and build strong working relationships among teachers (Jaquith, et al. 2011).

Teacher collaboration has been identified by some researchers and educators as one of the most important features of school culture for nurturing teacher learning, teacher job satisfaction and teacher effectiveness (Bruce, et al., 2010). Common strategies recommended to transform schools into high performing learning communities include shared leadership among teachers and administrators, on-site professional development emphasizing instruction and teamwork, and building trust and collaboration among faculty and administrators (Simmons, 2011). A study of Oklahoma schools conducted by the Marzano Research Laboratory in 2010 found that seven out of nine schools showing improvement over the course of the study "were heavily involved with Professional Learning Communities (PLC) work and/or professional development focused on best practices in instruction" (p. 12). Marzano

(2010) suggests some formal framework for teacher and administrator interactions, such as PLCs, should be implemented to facilitate collaboration and promote teacher growth.

Structuring schools as professional learning communities has been supported by education researchers as an efficient and effective way to improve teacher effectiveness (Lee, Zhang, & Yin, 2001). In a study of high-performing school systems around the world, researchers concluded that successful systems structured their schools as PLCs to afford the teacher collaboration critical to influential professional development (Barber & Mourshed, 2009). DuFour and Mattos (2013) argue that the most powerful strategy for improving both teaching and learning is not "micromanaging instruction, but creating the collaborative culture and collective responsibility of a professional learning community" (p. 37). Simmons (2011) suggests that "deep, sustained change in schools comes from the inside out, empowered and supported by the leaders in the organization" (p. 39), and concludes that, by empowering those closest to the problem, leaders promote a sense of ownership, crucial to continuing, sustained improvement. According to DuFour and Mattos (2013) rather than micromanaging teachers, principals should head up collective efforts to monitor student achievement alongside teachers, through professional learning communities.

Richmond and Manokore (2010) define a Professional Learning Community as "a group of teachers who meet regularly with a common set of teaching and learning goals, shared responsibility for work to be undertaken, and collaborative development of pedagogical knowledge as a result of the gatherings" (p. 545). The argument that a school should function as a learning community is generally accepted by educators and educational administrators (Lee, et al., 2001); however, there is disagreement in the

literature about what constitutes a teacher learning community, particularly with respect to structure, goals, and work (Richmond & Manokore, 2010). Saunders, et. al. (2009) found that simply providing time for educators to meet will have no effect on student learning unless meetings focus on the right work. It is important to be able to distinguish between a community of teachers committed to getting better at their practice and a group of teachers sitting in a room for a meeting (Richmond & Manokore, 2010).

Richmond and Manokore (2010) suggest a shared vision, that will result in creation of environments that are supportive and conducive to teacher learning, is critical for the development of successful and productive PLCs. Lee, et.al. (2001) argue,

> What school principals and educational administrators expect from a PLC, seen as a learning organization, are the enhancement of teachers' senses of belonging to their organization, their strong support for the schools' shared values, and consequently their active commitment to students' learning. (p. 821)

Richmond and Manokore (2010) found that teachers identify and value collegiality as crucial for their own professional growth and feel that they learn more about teacher practice from their PLC peers than from discussions with non-project colleagues.

A review of eleven studies focusing on the effect of PLCs suggested that well-developed PLCs could positively improve teaching practices and student learning activities (Vascio, Ross, & Adams, 2008). So, the question is not whether teacher PLCs are important, but rather how to build, support, and maintain such communities in complex and challenging settings (Richmond & Manokore, 2010). It is this challenge

of maintaining successful, focused, and productive PLCs that lend to the idea that a more formalized structure for collaboration is needed. Critical Friends Groups have the potential to provide that structure and are explored in depth in the next section.

**Critical Friends Groups**

Critical Friends Groups (CFGs) developed out of the work of the Annenberg Institute for School Reform at Brown University. First launched in the summer of 1995, a CFG is typically a group of eight to twelve educators who meet regularly to discuss issues of practice and student learning (Moore & Carter-Hicks, 2014). CFGs utilize intentional structures and processes to assist educators in giving and receiving feedback on their practice, with student improvement at the center of the work (School Reform Initiative, 2014). Cox (2010) claimed that CFGs contain all the attributes of high quality professional development. CFGs are job-embedded, ongoing, and personalized professional learning experiences.

Two important characteristics differentiate CFGs from other forms of learning communities. First, CFGs use various protocols to guide group discussion and examination of adult and student work, explore problems of practice, and learn from texts (Moore & Carter-Hicks, 2014). Protocols are tools for building the skills and culture necessary for reflective dialogue and collaboration (School Reform Initiative, 2014). Second, trained facilitators structure conversations so that teachers collectively make sense of instructional issues.

For protocols, the School Reform Initiative (2014) has published over fifty different protocols, designed to support educators engaging in the following types of collaborative work: investigating teaching, learning, and assessment, examining data,

exploring professional dilemmas, focusing on students, learning from texts, emphasizing equity and excellence, extending practice, and observing one another. One commonly used protocol, the Consultancy Protocol, helps participants think more openly about a particular, concrete dilemma they are facing, and has two main purposes—to develop participants' ability to see and describe the dilemmas that are the essential element of their work, and to help each other understand and cope with them. Another protocol, the Four "A"s Text Protocol, is designed to allow participants to explore and learn from texts, while also providing participants insight into each other's values and intentions. During a Four "A"s Text Protocol, participants respond to text by sharing their responses to four questions—What do you AGREE with in the text? What ASSUMPTIONS does the author of the text hold? What do you want to ARGUE with in the text? What part of the text do you want to ASPIRE to (or ACT upon)? A final example, the Success Analysis Protocol, lets individuals share professional successes with colleagues in order to gain insight into the conditions that lead to those successes, so participants can do more of what works (School Reform Initiative, 2014).

The above are only a small sample and description of the varieties of protocols available and the purpose of their use. Although protocols vary in terms of their specific purposes and features, they are designed to structure professional conversations by outlining a set of agreed upon guidelines for the discussion and to clearly delineate what role (facilitator, presenter or participant) each group member plays (Allen & Blythe, 2004). In all cases, protocols are designed to guide conversations, raise assumptions, reflect on our work, and to collaborate in order to better serve students (School Reform Initiative, 2014). Through the use of protocols, learning communities

ensure the organizational structures are in place for ongoing focus on instructional improvement, and can avoid the potential problems with less structured PLCs named by Morrissey (2000)—"disorganization, unclear directions and processes, few to no avenues for problem solving or collaboration among staff, and frustrated teachers" (p. 14).

The second characteristic differentiating CFGs from other learning communities is the leadership of a trained facilitator whose role it is to ensure all voices in the group are heard. Prior to a CFG session, the facilitator typically meets with the CFG member who will be presenting his or her work or dilemma. They discuss the presenter's reason for bringing that work to the group, develop a framing question to guide the discussion, and select a protocol that best matches the presenter's goal for the session (Quate, 2004). During a CFG session, the facilitator's responsibilities include ensuring all participants understand and are engaged in the protocol, redirecting if the protocol is not being honored, monitoring time for the group, and advocating for the presenter to receive the feedback or assistance he/she has requested (School Reform Initiative, 2014).

The final responsibility of the facilitator is to lead the debrief phase of the protocol, focusing on what went well, what was challenging, and what needs to be considered in order to make the next CFG session successful (School Reform Initiative, 2014). In her research on the successful implementation and the development of PLCs, Morrissey (2000) emphasizes the importance of a facilitator who will encourage, support, and share strategies empowering staffs to plan together or to dialogue with one another about their work. It is important that the CFG facilitator and participants

understand the use of the word "critical" in Critical Friends Groups. In this case, critical does not refer to criticism of work, but instead, refers to how members are vital to each other's learning (Quate, 2004).

The influence of the formation of CFGs on teacher growth has been recognized in multiple studies (School Reform Initiative, 2014). Moore and Carter-Hicks (2014) claim that CFGs have a place in education as a means to improve what teachers do and affect students in a meaningful way. Bambino (2002) suggests the CFG process acknowledges the complexity of teaching and provides structures for teachers to improve their teaching by giving and receiving regular feedback about issues that affect their performance. She also claims that "Critical Friends Groups help teachers improve instruction and student learning…and have been the catalyst for changes in the teaching, learning, and culture and climate of learning communities in a variety of schools" (Bambino, 2003, p. 5).

Evidence shows that CFGs have strengthened the intentional and professional discourse among teachers. Lord (1994) found that CFGs promote an inquiry-oriented, practice-based, self-disclosing form of conversation that creates opportunities for teachers to raise questions about and carefully examine their practice and students' learning. Cox (2010) suggests that a Critical Friends Group is an ideal way to shift the paradigm from teacher as expert to teacher as learner. Dunne and Honts (1998) reported that CFG participants all over the country have said repeatedly that "CFGs have provided them with the most powerful professional development experiences they have ever encountered" (p. 8). Quate (2004) concluded that, through the implementation of Critical Friends Groups processes and protocols, teachers can move

beyond the superficial, low-level collaboration occurring in poorly structured Professional Learning Communities, to deeper levels of dialogue and learning about teaching practices, student work, teacher tasks, and professional dilemmas (Quate, 2004).

So, how do CFGs foster a deep and ongoing learning experience for educators? Moore and Carter-Hicks (2014) determined that successful CFGs are ones in which members become invested in the learning of others. Quate (2004) identified the following critical elements of a successful CFG: a well-trained facilitator, voluntary attendance, time in the day to meet, established norms to guide the group's work, revolving roles so that a variety of members have the opportunity to present work and to facilitate protocols, and a focus on authentic adult and student work products.

The above elements describe the structures and process of CFGs, but what makes the conversation functional depends on trust. Trust has been shown to be an important element in the work of Critical Friends Groups. Moore and Carter-Hicks (2014) found the design of the CFG demands a platform of trust, in which members bring academic and professional dilemmas. Andreu, et. al. (2003) suggest some teachers are reluctant to examine each other in a critical way, and therefore it is necessary to build an atmosphere of trust, with every member understanding how the CFG process works. Moore and Carter-Hicks (2014) found that trust grows as member interact, support and learn from one another, and develop deeper relationships. To understand the alignment between structures of CFG and trust, it is necessary to examine the trust literature.

**The Importance of Trust**

Increasingly, trust is seen as a critical component of well-functioning organizations (Tschannen-Moran & Hoy, 1997), and scholars have identified collegial trust as an important element of school capacity (Cosner, 2009). Tschannen-Moran and Hoy (1997) define faculty trust in colleagues as the faculty's belief that teachers can depend on each other in difficult situations, and that teachers can rely on the integrity of their colleagues. Forsyth, Adams, and Hoy (2011) further define faculty trust as "a collective form of trust in which the faculty has an expectancy that the word, promise, and actions of another group or individual can be relied upon and that the trusted party will act in the best interest of the faculty" (p. 4). They go on to provide a more comprehensive definition of trust, in which vulnerability, risk, and interdependence are key elements. According to Forsyth, et. al. (2011), trust is understood as "a condition in which people or groups find themselves vulnerable to others under the conditions of risk and interdependence" (p. 18).

In addition to the definition and elements above, Forsyth, et. al. (2011) present five facets of trustworthiness that are commonly described in the literature—benevolence, reliability, competence, honesty, and openness. A sense of benevolence is the most common facet of trust, and can be defined as the assurance that one's interests will be protected by the trusted group or individuals. The second facet of trust, reliability, refers to the degree to which one individual can depend upon another for positive action, and "implies a sense of confidence that one's needs will be met in positive ways" (Forsyth, et. al., 2000, p. 18). While the first two facets of trust relate primarily to an individual's or group's intentions, the third facet, competence, requires

that the trustee have the necessary skills required to fulfill an expectation or contribute to the accomplishment of a goal. Honesty is the fourth facet of trust. "Honesty speaks to character, integrity, and authenticity [and is seen by most scholars and researchers] as a pivotal feature of trust" (Forsyth, et. al, 2000, p. 19). The fifth and final facet of trust identified is openness, defined as "the extent to which relevant information is shared; actions and plans are transparent" (Forsyth, et. al., 2000, p. 19), producing trust. Forsyth, et. al. (2011) summarize the above with the following statement about trust:

> In sum, trust is a state in which individuals and groups are willing to make themselves vulnerable to others and take risks with confidence that others will respond to their actions in positive ways, that is, with benevolence, reliability, competency, honesty, and openness (p. 20).

Research has shown links between faculty trust in colleagues and school effectiveness (Hoy, et. al., 1992). Cosner (2009) found that faculty trust in colleagues facilitates knowledge creation by supporting professional interactions that promote sense making and shared understanding of instructional performance. The work of Bryk and Schneider (2003) revealed links between trust and quality school performance. They note the following effects:

> (a) teacher willingness and efforts to innovate in the midst of reform initiatives, (b) public problem solving within schools, (c) social controls that develop within teacher communities, and (d) teacher commitment and attachment to the school and its mission (p. 253).

Lee, et. al. (2001) suggest that faculty trust in colleagues is essential for the fulfillment of a school's objectives because the people in a trusting community are

likely to feel safe to make mistakes, discuss them, learn from them, and then find ways to solve problems. Adams (2013) found that interactions among teachers have the potential to determine the instructional climate in schools, and concluded when trust is low, teachers are more likely to teach in isolation, limiting their interactions and collaboration with colleagues. In a 2003 study of Chicago Public Schools, Bryk and Schneider (2002) found that "schools with high trust were much more likely to demonstrate marked improvements in students learning" (p. 43). Collegial trust is closely linked with how individual teachers of a school treat each other (Tschannen-Moran & Hoy, 1997) and has been found to be important in both the informal teacher learning behaviors of sharing and seeking help and feedback, as well as in the more formal collaborative learning contexts, such as professional learning communities (Bryk & Schneider, 2003). Baier (1985) concluded that trust is essential for the effective co-operation and communication which are the basis for productive relationships.

In regards to teachers and their improved capacity, Adams (2013) argued, "information does not lead to shared understanding and action unless individuals and groups are willing to risk vulnerability" (p. 367). Trust is necessary to take risks. Tschannen-Moran and Hoy (1997) found that trust is associated with an environment of honesty, collegiality, professionalism, and authenticity. Adams (2013) concluded high levels of trust in schools serve as a signal of conditions that promote teaching effectiveness, whereas low trust can have harmful consequences for instructional capacity. Hargreaves (2001) found that high trust promotes information sharing, knowledge creation and learning among school professionals. Conversely, when trust is

low, teachers are more likely to teach behind closed door and limit interactions with their colleagues (Adams, 2013).

As the above evidence indicates, trust matters for teaching performance, but how can schools develop the trust that is critical for improved capacity? Rousseau, et. al. (1998) argue that trust develops through recurring cycles of social interactions which demonstrate the likelihood of a group's trustworthy behavior. Forsyth, et. al. (2011) support this idea with their claim that "collective trust is a social construction, which emerges during repeated exchanges among group members" (p. 24). Not just any type of exchange or interaction will produce trust. Interactions need to position the trustee as benevolent, competent, open, honest, and reliable (Adams, 2013).

This research proposes the implementation of CFG processes as one strategy for providing structures for high quality interactions and increased trust among school faculty. CFGs, in theory, structure teacher discourse in ways that express the trustworthiness of colleagues. As teachers work together to problem solve and support one another in tackling common challenges and professional dilemmas, relationships can grow beyond superficial collegiality to deeper levels of trust among the group (Quate, 2004). CFGs support conditions in which teachers feel invested in one another's interests and well-being, develop confidence in each other's skills, and communicate honestly and openly with one another. Trust grows as members interact, support and learn from one another, and develop deeper relationships (Moore & Carter-Hicks, 2014).

**Collective Teacher Efficacy**

Similar to trust, collective teacher efficacy has functional and productive benefits to teachers and schools (Goddard, et. al, 2000). Efficacy is defined as the "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Collective teacher efficacy, the shared perceptions of teacher in a school that the efforts of the faculty as a whole will have a positive effect on students is based on Bandura's social cognitive theory, a unified theory of behavior change (Goddard, et. al., 2000). While a teachers' sense of self-efficacy is an individual variable, perceived collective efficacy is a school level variable (Lee, et. al., 2001). In other words, perceived self-efficacy refers to an individual's beliefs in his or her own ability to produce certain actions, whereas perceived collective efficacy represents the shared views of group members regarding the performance capability of the group as a whole (Goddard, et. al., 2000).

Bandura (1997) identified four sources of efficacy-shaping information, critical for the development of both individual and collective efficacy beliefs: mastery experience, vicarious experience, social persuasion, and affective state. Goddard, et. al. (2004) claim mastery experience is the most powerful source of efficacy information, and found that "the perception that a performance has been successful tends to raise efficacy beliefs, contributing to the expectation that performance will be proficient in the future" (p. 5). The concept of vicarious experience is one in which a skill is modeled by someone else, and can enhance collective efficacy because teachers learn from observing the achievement of their colleagues, as well as the success of other schools (Goddard, et. al., 2000).

Goddard, et. al. (2004) identify social persuasion as another means of strengthening a faculty's confidence that it can achieve its goals. Social persuasion may involve formal feedback on performance from a supervisor or colleague, or may be as simple as encouragement or discussions about teachers' ability to engage students in meaningful ways. The final source of information thought to shape efficacy beliefs is affective states, or levels of emotional arousal—either positive or negative. Affective states have the potential to influence how teachers in a school react to the various challenges they face (Goddard, 2004).

Research has shown links between student achievement and both teachers' beliefs in their own instructional efficacy, as well as teachers' beliefs about the collective efficacy of their school (Goddard, et. al., 2004). One of the earliest studies of collective efficacy was conducted by Bandura (1993) who showed that collective efficacy is "significantly and positively related to school-level achievement" (Goddard & Goddard, 2001, p. 809). Additional research by Goddard, et. al. (2000) also suggests that perceived collective efficacy is strongly related to student achievement in schools. Even after controlling for students' prior achievement, race/ethnicity, SES, and gender, collective efficacy beliefs have stronger effects on student achievement than student race or SES (Goddard, et. al., 2004).

Goddard, et. al. (2004) suggest teachers with a high sense of efficacy are more likely to overcome challenges and be persistent when experiencing failure. "Such resiliency, in turn, tends to foster innovative teaching and student learning" (p. 4). The positive roles of PLCs in improving teachers' collective efficacy were partly supported in a study by Lee, et. al. (2001).

This study is based upon the theory that both faculty trust in colleagues and collective teacher efficacy can be influenced by high quality teacher interactions and collaboration. CFG processes and protocols can provide the structure needed to accomplish these high quality interactions and collaboration, and contribute to the social context needed for teacher learning. In theory, CFGs structures provide opportunities for teachers to observe and share in one another's successes, give and receive feedback, and engage in positive, growth oriented conversations focused on increasing the effectiveness of individuals and the collective group. As teachers observe their colleagues growing in their practice, and building their individual skills over time, they can develop increasing confidence in one another's performance, leading to higher levels of collective teacher efficacy. CFGs provide an environment in which the four sources of efficacy-shaping information are supported. As these sources are influenced, the senses of efficacy teachers need to overcome challenges and persist in demanding situations develop, fostering innovative teaching and student learning (Goddard, et. al., 2004).

## III. Theory of Action for CFGs in Tulsa Public Schools

CFGs were first introduced in Tulsa Public Schools in 2010. Four schools were involved in the initial implementation of CFGs as a part of a federal School Improvement Grant they received. In 2014, the opportunity to implement CFGs was expanded to all schools in the district. All school leaders and select teacher leaders from each site were trained in CFG processes and protocols during the summer leading into the 2014-2015 school year. The goal of CFG implementation was to expand upon the work of Professional Learning Communities that had been established over several years, and improve the quality of teacher collaborative learning that was occurring.

Figure 1 represents the theory of action for the implementation of CFGs in Tulsa Public Schools. As is illustrated, the path to teaching effectiveness goes through teacher knowledge creation. Knowledge creation depends on a social context where trust and efficacy enable teachers to experiment with different instructional strategies believed to support student learning. CFGs establish processes and norms supportive of a social context conducive to knowledge creation and improvement (Bambino, 2003). Before the empirical investigation, it is important to describe the logic of CFG and the theory of action behind the framework.

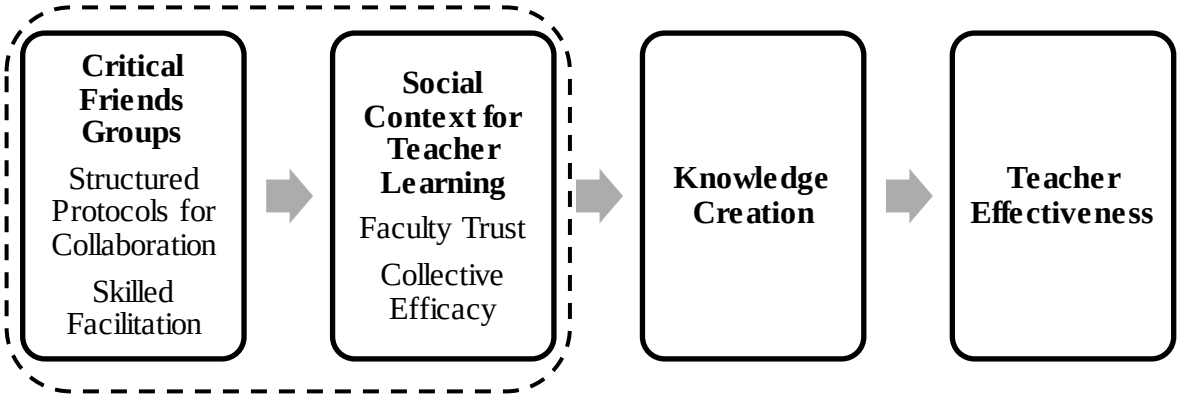


*Figure 1*

*Theory of Action*

Structured protocols for collaboration and the use of a skilled facilitator set CFGs apart from other collaborative groups. Although protocols vary in terms of their specific purposes and features, they are designed to structure professional conversations and provide equity of voice to all participants by outlining a set of agreed upon guidelines for the discussion, and to clearly delineate what role each group member plays (Allen & Blythe, 2004). Protocols have been developed to guide educators in investigating teaching, learning, and assessment, examining data, exploring professional dilemmas, focusing on students, learning from texts, emphasizing equality and excellence, extending practice, and observing one another. In all cases, protocols are designed to guide conversations, raise assumptions, reflect on teacher and student work, and to collaborate in order to better serve students. The CFG facilitator is responsible for guiding the group through the protocol, ensuring all participants understand and are engaged, redirecting if the protocol is not being honored, monitoring the group for time, and advocating for participants to receive the feedback and assistance requested (School Reform Initiative, 2014).

Although it is important to test the entire theory of action, at this early stage of development the focus of this study was on the more proximal effects of greater faculty trust in colleagues and collective teacher efficacy. Theory and evidence to support the relationship between the elements of CFGs and faculty trust and collective efficacy comes from trust and social cognitive theories.

According to Hargreaves (2001), teaching and learning is a social and human enterprise shaped by relationships, interactions, and information exchanges. Social cognitive theory (Bandura, 1993) and collective trust theory (Forsyth, Adams, & Hoy, 2011) can be used to conceptualize and explain how teacher collaboration through Critical Friends Groups can increase teacher collective efficacy. Social cognitive theory was introduced by Canadian psychologist Albert Bandura in 1986. The general concept surrounding social cognitive theory is that learning occurs in a social setting and much of what is learned is gained through the observation of others. Social cognitive theory expended on earlier learning theories by adding a social element, arguing that "through the social environment, people receive various modeling influences, motivation and advice about a desirable behavior (Palsadottier, 2013, p. 173). Social cognitive theory emphasizes the importance of social systems on human thought and learning that occurs through vicarious experiences, which is observing or listening to others (Bandura, 1997).

The notion of triadic reciprocity is a central assumption of social cognitive theory. Triadic reciprocity assumes that human action is influenced by three mutually dependent factors: personal characteristics, cognition and behavior, and the social environment. For example, personal characteristics, like efficacy beliefs shape

behavior, and beliefs about one's behavior inform personal factors. Applied to teachers and their growth as professionals, triadic reciprocity assumes that personal characteristics, behavior, and the social context of the school combine to affect teacher learning and performance.

It is the efficacy shaping behaviors that occur within the social context of high functioning CFGs that lend to the idea that the work of CFGs has the potential to lead to greater levels of teacher collective efficacy. Goddard, et. al. (2004) have identified four sources of efficacy-shaping information, critical for the development of both individual and collective efficacy beliefs: mastery experience, vicarious experience, social persuasion, and affective state. The processes and protocols of CFGs provide opportunities for each of these efficacy shaping experiences to occur. In high functioning CFGs teachers experience and share in one another's successes, learn from opportunities to listen and observe one another, provide one another with feedback and encouragement, and support each other's professional and emotional well-being.

In addition to social cognitive theory, theories on the development of trust support the idea that the social context of CFGs has the potential to support the development of faculty trust in colleagues. Forsyth, et. al. (2011) have identified vulnerability, risk, and interdependence as key elements of trust and present five facets of trustworthiness that are commonly described in literature—benevolence, reliability, competence, honesty, and openness. Trust emerges in group settings as members exchange information in ways that distinguish them to be trustworthy. The focused and collaborative nature of CFGs requires teachers to rely on one another to solve common professional dilemmas. This interdependence, combined with the vulnerability and

level of personal risk required to share one's professional shortcoming with a groups requires a certain level of foundational trust to begin with. As the social context in which teachers feel increasingly safe to share and learn from one another develops, it is logical to assume that teachers will feel better positioned to be open and honest with one another and would begin to develop increased confidence in the protected interests of the group and the reliability and competence of the members within in it.

## IV: Methods

The goal of this evaluation was to provide information to inform the work of CFG implementation moving forward, specifically attempting to answer the following evaluation questions:

1. How do teachers in the district perceive the effectiveness of CFGs?
2. Is there a difference in the average CFG effectiveness across schools in the district?
3. Is there a relationship between teacher perceived CFG effectiveness and levels of Faculty Trust in Colleagues and Collective Teacher Efficacy?
4. What is known about the school climate for schools with different levels of teacher perceived CFG effectiveness?
5. In schools with high teacher perception of CFG effectiveness, what has contributed to the successful implementation of CFGs?

### Evaluation Design

The empirical part of this study was based on a process evaluation of the theory of action for Critical Friends Groups as they are being developed in Tulsa Public Schools. A process evaluation is designed to provide evaluation evidence on the implementation and delivery of an intervention, and provide decision makers with the chance to revise and improve interventions to help them have the best chance of accomplishing their intended goals (McDavid & Hawthorne, 2006). Different from effectiveness evaluations that seek to measure observed against intended outcomes, process evaluations examine implementation and development of program components.

This process evaluation examined implementation of CFG processes by analyzing the relationship between effective development and faculty trust in colleagues and collective teacher efficacy. Additionally, this evaluation attempted to identify factors that lead to the successful implementation of CFGs as well as potential barriers to implementation. Data from Tulsa Public Schools annual school capacity reports were used to answer the first four evaluation questions. Principal interviews were used to answer the final evaluation question about the conditions which contribute to successful CFG implementation.

**Data Source**

Quantitative and qualitative data were used in this evaluation. The quantitative data were part of the capacity reports produced by the Oklahoma Center for Education Policy (OCEP) for Tulsa Public Schools. OCEP collected data from elementary, middle, junior high, and high schools within the district. Data were collected from site principals, teachers, parents, and students from 74 schools, and categorized into four school capacity dimensions: organizational capacity, instructional capacity, learning capacity, and home/community capacity.

This evaluation used the faculty level data collected during the 2014-2015 school year. Faculty members from all grades across the district were surveyed and randomly assigned to one of two online surveys, which were distributed by email. The faculty response rate was 80% for those assigned form A and 79% for those assigned form B. The data used focused specifically in the area of instructional capacity. Instructional capacity is based on the availability and use of two interdependent properties: (1) resources in schools that improve teaching effectiveness and (2) social

processes that facilitate professional learning (Adams, 2013). Qualitative data for this research came from interviews with principals from schools in which teachers perceive their CFGs to be effective.

**Measures**

Teacher perceptions of CFGs were measured with a survey designed by OCEP and TPS. The survey measured the degree to which faculty feel that the collaborative team structure in place enables the team to accomplish its tasks and how well teachers feel their team works together (Oklahoma Center for Education Policy, 2015). Survey items with a 6-point Likert response set ranging from strongly disagree (1) to strongly agree (6) make up the survey. Items include:

Our CFG members…

1. Are open and honest about their instructional weaknesses and mistakes
2. Solve important issues during team meetings
3. Challenge one another in order to make informed decisions
4. Are able to come to agreement without compromising individual members' perspectives
5. End meetings with clear and specific understandings of actions to be taken
6. Work as a group equitably to distribute the workload
7. Willingly make sacrifices for the achievement of goals

Responses in the positive reflect a more effective and cooperative CFG. High levels of effectiveness indicate the team structures are coordinated, effective, and consistent with its goals (Oklahoma Center for Education Policy, 2015).

Psychometrics of the survey were assessed with an exploratory factor analysis and reliability test. Principal-axis factoring with no rotation was used as the extraction method. Results of the exploratory factor analysis show that one factor emerged with an Eigen value over 1, and this one factor explained about 86% of the variance among all seven items. Factor loadings were strong, with estimates ranging from .88 to .94. Item correlations were also strong, ranging from .77 to .89. Additionally, item correlations show very strong associations among all survey items. All correlations are above .77. Cronbach's Alpha was used to assess the reliability of the scale by estimating inter-item consistency. Results indicate strong reliability with a Cronbach's Alpha score of .973. The combined psychometrics evidence supports the use of the CFG survey as a measure to capture teacher experiences in the CFG groups. Survey items load strongly on one factor. Additionally, inter-item consistency was excellent. Detailed evidence from the exploratory factor analysis are reported in the results chapter.

Faculty trust in colleagues measures the quality of the relationships among teachers through their perceptions of their colleagues' openness, commitment to students, honesty, competence in the classroom, cooperation with each other, and reliability (Forsyth, Adams, & Hoy, 2011). Teachers surveyed responded to the following 7 items on a 6-point Likert scale, with their responses ranging from strongly disagree (1) to strongly agree (6):

1. Teachers in this school trust each other.
2. Teachers in this school typically look out for each other.
3. Even in difficult situations, teachers in this school can depend on each other.

4. Teachers in this school do their jobs well.
5. Teachers in this school have faith in the integrity of their colleagues.
6. The teachers in this school are open with each other.
7. When teachers in this school tell you something, you can believe them.

Higher scores suggest that teachers perceive their colleagues as being open, honest, reliable, competent, and benevolent in their thoughts and actions (Forsyth, Adams, & Hoy, 2011).

The measure for faculty trust in colleagues is one of three subscales, along with faculty trust in principal and faculty trust in clients, within the Omnibus T-Scale used to measure faculty trust. Past use of the survey in a variety of school contexts has established acceptable validity and reliability. Previous factor analyses have revealed strong predictive validity of the trust measures. Additionally, reliability of the faculty trust in colleagues scale is strong, with a Cronbach's alpha coefficient of .98 (Forsyth, Adams & Hoy, 2011).

Collective teacher efficacy measures the shared perceptions of faculty in a school that the efforts of the faculty as a whole will have a positive effect on students, and whether, as a collective group, they possesses the knowledge, competencies, confidence, and motivation to affect student learning (Bandura, 1993). Teachers surveyed responded to the following 7 items on a 6-point Likert scale, with their responses ranging from strongly disagree (1) to strongly agree (6):

1. Teachers in this school are able to get through to the most difficult students.
2. Teachers here are confident they can motivate their students.
3. Teacher here never give up, even if a child doesn't want to learn.

4. Teachers here have the skills needed to produce meaningful student learning.
5. Teachers in this school believe that every child can learn.
6. Teachers in this school have the skills to deal with student disciplinary problems.
7. Teachers here are able to meet the specific learning needs of each child.

Higher collective efficacy indicates that the faculty perceives the collective ability of the faculty as having a stronger influence on learning than other factors, such as the students' social context (Goddard, et. al., 2000).

The collective efficacy measure is part of a collective efficacy scale. Past use of the survey has established acceptable validity and reliability. Previous factor analyses have revealed strong predictive validity of the efficacy measure, with a single item explaining 58% of the variance among items. Additionally, reliability of the collective efficacy scale is strong, with a Cronbach's alpha score of .96 (Goddard, Hoy, & Hoy, 2000).

**Analysis**

This process evaluation was designed to provide evidence to answer each of the evaluation questions. Each question called for a different analytical technique. The first research question—How do teachers in the district perceive the effectiveness of CFGs?—was addressed with descriptive data from the teachers' responses to the seven survey items about their CFG experiences. The item analysis provided information on the percent of teachers who responded favorably (strongly agree or agree), were ambivalent to (somewhat agree or somewhat disagree), or responded negatively (disagree or strongly disagree) to each question.

The second evaluation question—Is there a difference in average CFG effectiveness across schools in the district?—sought to determine if there was a difference in average CGF effectiveness scores across schools in the district. This question was addressed through data presented in a histogram and scatterplot that showed the distribution of average CFG effectiveness scores across the seventy-four schools that were surveyed. Categories of effectiveness were determined, with a score of 4.6 or higher considered effective, a score from 4.1-4.5 considered moderately effective, and a score of 4.0 or lower considered ineffective.

The third evaluation question –Is there a relationship between CFG effectiveness and Faculty Trust in Colleagues and Collective Teacher Efficacy?—sought to determine if there was a relationship between teachers' perceived CFG effectiveness, and levels of faculty trust in colleagues and collective teacher efficacy. This question was first addressed through bi-variate correlation data. The bivariate correlations were estimated to analyze the relationship between teachers' perceived effectiveness of CFGs and faculty trust in colleagues, collective teacher efficacy, and teacher perception of the transformational leadership behaviors of their school leader.

Multiple regression analyses were performed so that additional schools conditions—free and reduced lunch status, percent Caucasian, and principal transformational leadership behaviors—could be included as control variables in the models. Assumptions for multiple regression analyses were met with empirical evidence presented in Appendices A and B. First, appendix A graphs predicted values against the outcome variable to test the linearity assumption. Data show the variables maintain a linear relationship. Second, appendix B graphs the predicted values against

residuals to test for homogeneity of variance. Results show no pattern in the relationship, suggesting heteroscedastic data is not a problem. Finally, data were aggregated to the school level to guard against violation of independence of teacher observations within schools.

The fourth evaluation question—What do we know about the school climate for schools with different levels of CFG effectiveness?—sought to understand the climates of schools with different levels of CFG effectiveness. This question was addressed with descriptive data showing differences in school level variables associated with teacher relations, academic optimism, and leadership behaviors. In addition to faculty trust in colleagues, and collective teacher efficacy, variables of teacher workplace isolation, teacher academic emphasis, faculty trust in students, transformative leadership behaviors, enabling school structure, and faculty trust in principals were analyzed to determine average teacher response scores within each of the CFG effectiveness bands.

The fifth and final evaluation question—In schools with higher teacher perception of CFG effectiveness, what has contributed to the successful implementation of CFGs?—sought to understand what has contributed to successful CFG implementation in schools with higher teacher perception of their effectiveness. This research question was addressed with qualitative data from principal interviews regarding the implementation of CFGs their schools, including their reflections on the factors that contribute to, or limit successful implementation. Principals responded to the following interview questions:

1. What is your overall impression of Critical Friends Groups?

2. How did you approach the implementation and development of CFGs in your building?
3. How have you helped teachers understand the functions/purpose of CFGs?
4. What do you see has the most important element of effective CFG implementation?
5. What do you see as the greatest challenge to CFG implementation?
6. What additional thoughts or insights can you share around the implementation and development of CFGs?

Three principal interview responses were analyzed. The principals selected included one elementary principal, one middle school principal, and one high school principal, all of whom led buildings with average teacher CFG perception scores in the effective range. An inductive analysis of interview responses was used to explore factors that contribute to the successful implementation of CFGs. An inductive analysis qualitative research approach used to condense raw textual data in to summary format, and to identify patterns and themes that emerge (Miles & Huberman, 1994). An initial full review of interview transcripts was conducted. Transcripts were then summarized for the purpose of identifying emerging themes among responses, and coded to identify the common ideas that appeared. Finally, the responses were organized and are presented according to the key themes identified.

**Threats to Validity**

The concept of validity refers to the relevance of evidence for the question being investigated, or the appropriateness of a conclusion, given available evidence (Vogt, 2007). In this case, validity depends on the accuracy of conclusions drawn from the

process evaluation. The primary threats to validity of the findings include history, mortality, and ambiguous temporal sequence in the cause and effect variable. It is possible that external events, coinciding with the implementation of CFGs, could influence the measured outcomes of faculty trust in colleagues and collective teacher efficacy. For example, the implementation of other initiatives that have the potential to affect teacher learning and interactions, or personal relationships established among teachers outside of the context of CFG, could influence the development of trust and efficacy. It is true that other contextual factors could intervene in the CFG and trust and CFG and collective efficacy relationships. Steps were taken to control for confounding variables in the model, but the plausible effects of unmeasured conditions cannot be ruled out entirely.

Mortality was also a threat, as teacher turnover in many schools may be high. Mortality occurs if participants drop out of a study or evaluation before completion. It is possible that teachers leave their schools or the district over the course of CFG implementation, in which case their perceptions the effectiveness of CFG implementation would not be available in the final survey.

Finally, it is possible that the key intended outcome variables of faculty trust in colleagues and collective teacher efficacy cannot be clearly linked to implementation of CFGs, or that in fact, increased faculty trust in colleagues and collective teacher efficacy caused by other factors, lead teachers to report greater perceptions of CFG effectiveness (McDavid & Hawthorne, 2006).

**Limitations**

There are two key limitations to the research methods used in this process evaluation. The first limitation involves the interview sample size used for the qualitative portion of the study. Only three principals—one elementary, one middle, and one high school—were interviewed. This limitation was, in part, due to the fact that there was only one high school in the district with an average teacher CFG perception score in the effective range. Additionally, there were a limited number of principals still in the district at the time of the interviews who were building leaders in schools with effective CFGs during the implementation year. Additional interviews of principals of schools in which teachers perceive their CFGs to be effective would need to be conducted in order to confirm key findings, as well as interviews with principals in schools with ineffective CFGs to contrast leadership approaches to implementation.

An additional limitation involves the data analysis for evaluation question four, regarding the additional school climate variables associated with effective CFGs. The data presented is limited to descriptive data of the average scores for each variable across schools in each of the CFG effectiveness range. Statistical tests were performed to determine if mean differences were more likely to be the result of chance or of actual differences in teacher shared perceptions. The research design behind the evidence, however, does support attributional claims about CFGs nor does the evidence suggest reasons for the differences across effectiveness levels. Additional research is needed to better understand why certain conditions of school climate were higher in schools with effective CFGs.

## V: Results

The results section provides evidence related to the evaluation questions. Results are organized by the different questions, with evidence on the psychometrics of the CFG survey presented first. Item analyses of teacher survey responses about their perceived effectiveness of CFGs, along with descriptive statistics are presented for the first evaluation question. The second research question is addressed by presenting a histogram and scatter plot to show the distribution of CFG effectiveness scores. Correlation data are presented for the third research question about the relationship between CFG effectiveness and Faculty Trust in Colleagues and Teacher Collective Efficacy, followed by additional descriptive data to analyze additional school factors relating to research question four. The results section concludes with qualitative data presented for the fifth research question, regarding the factors that contribute to successful CFG implementation.

### Psychometric Evidence

An analysis was conducted to test the structural validity and reliability of the survey items used to measure teachers' perception of the effectiveness of CFGs. For structural validity, results of the exploratory factor analysis (see Table 1) show that one factor emerged with an Eigen value over 1, and this one factor explained about 86% of the variance among all seven items.

Table 2 reports factor loadings for the single factor. As seen in the table, all loadings were strong, with estimates ranging from .88 to .94. Item correlations were also strong, ranging from .77 to .89. Additionally, item correlations (Table 3) show very strong associations among all survey items. All correlations are above .77.

Cronbach's Alpha was used to assess the reliability of the scale by estimating inter-item consistency. Results indicate strong reliability with a Cronbach's Alpha score of .973.

The combined psychometrics evidence supports the use of the CFG survey as a measure to capture teacher experiences in the CFG groups. Survey items load strongly on one factor. Additionally, inter-item consistency was excellent.

*Table 1*

*Total Variance Explained*

| Factor | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 6.01 | 86.26 | 86.26 | 5.88 | 83.99 | 83.99 |
| 2 | .30 | 4.27 | 90.53 | | | |
| 3 | .20 | 2.80 | 93.34 | | | |
| 4 | .14 | 1.93 | 95.27 | | | |
| 5 | .13 | 1.83 | 97.10 | | | |
| 6 | .11 | 1.62 | 98.72 | | | |
| 7 | .09 | 1.28 | 100.00 | | | |

Extraction Method: Principal Axis Factoring.

*Table 2*

*Factor Matrix*[a]

| | Factor Loadings |
|---|---|
| | 1 |
| Our CFG members are open and honest about their instructional weaknesses and mistakes. | .88 |
| Our CFG members solve important issues during team meetings. | .92 |
| Our CFG members challenge one another in order to make informed decisions. | .94 |
| Our CFG members are able to come to agreement without compromising individual member perspectives. | .93 |
| Our CFG members end meetings with clear and specific understanding of actions to be taken. | .93 |
| Our CFG members work as a group equitable to distribute the workload. | .91 |
| Our CFG members willingly make sacrifices for the achievement of our goals. | .92 |

Extraction Method: Principal Axis Factoring
a. 1 factors extracted. 3 iterations required.

*Table 3*

*CFG Effectiveness Survey Item Correlation Matrix*

| Survey Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1 | 1.000 | .838 | .850 | .805 | .791 | .774 | .791 |
| 2 | | 1.000 | .897 | .829 | .874 | .797 | .814 |
| 3 | | | 1.00 | .857 | .859 | .831 | .844 |
| 4 | | | | 1.000 | .861 | .861 | .870 |
| 5 | | | | | 1.000 | .854 | .848 |
| 6 | | | | | | 1.000 | .883 |
| 7 | | | | | | | 1.000 |

**EQ1. How do teachers in the district perceive the effectiveness of CFGs?**

An item analysis of the teacher survey was used to address the above research question. Descriptive bar graphs for each survey item report the percentage of teachers responding to each response category on a scale of 1 (strongly disagree) to 6 (strongly agree). This evidence describes general teacher perceptions of different CFG factors.

As seen in figure 2, 51% of teachers responded favorably to the survey item—Our CFG members are open and honest about their instructional weaknesses and mistakes—with 40% of teachers stating they agree and 11% stating they strongly agree with the statement. 32% of teachers provided an ambivalent response of somewhat agree. 18% of teachers provided a negative response of somewhat disagree (9%), disagree (5%), or strongly disagree (4%). The most frequent response to this question

from teachers was agree (40%), with the least frequent response being strongly disagree (4%).

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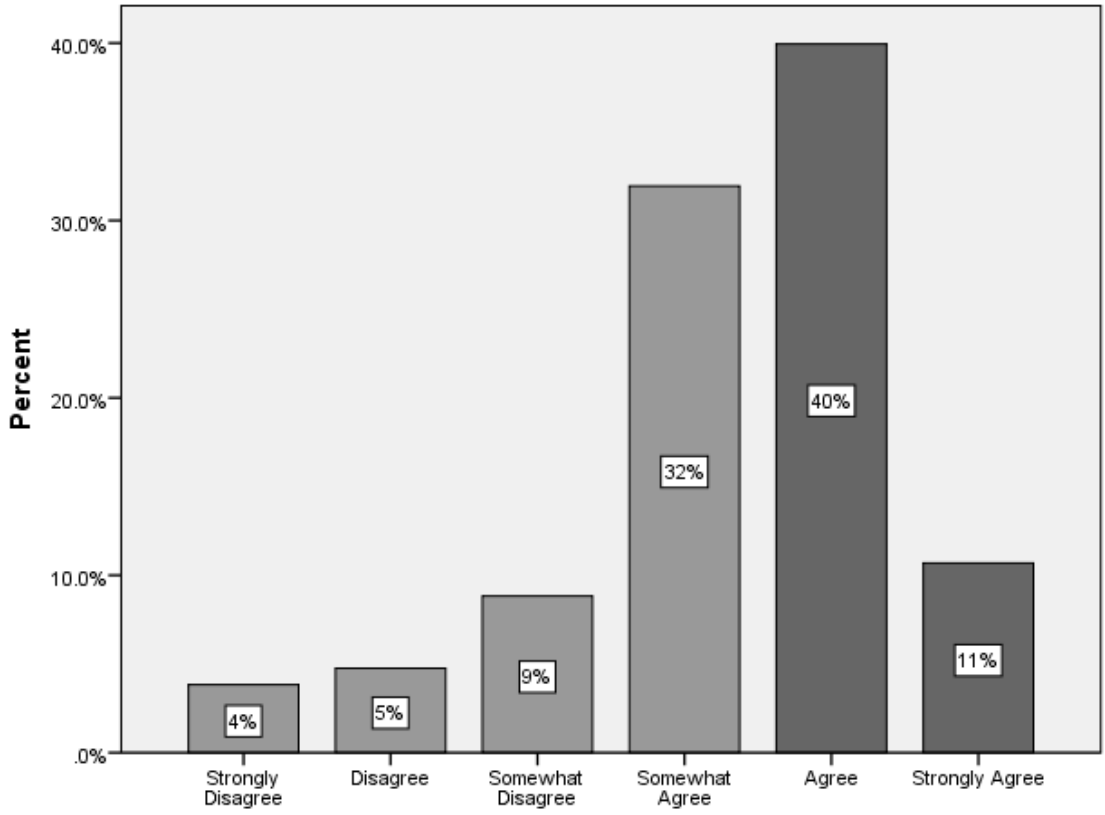


*Figure 2*

*Our CFG members are open and honest about their instructional weaknesses and mistakes.*

As seen in figure 3, 48% of teachers responded favorably to the second survey item—Our CFG members solve important issues during team meetings—with 37% stating they agree and 11% stating they strongly agree with the statement. 30% of teachers provided an ambivalent response of somewhat agree. 22% of teachers provided a negative response of somewhat disagree (10%), disagree (7%), or strongly

disagree (5%). The most frequent response to this question from teachers was agree (37%), with the least frequent response being strongly disagree (5%).

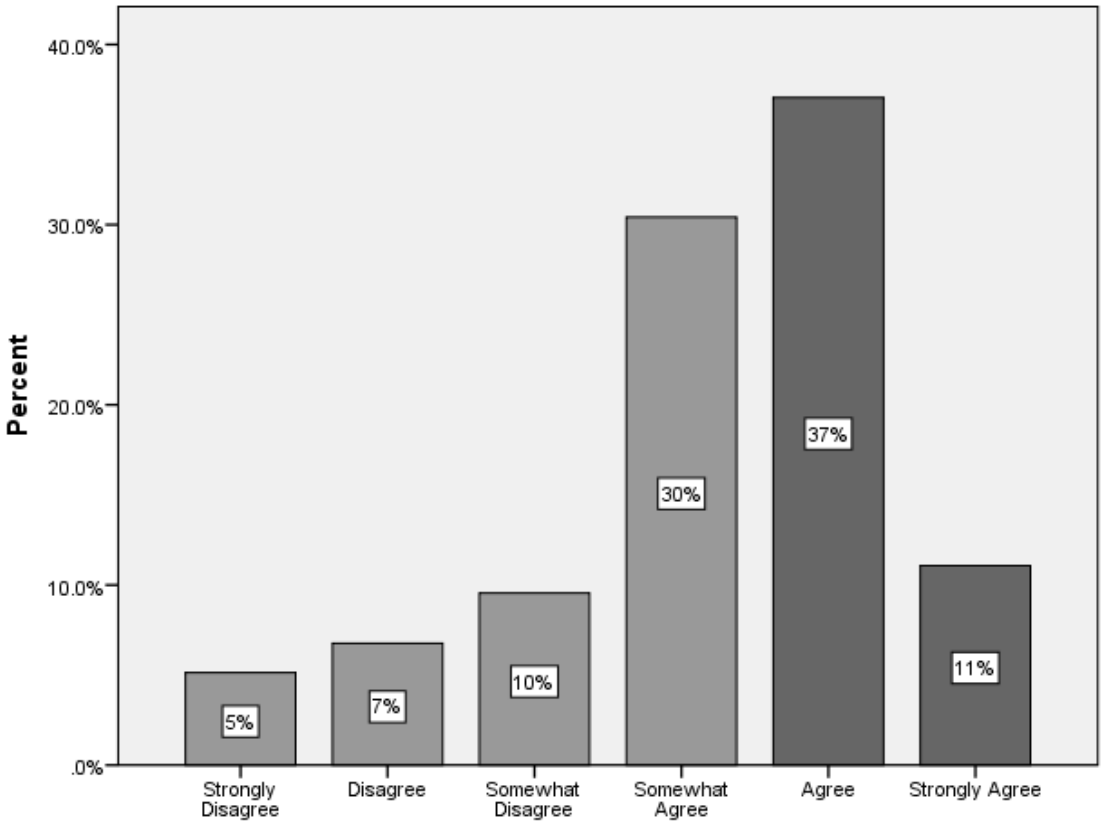


*Figure 3*

*Our CFG members solve important issues during team meetings.*

As seen in figure 4, 51% of teachers responded favorably to the third survey item—Our CFG members challenge one another in order to make informed decisions—with 40% stating they agree and 11% stating they strongly agree with the statement. 30% of teachers provided an ambivalent response of somewhat agree. 20% of teachers provided a negative response of somewhat disagree (10%), disagree (6%), or strongly

disagree (4%). The most frequent response to this question from teachers was agree (40%), with the least frequent response being strongly disagree (4%).

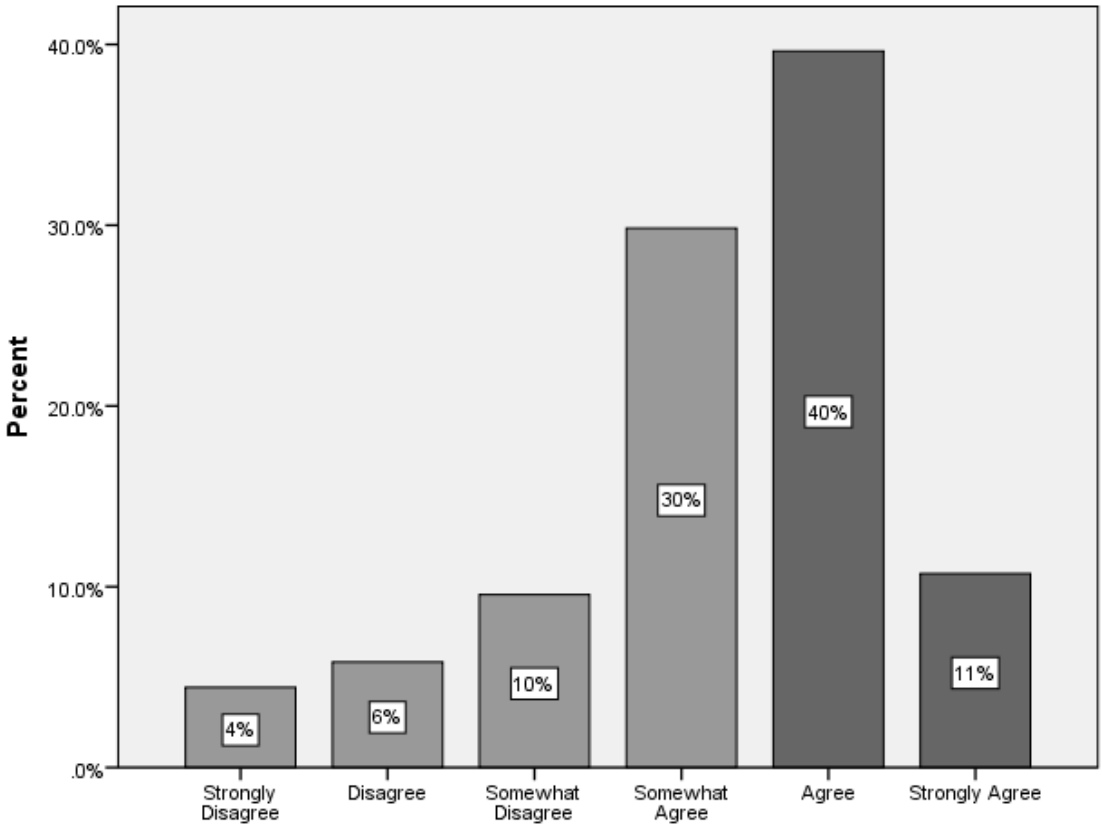


*Figure 4*

*Our CFG members challenge one another in order to make informed decisions.*

As seen in figure 5, 54% of teachers responded favorably to the fourth survey item—Our CFG members are able to come to an agreement without compromising individual member perspectives—with 41% stating they agree and 13% stating they strongly agree with the statement. 29% of teachers provided an ambivalent response of somewhat agree. 17% of teachers provided a negative response of somewhat disagree (8%), disagree (5%), or strongly disagree (4%). The most frequent response to this question from teachers was agree (41%), with the least frequent response being strongly disagree (4%).

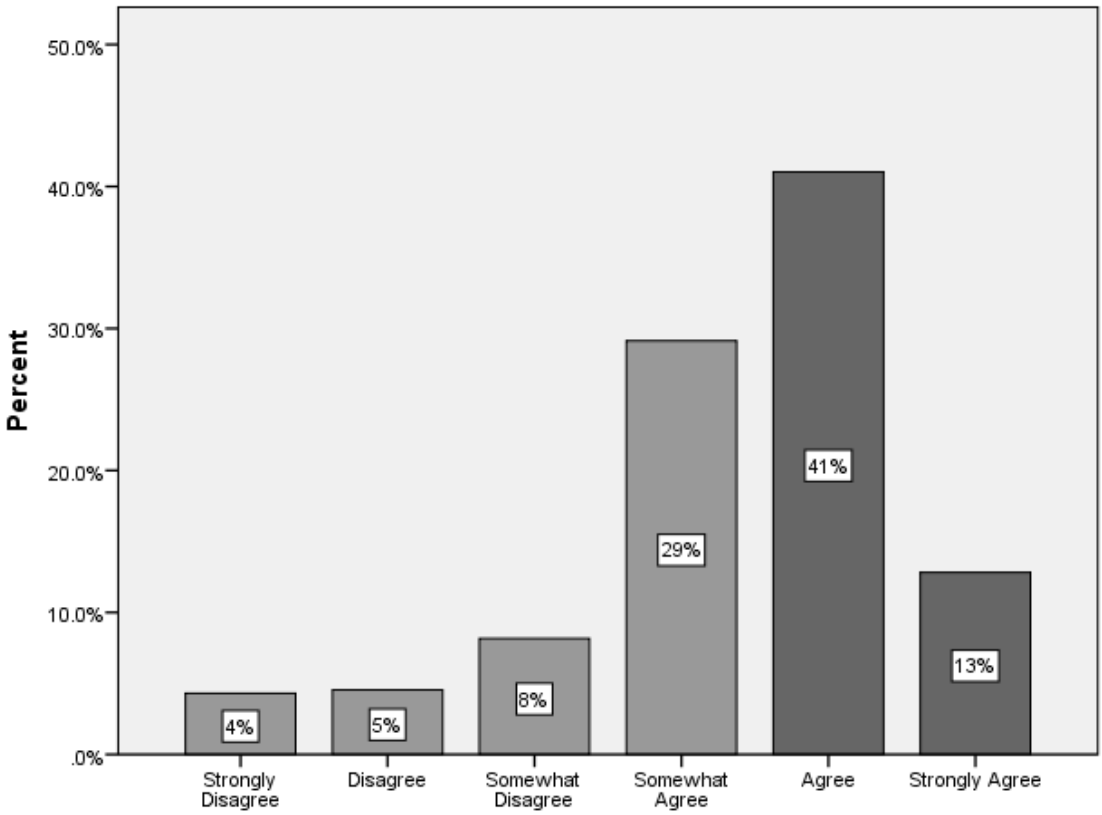


*Figure 5*

*Our CFG members are able to come to an agreement without compromising individual member perspectives.*

As seen in figure 6, 52% of teachers responded favorably to the fifth survey item—Our CFG members end meetings with clear and specific understanding of actions to be taken—with 39% stating they agree and 13% stating they strongly agree with the statement. 28% of teachers provided an ambivalent response of somewhat agree. 20% of teachers provided a negative response of somewhat disagree (10%), disagree (5%), or strongly disagree (5%). The most frequent response to this question from teachers was agree (39%), with the least frequent response tied between disagree and strongly disagree (both 5%).

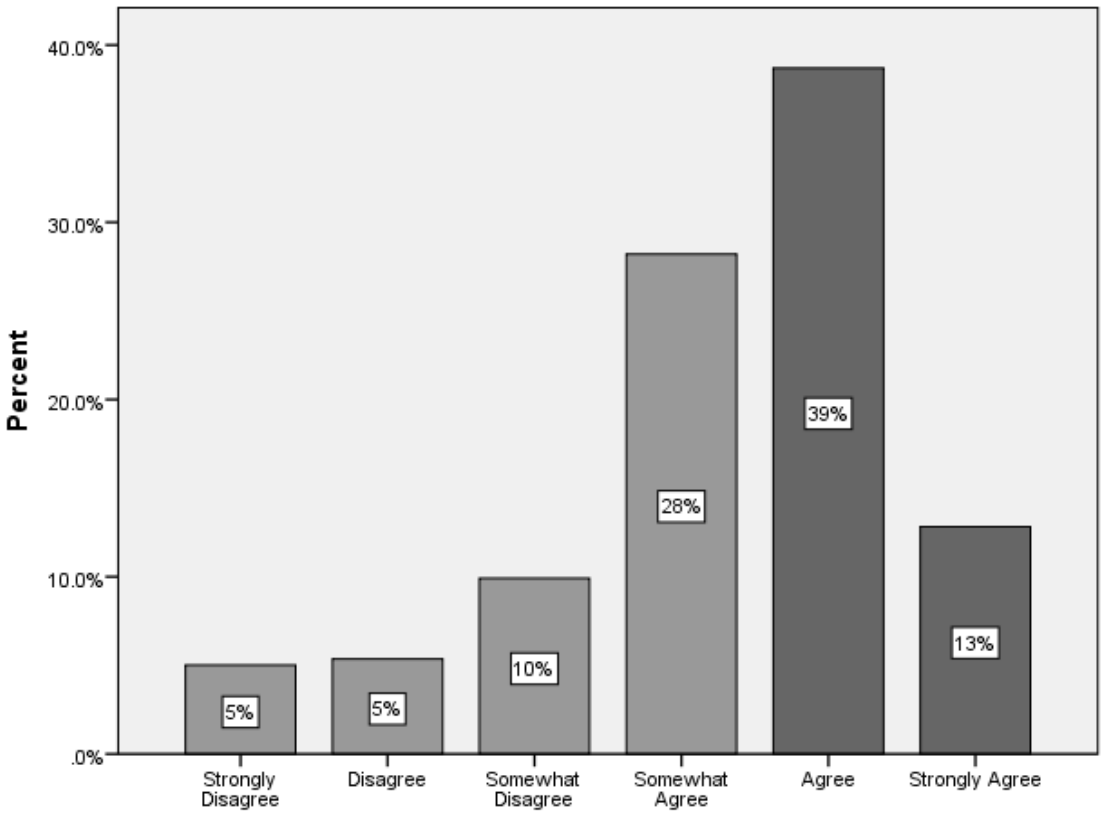


*Figure 6*

*Our CFG members end meetings with clear and specific understanding of actions to be taken.*

As seen in figure 7, 52% of teachers responded favorably to the sixth survey item—Our CFG members work as a group equitably to distribute the workload—with 40% stating they agree and 12% stating they strongly agree with the statement. 30% of teachers provided an ambivalent response of somewhat agree. 18% of teachers provided a negative response of somewhat disagree (8%), disagree (5%), or strongly disagree (5%). The most frequent response to this question from teachers was agree (40%), with the least frequent response tied between disagree and strongly disagree (both 5%).

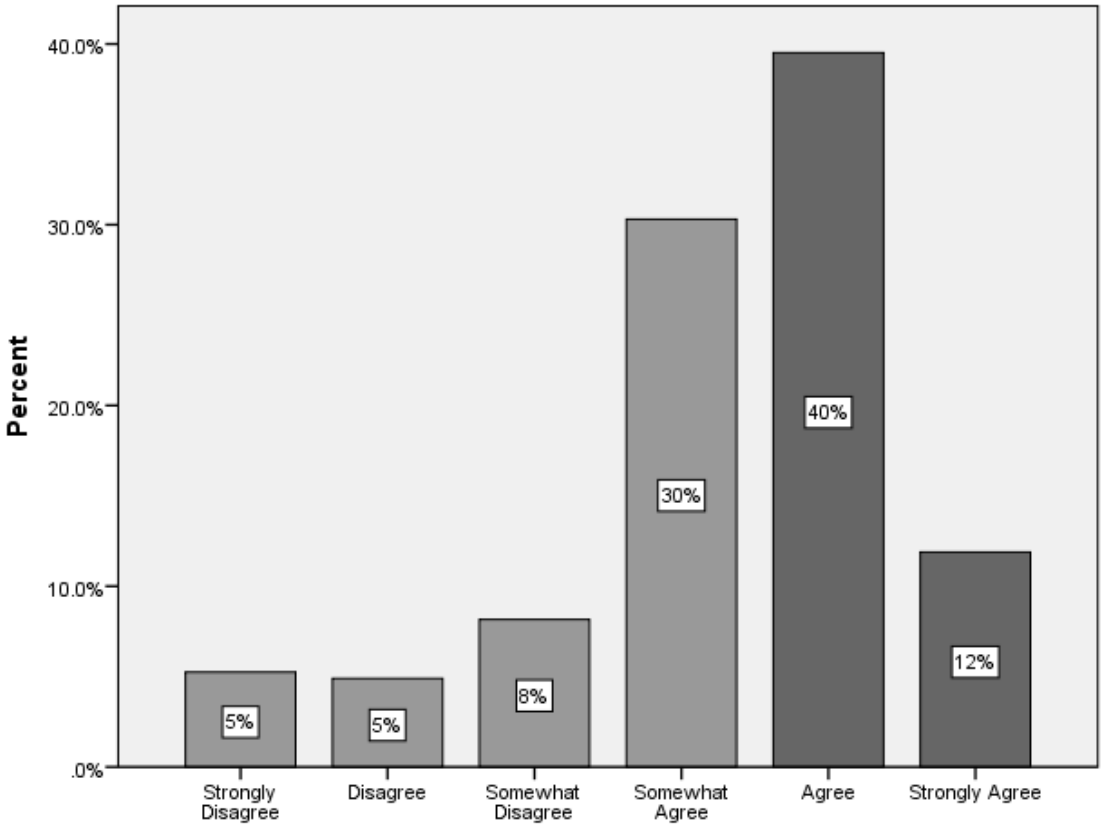


*Figure 7*

*Our CFG members work as a group equitably to distribute the workload.*

As seen in figure 8, 54% of teachers responded favorably to the seventh and final survey item—Our CFG members willingly make sacrifices for the achievement of our goals—with 39% stating they agree and 15% stating they strongly agree with the statement. 31% of teachers provided an ambivalent response of somewhat agree. 16% of teachers provided a negative response of somewhat disagree (7%), disagree (4%), or strongly disagree (5%). The most frequent response to this question from teachers was agree (39%), with the least frequent response being disagree (4%).

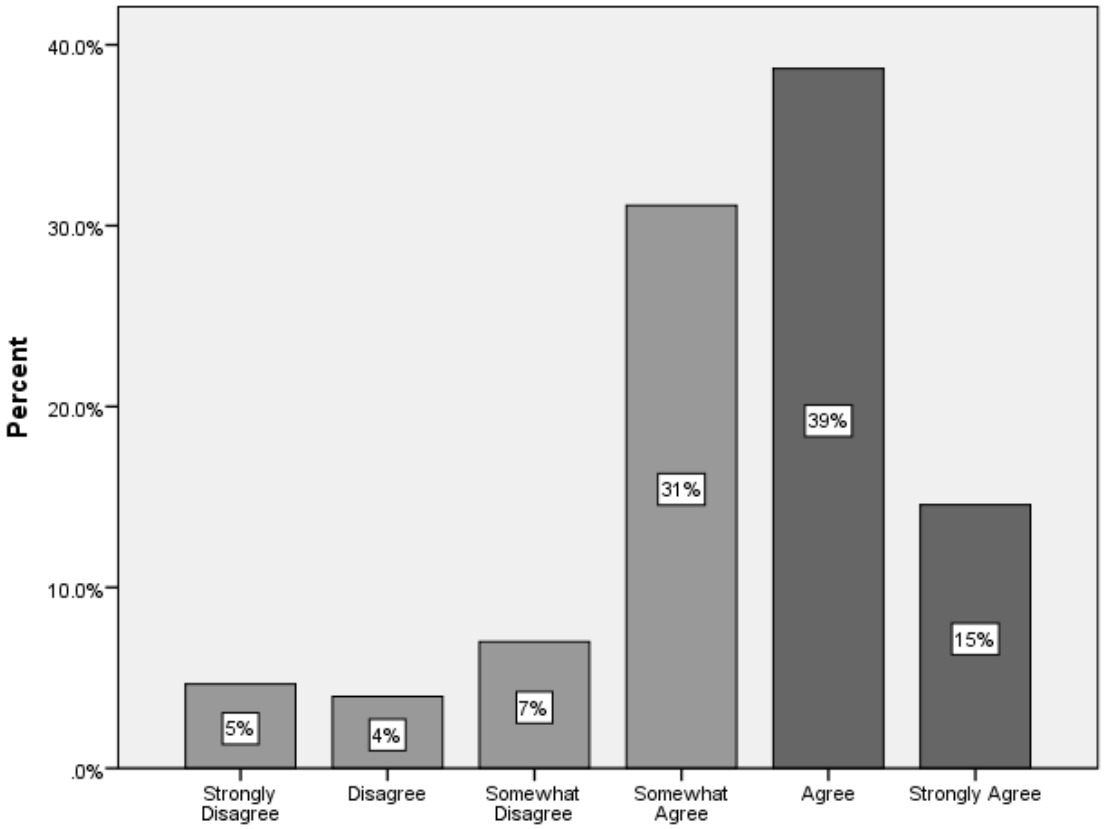


*Figure 8*

*Our CFG members willingly make sacrifices for the achievement of our goals.*

In summary, the item analysis revealed comparable responses to all survey items. Approximately 50% of teachers responded favorably to the questions with responses in the strongly agree (11-15%) or agree (37-41%) categories. Around 30% of teachers were ambivalent about different features of CFGs, with responses in the somewhat agree (28-32%) category. Approximately 20% of teachers had responses in the somewhat disagree (7-10%), disagree (4-7%), or strongly disagree (4-5%) categories, representing negative experiences with CFGs.

Favorable responses of agree or strongly agree on the seven survey items ranged from 48% to 54%. For purposes of better understanding teacher overall perceptions of CFGs, these response rates were compared to an ideal favorable response rate of 80%.

While none of the survey items received a favorable response rate close to 80% when only considering those who responded agree or strongly agree, the favorable response rate improved when considering the teachers who responded somewhat agree. Although somewhat ambivalent, a response of somewhat agree is on the favorable side of the Likert scale, indicating the teacher's perception of their CFG is more positive than negative. When considering teachers who responded somewhat agree, the favorable responses rates range from 78% to 85%, nearly meeting and in several cases exceeding the ideal of 80%.

With positive responses only varying by 6-7%, it is clear that no one aspect of CFGs stands out as being significantly stronger or weaker than another. For effective CFGs, all elements seem to come together to create overall favorable experiences for teachers. That is, when teachers feel favorably about one element of their CFG, they tend to respond favorably to questions about other elements of their CFG.

**EQ2. Is there a difference in average CFG effectiveness across schools in the district?**

The descriptive graphs are helpful for describing teacher perceptions of various CFG features, but not as useful for determining if the effectiveness of CFGs varies by school. This second research question examines differences in CFGs across schools within the district.

Teacher responses to the CFG effectiveness survey were averaged to determine school level CFG effectiveness scores. The following histogram (figure 9) presents the distribution of average CFG effectiveness scores for seventy-four schools across the district. There was a roughly normal distribution of average CFG effectiveness scores,

with a mean of 4.3 and a standard deviation of .45. Average school scores ranged from approximately 3.3 to 5.5.

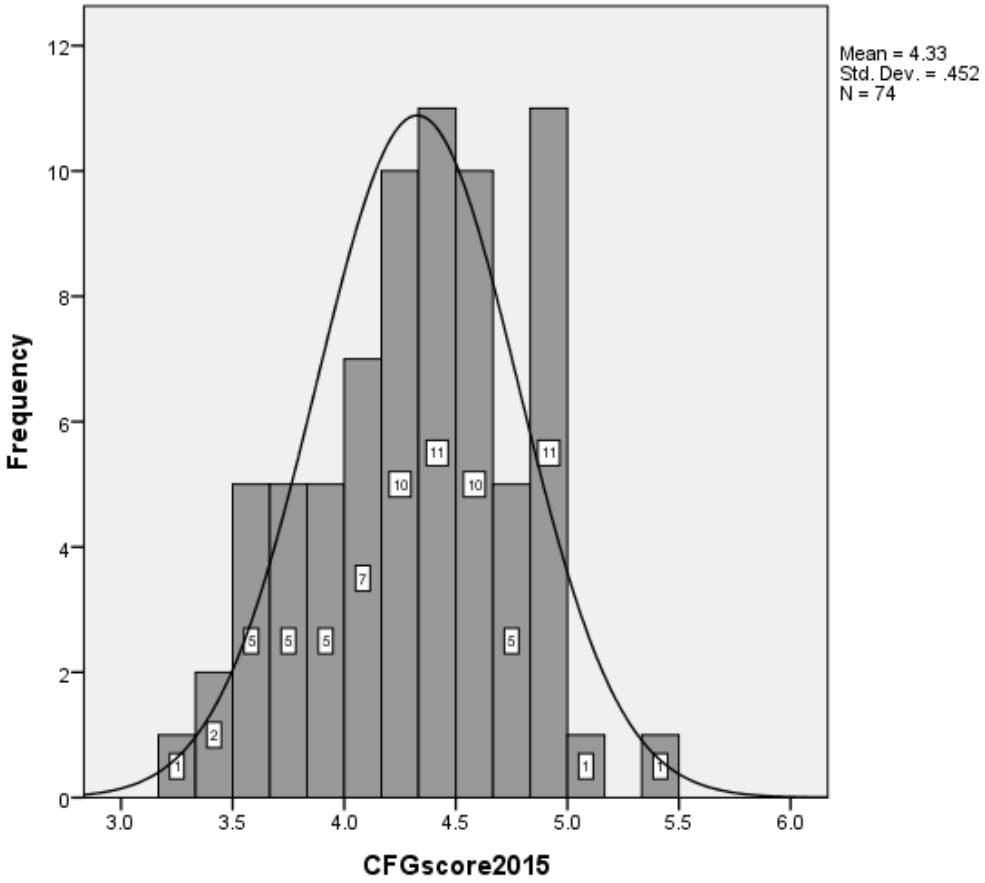


*Figure 9*

*Distribution of Average CFG Effectiveness Scores*

The following scatterplot (figure 10) shows the distribution of CFG effectiveness scores for the seventy-four surveyed sites across the district by school code. The solid line represents the average CFG effectiveness score across all sites. The top dotted line represents an average CFG effectiveness score of 4.6. A score of 4.6 or greater is considered effective for this evaluation. Approximately 22 of the 74 schools surveyed had an average score greater than 4.6. The bottom dotted line

represents an average CFG effectiveness score of 4.0. A score of 4.0 or less is considered ineffective. Approximately 17 of the 74 schools surveyed had an average score of 4.0 or less. Approximately 34 schools had an average CFG effectiveness score between 4.1 and 4.5, considered to be moderately effective.

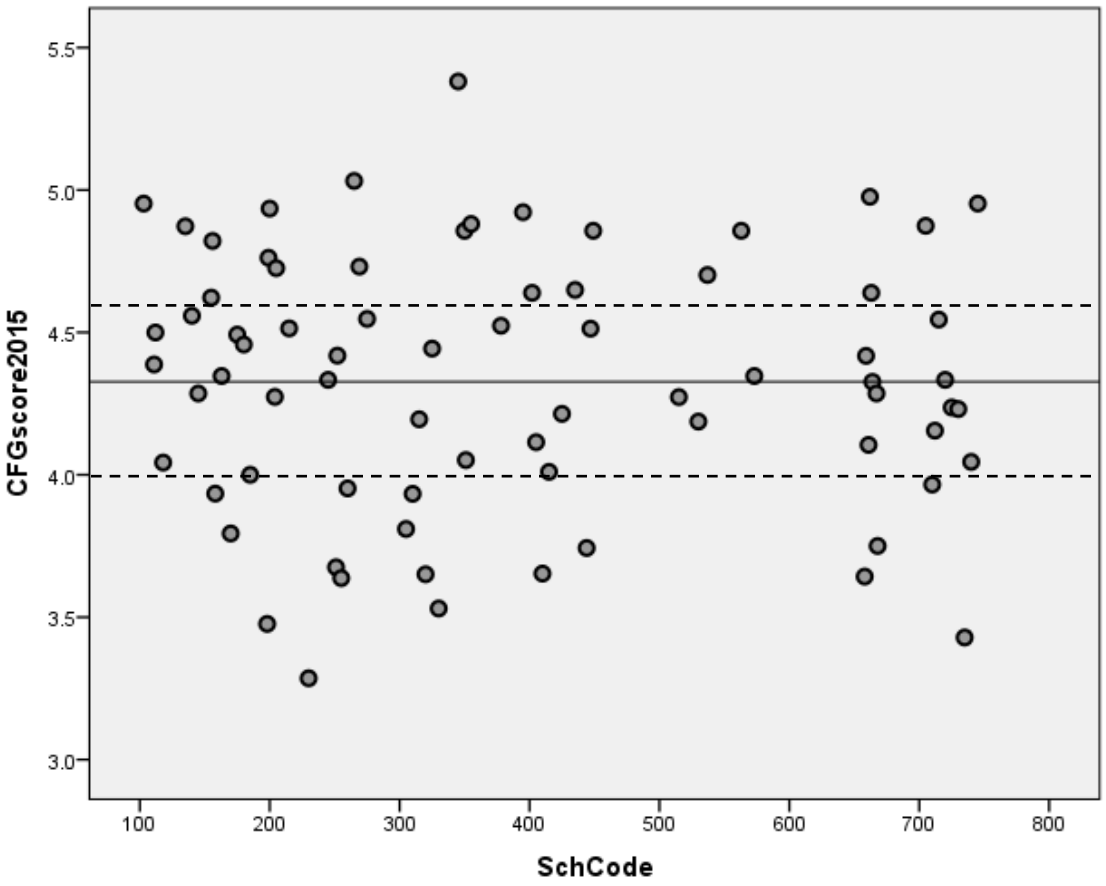


*Figure 10*

*Distribution of Average CFG Scores by School Code*

Results of an unconditional random effects ANOVA lends additional support that CFG effectiveness varies across schools. Table 4 reports statistically significant variance attributed to school differences. Approximately 32% of the variance in CGF effectiveness was at the school level.

*Table 4.*

*Final Estimation of Variance Components for CFG Effectiveness*

| Random Effect | Standard Deviation | Variance Component | *d.f.* | $\chi^2$ | *p*-value |
|---|---|---|---|---|---|
| INTRCPT1, $u_0$ | 0.24353 | 0.5931 | 73 | 113.44404 | 0.000 |
| level-1, *r* | 1.10906 | .23001 | | | |
| ICC = .32 | | | | | |

In summary, teacher perception of the effectiveness CFG varies from site to site within the district, with average scores distributed as expected. Roughly half (46%) of the 74 schools surveyed fell in the middle range of moderately effective. The remaining half of school were distributed relatively evenly between effective (30%) and ineffective (23%).

**EQ3. Is there a relationship between CFG effectiveness and Faculty Trust in Colleagues and Teacher Collective Efficacy?**

Bi-variate correlations were estimated to analyze the relationships between the effectiveness of CFGs and faculty trust in colleagues and collective teacher efficacy at the school level. Results revealed a statistically significant, positive correlation between CFG effectiveness and both faculty trust in colleagues ($r=.34$, $p<.01$) and collective teacher efficacy ($r=.58$, $p<.01$). As teacher perceptions of CFG effectiveness increased so did faculty trust in colleagues and collective teacher efficacy. Approximately 12% of the variance in faculty trust in colleagues was accounted for by

CFG effectiveness, and approximately 34% of the variance in collective teacher efficacy was accounted for by CFG effectiveness.

In addition to correlations to analyze the relationships between CFG effectiveness and faculty trust in colleagues and collective teacher efficacy, additional correlations were estimated to analyze the relationship between CFG effectiveness and teachers' perception of transformational leadership behaviors of their school leaders. Results revealed a statistically significant correlation between CFG effectiveness and transformational leadership behaviors ($r=.52$, $p<.01$). As teacher perception of CFG effectiveness increased so did their perception of the transformational leadership behaviors of their school leader. Approximately 27% of the variance in transformational leadership behaviors was accounted for by CFG effectiveness.

*Table 5*

*Correlations*

| Variable | CFG Effectiveness | Faculty Trust in Colleagues | Teacher Collective Efficacy | Transformational Leadership Behaviors |
|---|---|---|---|---|
| CFG Effectiveness | | .34** | .58** | .52** |
| Faculty Trust in Colleagues | | | .44** | .29** |
| Teacher Collective Efficacy | | | | .43** |
| Transformational Leadership Behaviors | | | | |

**Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Further analysis was conducted to test the relationship of CFG effectiveness on faculty trust in colleagues and collective teacher efficacy, after controlling for students' free and reduced lunch status, the percent of Caucasian students within the school, and teachers' perception of transformational leadership behaviors of the principal. As seen in Table 6, free and reduced lunch rate, percent Caucasian, transformational leadership behaviors, and CFG effectiveness combined to explain 16% of the variance in faculty trust in colleagues. Of these predictor variables, CFG effectiveness was the only school condition with a statistically significant relationship with faculty trust in colleagues ($\beta$=.12, $p<.01$). A one standard deviation increase in a school's CFG effectiveness score was associated with a .12 standard deviation increase in faculty trust in colleagues. CFG effectiveness explained approximately 1% of the variance in faculty trust in colleagues after controlling for free and reduced lunch rate, percent Caucasian, and transformational leadership behaviors.

*Table 6*

*CFG Effect on Faculty Trust in Colleagues controlling for Free and Reduced Lunch, Percent Caucasian, and Transformational Leadership Behaviors*

| School Predictor | Unstandardized Coefficient | Standardized Coefficient | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|
| Free/Reduced Lunch | .00 (.00) | -.07 | -.001 | .00 |
| Percent Caucasian | .00 (.00) | .18 | -.59 | .94 |
| Transformational Leadership Behaviors | .09 (.09) | .12 | -.01 | -.46 |
| CFG Effectiveness | .22 | .12** | .08 | .49 |

$R^2$=.16

Table 7 presents the results of the regression for collective teacher efficacy. Free and reduced lunch rate, percent Caucasian, transformational leadership behaviors, and CFG effectiveness combine to explain 38% of the variance in collective teacher efficacy. Of these predictor variables, CFG effectiveness was the only school condition with a statistically significant relationship with collective teacher efficacy ($\beta$=.49, $p<.01$). A one standard deviation increase in a school's CFG effectiveness score was associated with a .49 standard deviation increase in collective teacher efficacy. CFG effectiveness explained approximately 24% of the variance in collective teacher efficacy after controlling for free and reduced lunch rate, percent Caucasian, and transformational leadership behaviors.

*Table 7*

*CFG Effect on Collective Teacher Efficacy controlling for Free and Reduced Lunch, Percent Caucasian, and Transformational Leadership Behaviors*

| School Predictor | Unstandardized Coefficient | Standardized Coefficient | 95% Confidence Interval Lower | Upper |
|---|---|---|---|---|
| Free/Reduced Lunch | -.00 (.00) | -.06 | -.001 | .00 |
| Percent Caucasian | .00 (.00) | .12 | -.59 | .79 |
| Transformational Leadership Behaviors | .11 (.08) | .15 | -.06 | -.28 |
| CFG Effectiveness | .47 (.11) | .49** | .33 | .69 |

$R^2$=.38

In summary, the results from the above analyses support the theory of action for this research. CFGs effectiveness was, in fact, positively correlated to both faculty trust in colleagues, and teacher collective efficacy. As teachers' perception of the effectiveness of their CFGs increased, so did their levels of trust in colleagues and

perceived collective efficacy. These relationships hold when controlling for differences in school composite. After controlling for free/reduced lunch, percent Caucasian, and transformative leadership behaviors, CFG effectiveness was the only school condition with a statistically significant relationship to faculty trust in colleagues and teacher collective efficacy. The strongest relationship was with collective teacher efficacy.

**EQ4. What do we know about the school climate for schools with different levels of CFG effectiveness?**

In order to assess additional school climate variables for schools with different levels of CFG effectiveness, schools were categorized by average CFG effectiveness score into one of three categories—effective (mean CFG score $\geq 4.6$), moderate (mean CFG score between 4.1 and 4.5), or ineffective (mean CFG score $\leq 4.0$). Results of a One-Way ANOVA with a Tukey post-hoc (see Appendix C) show that the there is a statistically significant difference CFG effectiveness across the three groupings ($F= 202$, 2 df, $p>001$). Statistically significant difference existed between effective and ineffective groups, effective and moderately effective groups, and moderate effective and ineffective, suggesting three distinct levels of CFG effectiveness.

Conditions related to teacher professional climate, instructional environment, and school leadership were graphed to determine if there were differences in social conditions across the three levels of CFG implementation. Variables relating to professional climate included faculty trust in colleagues and teacher workplace isolation. Instructional environment variables included collective teacher efficacy, teacher academic emphasis, and faculty trust in students. Finally, variables relating to

school leadership included transformational leadership behaviors, enabling school structure, and faculty trust in principals.

As reported in figure 11, faculty trust in colleagues was higher in schools with more favorable CFGs. Schools identified with ineffective CFGs had a mean faculty trust score of approximately 4.5, while schools with moderate and effective CFGs had mean faculty trust scores of 4.7 and 4.8 respectively. Results of a One-Way ANOVA (Appendix D) indicate that group differences in faculty trust were statistically significant between the effective and ineffective CFG schools but not between moderately effective and ineffective.

Workplace isolation also differed by CFG level. The average teacher workplace isolation score in schools with ineffective CFG scores was approximately 2.5, with average teacher workplace isolation scores for moderate and effective CFGs dropping to 2.1 and 2.0 respectively. So, teachers felt more isolated in schools with lower CFG perception. Results of a One-Way ANOVA (Appendix E) indicate that differences in teacher workplace isolation were statistically significant between all effective and moderately effective schools, effective and ineffective schools, and moderately effective and ineffective schools.

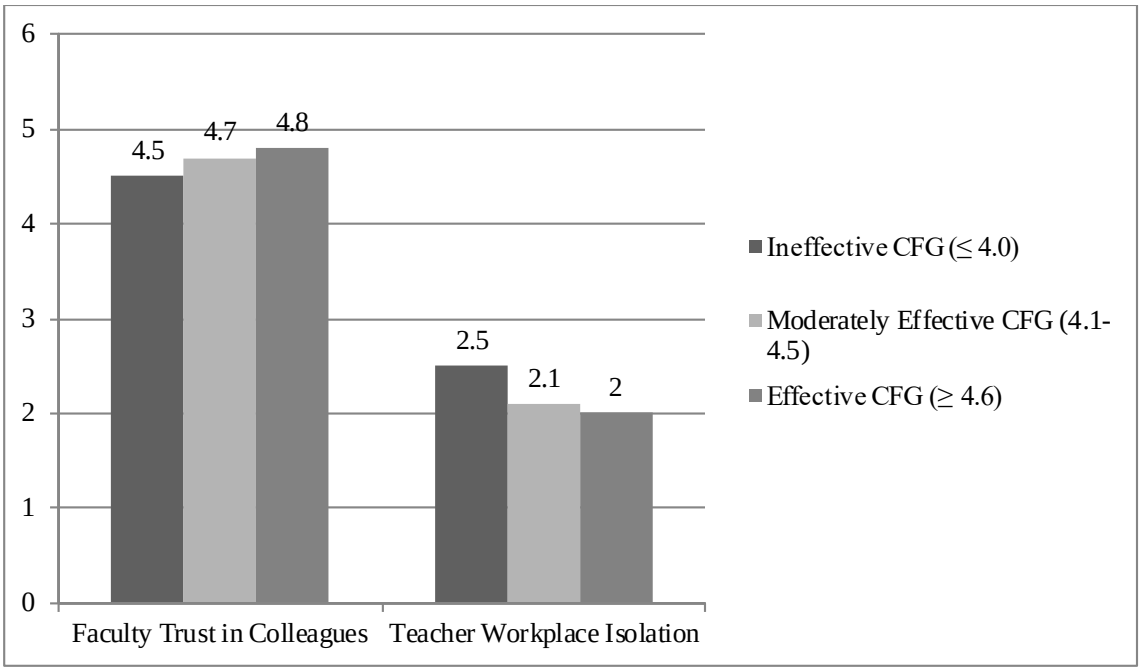


*Figure 11*

*Professional Climate Variables by CFG Effectiveness Band*

All three instructional environment variables reported in figure 12—collective teacher efficacy, teacher academic emphasis, and faculty trust in students—had higher average scores in effective CFGs. Schools with ineffective CFGs had a mean collective teacher efficacy score of 4.1, schools with moderate CFGs, had a mean collective teacher efficacy score of 4.6, and those with effective CFGs a mean collective teacher efficacy score of 4.8. One-Way ANOVA (Appendix F) results report statistically significant difference in collective teacher efficacy between all levels of CFG effectiveness: effective and moderately effective, effective and ineffective, and moderately effective and ineffective.

Average teacher academic emphasis scores were also higher in effective CFGs—effective CFGs had an average score of 5.1, moderately effective was 4.9, and ineffective was 4.7. One-Way ANOVA (Appendix G) results report statistically

significant difference in academic emphasis between all levels of CFG effectiveness: effective and moderately effective, effective and ineffective, and moderately effective and ineffective.

Examination of the relationship between CFG effectiveness and faculty trust in students, revealed higher levels of faculty trust in students in more effective CFGs. The average faculty trust in students score in schools with ineffective CFGs was approximately 3.7. The average score for faculty trust in students increased to 4.0 for schools with moderately effective CFG scores, and to 4.1 in schools with effective CFG scores. One-Way ANOVA (Appendix H) results report no statistically significant differences in faculty trust in students between the different levels of CFG effectiveness.

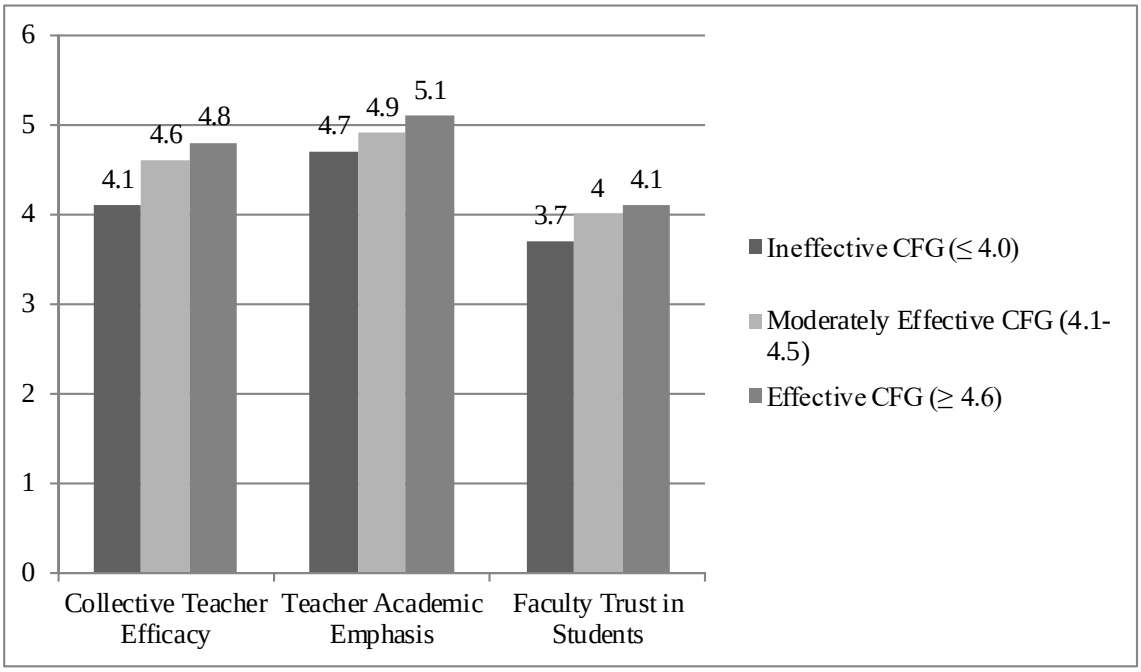


*Figure 12*

*Instructional Environment Variables by CFG Effectiveness Band*

The three leadership variables examined in the study and reported in figure 13—transformative leadership behaviors, enabling school structure, and faculty trust in principal—were all higher in schools with higher CFG effectiveness. The scores for teachers perceived transformative leadership behaviors averaged 4.3 for schools with low CFG effectiveness scores, 4.7 for schools with moderate CFG effectiveness scores, and 5.1 for schools with effective CFG scores. One-Way ANOVA (Appendix I) results report statistically significant differences in transformational leadership behaviors between all levels of CFG effectiveness: effective and moderately effective, effective and ineffective, and moderately effective and ineffective.

The average score for teachers' perception of an enabling school structure was 3.8 in schools with ineffective CFG scores. The average enabling school structure score increased to 4.4 in schools with moderate CFG effectiveness and to 4.6 in schools with effective CFGs. One-Way ANOVA (Appendix J) results report statistically significant difference in enabling school structure between effective and moderately effective and effective and ineffective schools, but not between moderately effective and ineffective.

Finally, the average score for faculty trust in principal was 4.1 in schools with ineffective CFG scores, 4.6 in schools with moderately effective CFG scores, and 4.8 in schools with effective CFG scores. One-Way ANOVA (Appendix K) results report statistically significant difference in faculty trust in principal between effective and moderately effective and effective and ineffective schools, but not between moderately effective and ineffective.

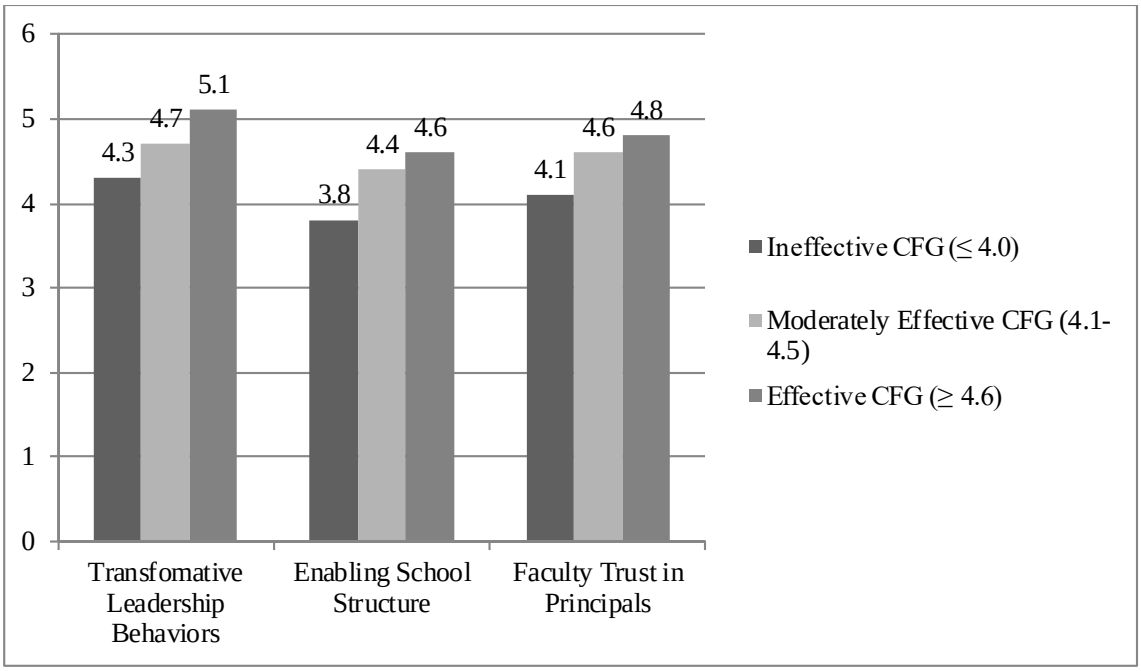


*Figure 13*

*Leadership Variables by CFG Effectiveness Band*

In summary, with the exception of teacher workplace isolation, all variables related to teacher professional climate, instructional environment, and school leadership averaged higher in schools where teachers perceive their CFGs to be effective. Teachers who have a higher perception of their CFGs also have a higher perception of the professional climate and instructional environment in which they work, as well as a higher perception of the behaviors of their school leader.

**EQ5. In schools with high teacher perception of CFG effectiveness, what has contributed to the successful implementation of CFGs?**

Principal interview data were used to explore factors that contribute to successful implementation of CFGs. Responses from three principals (one elementary, one middle, and one high school) whose average teacher CFG effectiveness response

was in the effective range were examined. Principals responded to the following interview questions:

1. What is your overall impression of Critical Friends Groups?
2. How did you approach the implementation and development of CFGs in your building?
3. How have you helped teachers understand the functions/purpose of CFGs?
4. What do you see has the most important element of effective CFG implementation?
5. What do you see as the greatest challenge to CFG implementation?
6. What additional thoughts or insights can you share around the implementation and development of CFGs?

While each of the principals interviewed had varied answers to the questions asked, three common themes emerged from their responses. In effective CFGs, school leaders stressed the necessity to create and protect time for teachers to come together to work with their CFG groups. While it emerged as a challenge for each of them, it is clear that each principal saw it as critical for successfully implementing and sustaining CFG work, and providing a space for meaningful conversations to occur among colleagues. The elementary principal interviewed specifically recognized the importance of establishing time during the teachers' contract day for CFGs to meet, which sends a positive message about the value of CFGs to teachers. The middle school principal referred to CFG time as "sacred" and she as well as the high school principal said it was their role as the building leader to establish and protect the time for CFGs to come together. In schools with successful CFGs, principals make them a

priority by establishing structures for CFGs to occur, and demonstrating their commitment to and value of the work of CFGs.

In addition to the ongoing time commitment principals made to ensuring CFGs were able to meet regularly, the principals interviewed spoke about the initial investment of time needed at the launch of CFGs, to ensuring her teachers were trained in CFG processes and protocols. The elementary principal said it was not enough to have just a few of her teachers trained and expect them to bring the work back, so she paid stipends for her entire team to be trained prior to the start of school. By investing in the training of all teachers in CFG processes and protocols, principals can ensure all teachers have an understanding of the purpose and function of their CFG, and build capacity for shared leadership among their teams.

A final theme that emerged from the interview responses was the idea of teachers having autonomy to drive the work of their CFG groups. The elementary principal interviewed stressed the importance of allowing teachers to self-select, drive the work, and maintain confidentiality, and said that a successful CFG leader must be willing to let go of control over teachers' time together. She acknowledged that this can be unsettling to some leaders and requires a culture in which teachers hold themselves and each other accountable for productive use of their time. The high school principal interviewed had the unique experience of being a new leader in a building in which teachers had previous experience implementing CFGs. She shared that as she learned more about the work of CFGs, she was impressed with teachers' ability to come together and have conversations and problem solve around real issues. She expressed her desire as their leader to support and build on the existing work of teachers learning

from one another. Each of these leaders responded to interview questions in ways that demonstrate an understanding of the need to allow teachers to take ownership of CFG processes and learn from one another, through honest and relevant conversations that take place within a culture of transparency and trust.

Each of these principals was the leader of a school in which teachers perceived the work of their CFG to be effective, yet each of them had clear differences in the ways in which they approached implementing and leading the work. Despite the nuances in approach, it is clear that building leadership plays a key role in supporting successful CFGs through investments of time, training and teacher autonomy. For these principals, these investments supported a culture in which teacher embraced and took ownership of their CFGs. Further studies are needed to explore additional factors that lead to teacher buy-in of CFGs, but the support of the principal cannot be overlooked. The critical role of building leadership is further explored in the discussion section.

## VI. Discussion

This section seeks to further clarify the data presented in the previous section, as it relates to the practical application in schools, particularly for school leaders. A discussion of the potential use of CFGs as a strategy to build trust and efficacy in school is presented first, followed by a discussion of the larger school climate variables associated with student achievement that may be influenced as CFGs develop. Challenges associated with the implementation and development of effective CFGs is discussed next. This section concludes with a discussion of the implications of CFG implementation and development for school leader practice.

### CFGs as a Strategy to Build Trust and Efficacy

The relationships between successful CFG implementation and levels of faculty trust in colleagues and teacher collective efficacy provided the foundation for the research conducted in this study. Research presented in the literature review section of this study supports the importance of trust and efficacy for quality teaching and learning. Trust is seen as a critical component of well-functioning organizations (Tschannen-Moran & Hoy, 1997) and can serve as a signal of conditions that promote effective teaching (Adams, 2013). Studies by Bandura (1993), Goddard (2000), Goddard and Goddard (2001) and Goddard, et. al. (2004) suggest that teachers' perceived collective efficacy is strongly related to student achievement in schools.

This study was developed with the knowledge that faculty trust and collective efficacy are important to school success, and sought to understand ways in which both conditions can be developed in schools. Findings from this study, as well as additional research, support the use of CFGs as a strategy for building faculty trust and collective

efficacy within schools. As was presented previously, both faculty trust in colleagues and teacher collective efficacy were found to be positively correlated to teachers' perceptions of their CFG effectiveness. That is to say, when perceptions of CFGs were positive, so too were levels of trust and efficacy. This was true even after controlling for additional school variables of free/reduced lunch, percent Caucasian, and principal transformative leadership behaviors.

The presence of faculty trust and collective efficacy in schools with effective CFGs is not surprising, given the structure and intended purpose of CFGs. When teachers come together regularly to engage with one another in a highly collaborative and supportive structure, positive relationships can develop (Morrisey, 2000). As teachers work together to problem solve and support one another in tackling common challenges and professional dilemmas, relationships can grow beyond superficial collegiality to deeper levels of trust among the group (Quate, 2004). As teachers observe their colleagues growing in their practice, and building their individual skills over time, it is logical to believe that they can have increasing confidence in one another's performance, thus leading to higher levels of collective teacher efficacy.

Faculty trust is defined as a faculty's belief that teachers can depend on one other in difficult situations, and that teachers can rely on the integrity of their colleagues (Tschannen-Moran & Hoy, 1997). Forsyth, Adams, and Hoy (2011) expand on this definition, calling faculty trust "a collective form of trust in which the faculty has an expectancy that the word, promise, and actions of another group of individuals can be relied upon and that the trusted party will act in the best interest of the faculty" (p. 4). They have identified vulnerability, risk, and interdependence as key elements of trust

and present five facets of trustworthiness that are commonly described in literature—benevolence, reliability, competence, honesty, and openness (Forsyth, et. al., 2011). The focused and collaborative nature of CFGs requires teachers to rely on one another to solve common professional dilemmas. This interdependence, combined with the vulnerability and level of personal risk required to share one's professional shortcoming with a groups requires a certain level of foundational trust to begin with. As the social context in which teachers feel increasingly safe to share and learn from one another develops, it is logical to assume that teachers will feel better positioned to be open and honest with one another and would begin to develop increased confidence in the protected interests of the group and the reliability and competence of the members within in it. CFGs support conditions in which teachers feel invested in one another's interests and well-being, develop confidence in each other's skills, and communicate honestly and openly with one another.

Tschannen-Moran and Hoy (1997) found trust to be associated with an environment of honesty, collegiality, professionalism, and authenticity, which perfectly describe the intended context of a CFG. CFGs allow members to willingly bring academic and professional dilemmas forward to problem solve with the group. These actions provide opportunities to identify colleagues as benevolent, reliable, competent, honest, and open. Trust grows as members interact, support and learn from one another, and develop deeper relationships (Moore & Carter-Hicks, 2014). Members become more likely to feel safe to make mistakes, discuss them, learn from them, and then find ways to solve problems. All keys, according to Lee, et. al (2001), to building the trust essential to the fulfillment of the team or school's objectives.

Turning to CFGs and collective teacher efficacy, the established relationship makes sense within the context of efficacy formation. Collective teacher efficacy refers to the shared perceptions of teachers in a school that the efforts of the faculty as a whole will have a positive effect on students (Goddard, et al., 2000). Social cognitive theory emphasizes the importance of social systems on human thought and learning that occur through observing a listening to one another (Bandura, 1997). It is the efficacy shaping behaviors that occur within the social context of high functioning CFGs that lend to the idea that the work of CFGs has the potential to lead to greater levels of teacher collective efficacy.

Bandura (1997) identified four sources of efficacy shaping information, critical for the development of both individual and collective efficacy beliefs: mastery experience, vicarious experience, social persuasion, and affective state. The processes and protocols of CFGs provide opportunities for each of these efficacy shaping experiences to occur. In high functioning CFGs teachers experience and share in one another's successes, learn from opportunities to listen and observe one another, provide one another with feedback and encouragement, and support each other's professional and emotional well-being.

According to Goddard (2004) the most powerful of these sources of efficacy shaping information is mastery experience. Mastery experience occurs in the context of CFGs as teachers experience success and develop confidence in the future success of themselves and their colleagues. Vicarious experience also occurs as members of a CFG observe and learn from the successes of one another. CFGs have the potential to greatly impact the efficacy source of social persuasion, whether through formal

feedback members provide one another, or simply the encouragement and discussion that occurs about teachers' ability to positively affect students. Finally, the affective states, or levels of emotional well-being, of CFG members are influenced by the positive interactions, relationships, and trust that develop in effective CFGs. As these sources are influenced, the senses of efficacy teachers need to overcome challenges and persist in demanding situations develop, fostering innovative teaching and student learning (Goddard, et. al., 2004).

CFGs themselves do not automatically make teachers trust one another, nor do they lead to immediate perceptions of colleagues' effectiveness. They do, however, provide the space and opportunity for teachers to get to know and better understand one another over time. Unlike less structured PLCs, CFGs use of structures and protocols support teachers in being more intentional in their dialogue and collaboration. In theory, this intentionality can support more efficient group development of trust and efficacy. In short, CFGs are designed to create contexts in which trust and efficacy are developed. School leaders, seeking to increase faculty trust and collective efficacy among teachers should consider the implementation of CFGs as one strategy that has the potential to positively influence both.

**CFGs as a Part of the Larger School Climate**

The effects of successful CFGs may extend beyond trust and efficacy to other features of a healthy school climate. Evaluation question four explored the relationship between teachers' perceived CFGs effectiveness and other school level factors. The variables examined fell into one of three categories—professional climate, instructional environment, and school leadership behaviors.

As has been previously presented, the professional climate variable of faculty trust in colleagues was found to be positively correlated with CFG effectiveness. As CFG effectiveness scores increased, so did the levels of faculty trust within the school. It makes sense then, that as perceptions of CFG effectiveness increase, teachers' senses of workplace isolation decrease. In his research on isolation, Flinders (1988) addresses two different constructs with which teacher isolation can be defined. The first deals with the teacher's work environment and the opportunities, or lack of opportunities, the teacher has to interact with colleagues. The second perspective defines teacher isolation as a psychological state, rather than as a condition of the work environment, that depends more on how teachers perceive and experience collegial interactions than on the sheer number of interactions in which they are involved (Flinders, 1998).

While it should be assumed that the implementation of successful CFGs addresses the first construct of workplace isolation, by ensuring teachers are meeting with colleagues on a regular basis, it also serves to address the second viewpoint of teacher isolation, by providing teachers access to and opportunities for high quality interactions. Regardless of the definition of teacher isolation being addressed, finding lower isolation in schools with higher CFG effectiveness is significant for issues of student achievement, because, Flinders (1998) argues, teacher isolation has a direct bearing on professional development, and has "been used to explain the minimal-to-nonexistent influence of research-based information on teacher decision making" (p. 19).

All three instructional environment variables explored in this research—collective teacher efficacy, teacher academic emphasis, and faculty trust in students—

were found to be higher in schools with effective CFGs. As was explored earlier in this section, and given the research on collective teacher efficacy, it makes sense that the opportunities effective CFGs provide for teachers to learn from one another and grow together in practice would lead to teachers' increased beliefs in the effectiveness of themselves and their colleagues. CFGs provide a space and the structure for teachers to successfully tackle common professional challenges, and to share, celebrate and learn from individual and collective success.

The relationship between effective CFGs and teacher academic emphasis and faculty trust in students may be somewhat less direct than previously discussed constructs. Academic emphasis is defined by Forsyth, Adams, and Hoy (2011) as faculty focus on student success in academics. They go on to describe academic emphasis as one of three elements—along with collective trust and collective efficacy—that make up academic optimism, or the collective set of beliefs about the strengths and capabilities within a school.

Forsyth, Adams, and Hoy (2011) claim the three elements of academic optimism—collective trust, collective efficacy, and academic emphasis—have a reciprocal relationship with one another, meaning that increases in one of the three will have a positive effect on the other two. Given their theory, and the findings of this research on the positive correlations between effective CFGs and faculty trust (a construct of collective trust) and teacher efficacy (a construct of collective efficacy), the relationship between CFG effectiveness and overall academic optimism (including the element of academic emphasis) is logical. Through protocols that allow teachers to

support one another in examining student data and work, CFGs can support teachers in increasing their shared focus on student outcomes and academic success.

The implications of CFG influenced increases in the elements of academic optimism, including academic emphasis, on student achievement are supported by studies presented by Forsyth, Adams, and Hoy (2011). They found that academic optimism, together with relational trust "foster a learning environment in which students embrace challenging goals, are motivated to exert strong effort, persist in difficult tasks, and are resilient in the face of setbacks' (p. 96). As students begin to demonstrate the characteristics described by Forsyth, Adams, and Hoy (2011), teachers' perceptions of students' readiness to learn is likely to increase.

As they relate to trust, increased evidence of student motivation, persistence, and resilience have the potential to influence the facets of trust development—particularly those of reliability and competence. As teachers begin to view students as being more dependable, and as students have opportunities to demonstrate their skills and understanding, teachers' trust in their students is likely to increase (Lee et. al., 2001). This increase in faculty trust in students is significant, as it is a critical component of collective trust, which Forsyth, Adams, and Hoy (2011) argue has consequences for school climate and culture, structure, behavior and outcomes, and ultimately school effectiveness. Effective CFGs provide a vehicle for teachers to collaboratively tackle a myriad of issues that affect the instructional environment of a school, and while it could be argued that there are multiple factors that influence instructional environment, CFGs should be considered as one potential structure for supporting the development of

collective efficacy, academic emphasis, and trust in students needed for healthy and successful schools.

The final constructs explored in evaluation question four—transformative leadership behaviors, enabling school structure, and faculty trust in principals—emphasize the critical role that school leaders play in the implementation and development of effective CFGs. Of the three variables presented, all scored higher in schools with effective teacher CFG perception. Conversely, schools with lower CFG effectiveness scores scored lower in all areas of leadership behavior.

These findings are not surprising when considering the interview data studied for evaluation question five. Principals in schools with effective CFGs revealed practices that serve as evidence of all three leadership behavior variables. In examining the trends that emerged from the interviews of principals whose teachers perceive their CFGs to be effective, all principals talked about creating and protecting the time for teachers to come together in their CFG groups. This provides one example of an enabling school structure that supports implementation. An additional theme to emerge from interviews dealt with the principals' willingness to let teachers drive and own the work of CFGs. This level of autonomy demonstrates and models trust, which has the potential to be reciprocated and perceived as transformational by teachers.

Research reinforces the critical role that the school leader plays in creating the context for and supporting the implementation of effective CFGs. Recalling the work of DuFour and Mattos (2013), the implementation and support of CFGs provides a vehicle for principals and school leaders to do what they argue is the most powerful strategy for improving both teaching and learning—that is, not "micromanaging

instruction, but creating the collaborative culture and collective responsibility of a professional learning community" (p. 37). Further implications for school leaders are presented later in the discussion section.

In summary, evidence suggests that CFGs can play a part in developing and sustaining multiple features, beyond trust and efficacy, of a healthy school climate. CFG effectiveness was associated with a healthy professional climate, in which teachers felt more trusting of and less isolated from one another. Additionally, a healthy instructional environment, in which teachers are focused on students' academic success, and are confident in one another's and in students' ability and readiness to learn, was evident in schools with effective CFGs. Finally, teachers perceptions of leadership behavior and schools structure, as well as their levels of trust in their principal were higher in in schools in which teacher perceive their CFGs to be effective.

**Challenges to Developing Functional CFGs**

Teacher perceptions of the effectiveness CFGs varied from site to site within the district, with average scores ranging from 3.3 to 5.5 on a 6 point scale. Approximately 22 (30 %) of the 74 schools surveyed across the district had an average teacher perception score greater than 4.6 which was the threshold set to determine effectiveness. Approximately 34 (46 %) schools had an average CFG effectiveness score between 4.1 and 4.5, considered to be moderately effective. Approximately 17 (23 %) of the 74 schools surveyed had an average score of 4.0 or less, which is considered ineffective. It should be noted that while an average teacher perception score of 4.6 or higher was the threshold set for CFGs to be effective, the majority of schools in this range scored between 4.6 and 5.0. Had the bar been set higher, at 5.0 for example, the number of

schools considered effective would drop considerably. Only three schools had an average teacher perception of 5.0 or higher. These data speak to the complexity and challenges associated with implementing effective CFGs.

The principal interview data examined for evaluation question five provides additional insight into the complexity and challenges of implementing CFGs. Although the principals interviewed all led schools in which teachers perceived their CFGs to be effective, these leaders still identified several challenges to successful implementation. While time emerged as a key component of successful CFGs previously discussed, it also emerged as a challenge. Successful CFG implementation requires a commitment from the building leader train teachers in CFG processes and protocols, and to establish and protect time for teachers to meet in their CFG groups. Building leaders may find it difficult to sustain the time needed to invest in the professional learning needs of teachers with competing priorities and other demands on teachers' time, given constrictions such as teacher contract days and limited planning/prep time. In addition to simply finding enough time within the work day to conduct CFGs, principals identified the challenge of ensuring CFG time is focused and productive, with a clear and specific objective for the work. This issue of accountability becomes more complex when you consider the importance of autonomy in successful CFGs. Ultimately, the accountability must come from within the CFG group and not from the micromanaging of the school leader.

Another challenge surface in the principal interview data is that of creating a culture of vulnerability and transparency, in which individuals are willing to take risks and be open to feedback. It is these environments in which CFGs have the greatest

potential to build trust among colleagues, and significantly improve practice. The challenge becomes, again, the time needed to invest in processes that will build these relationships over time. Neither trust nor effective CFGs develop overnight. Both take time, training and commitment to grow among even the most willing staffs.

**Implications for Leadership**

Research supports the use of CFGs as a structure for providing teachers with high-quality, job-embedded, ongoing, personalized learning experiences (Cox, 2010). Given existing research, and the findings from this study on the potential of CFGs to provide for the development of various school level factors correlated to student achievement, school leaders should give consideration to ways in which they can support CFG processes and protocols, and the teacher driven work that gives them such a powerful potential for professional growth.

This evaluation revealed that CFGs are, in fact, correlated to higher levels of faculty trust in colleagues and collective teacher efficacy. Additionally, schools with effective CFGs had a healthy school climate. While the work of CFGs is ultimately teacher driven, school leaders play a critical role in creating the conditions for CFG success. As the interviews with school leaders revealed, implementing successful CFGs requires commitment of time and resources. Just as importantly, it also requires patience on the part of the school leader, as effective CFG structures and processes, and the resulting trust and efficacy they support take time to develop, even among the most willing staff (Quate, 2004).

School leaders seeking to build trust and instructional capacity of teachers can consider CFGs as a potential strategy for increasing both. But, in doing so, must be

willing to make the initial commitment of time needed to ensure teachers are trained and have an understanding of the purposes and process of CFGs. It is clear that CFGs do not become effective by themselves, as several teachers and schools in this study did not have favorable experiences, or reach a desirable effective level. By investing time up front, principals can be confident that teachers understand the purpose and function of CFGs, and have the foundational skills needed to launch the work. This will also serve to ensure the precious time invested in ongoing CFGs is effectively facilitated, and that the autonomy teachers experience in CFGs leads to targeted and focused interactions.

Additionally, school leaders must sustain that initial commitment to CFGs. Protecting time for CFGs to come together regularly on an ongoing basis is important. It may be perceived as a sacrifice at the expense of other priorities, but protecting the time needed for CFG work is critical to supporting effective implementation, in that it ensures teachers have ample time to develop their facilitation and participation skills, and sends an important message about the value of CFG work. Once established, the time for CFGs to meet must be prioritized above other competing priorities and held sacred. This may require building leaders to think outside of the box on ways in which they disseminate information or conduct "housekeeping" type meetings, so as not to compete with the time designated for the work of CFGs.

Finally, school leaders must exercise patience, and "stay the course" when implementing CFGs. As is the case with school reform efforts, the complex work of high functioning CFGs and the healthy school climates they support take time to authentically develop. Leaders must resist the temptation to abandon CFG work in

favor of "the next big thing" at the first sign of trouble. Teachers will not become experts at facilitating or participating in the work of CFGs, nor will the intended outcomes of faculty trust and collective efficacy develop overnight. Given time, however, CFGs and the members in them, will develop to include intentional and professional discourse, and deeper levels of dialogue and learning about teaching practices, student work, teacher tasks, and professional dilemmas (Quate, 2004). It is these ongoing conversations that will foster the development of a school culture in which faculty trust in colleagues and teacher collective efficacy are present and thriving. By developing these two variables and others that support a healthy school climate, CFGs have the potential for great influence on school success when it comes to effective teaching practices and positive learning experiences for students.

## VII. Conclusion

This study was based on a process evaluation of the theory of action for Critical Friends Groups as they were being implemented in Tulsa Public Schools. A process evaluation is designed to provide evaluation evidence on the implementation and delivery of interventions, and provide leaders with the chance to revise and improve interventions to help them have the best chance of accomplishing their intended goals or outcomes (McDavid & Hawthorne, 2006). This study sought to provide evidence to inform the implementation of CFGs within Tulsa Public schools and to expand upon existing research on the implementation and effect of CFGs.

### Contributions to Tulsa Public Schools Implementation of CFGs

This evaluation provided data on the implementation of CFG processes in schools across the district, to determine if faculty trust in colleagues and teacher collective efficacy were higher in schools with effective CFGs, and to begin to understand why and how elements of the CFG protocols support trust and efficacy formation. Additionally, this evaluation sought to identify other features of a healthy school climate associated with effective CFG implementation and to identify school leader behaviors that support and sustain successful CFGs.

From a practice perspective, the implementation of CFGs addressed the ongoing challenge Tulsa Public Schools faces in developing and retaining quality teachers. Given this challenge, interventions are needed to develop cultures in which the conditions needed for learning, faculty trust and collective teacher efficacy, exist. This evaluation sought to determine if CFGs can provide a social organization that is conducive to teacher growth.

This study provided evidence linking effective CFGs to higher levels of faculty trust and collective efficacy, as well as additional school level variables associated with student achievement. Additionally, it identified trends in leadership behaviors in schools with successful CFGs. Ultimately, this research serves to inform the practices of leaders in Tulsa Public Schools who are considering the implementation of CFGs as a strategy to support improved teacher learning and the development of a healthy school climate shown to have a positive effect on student achievement.

**Contributions to CFG Research**

This study expands upon and takes a different approach from the existing research on PLCs and CFGs. Most existing research focuses on the characteristics of effective CFGs, as well as school improvement as a result of implementation, but not much is known about the connection between them and other teacher or school level factors, such as faculty trust in colleagues or collective teacher efficacy (Lee, Zhang, and Yin, 2001).

This evaluation researched teacher collaboration through CFGs, and specifically sought to determine the relationship between CFG effectiveness and faculty trust in colleagues and collective teacher efficacy. Given the evidence linking both conditions to student achievement (Hoy, Tarter, & Witkoskie, 1992; Goddard, Hoy, & Hoy, 2000), this study explored the theory that CFG implementation could lead to higher levels of faculty trust in colleagues and perceived collective teacher efficacy. It also examined differences in additional school climate variables related to CFG effectiveness and leadership factors supportive of CFG development.

This evaluation adds to the research that supports the use of CFGs processes and protocols for providing teachers with high quality professional development and improved practice (Cox, 2010) by providing evidence that suggests CFGs have a place in supporting the larger school instructional environment, professional climate, and leadership behaviors associated with improved student achievement.

**Opportunities for Further Research**

This process evaluation sought to inform the practice of school leaders considering the implementation of CFGs as a way to improve teacher collaborative learning and support a healthy school climate, as well as to contribute to existing research on CFGs by providing evidence to suggest that effective CFGs are associated with higher levels of faculty trust in colleagues and collective teacher efficacy. While the study successfully addressed both the problem of practice and the research problem posed, it still leaves many questions about the implementation of CFGs unanswered and opportunities to further study the implementation of CFGs.

This study focused on analyzing schools in which high functioning CFGs were already developed to determine if there was a relationship between effective CFGs and levels of faculty trust in colleagues and collective efficacy among the staff. Further research is needed to determine the ways in which these developed into the collaborative groups the teacher in them perceive to be effective.

Additionally, this study focused on the perceptions of teachers as a collective group, and not on the individual members within CFGs. Opportunities for further research include an analysis of teachers at an individual level to determine what changes are happening to teachers' overall senses of professional well-being as a result

of participation in CFGs that are potentially leading to greater levels of trust, efficacy, and perceptions of other school level variables associated with success.

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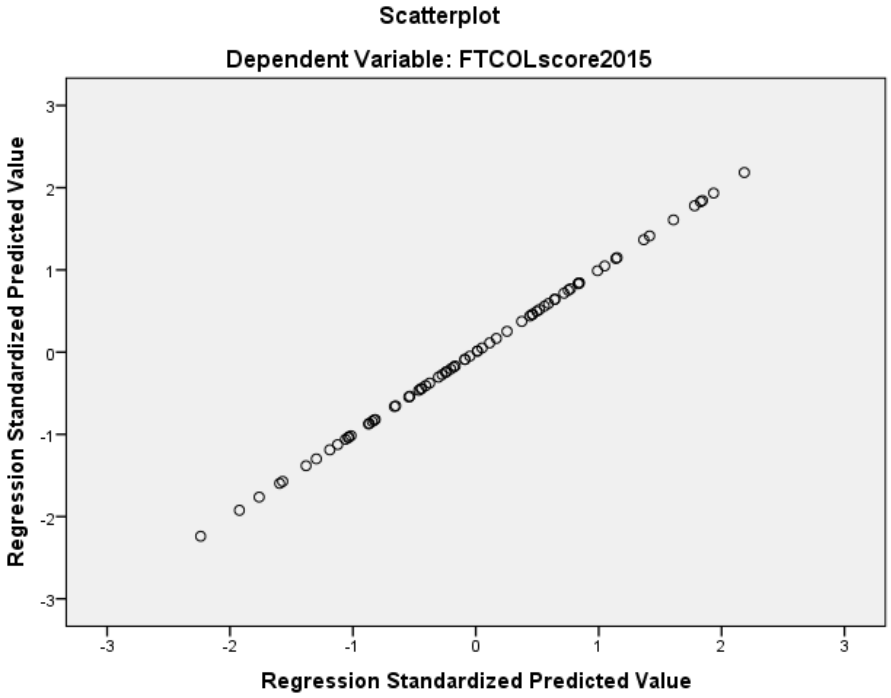
## Appendix A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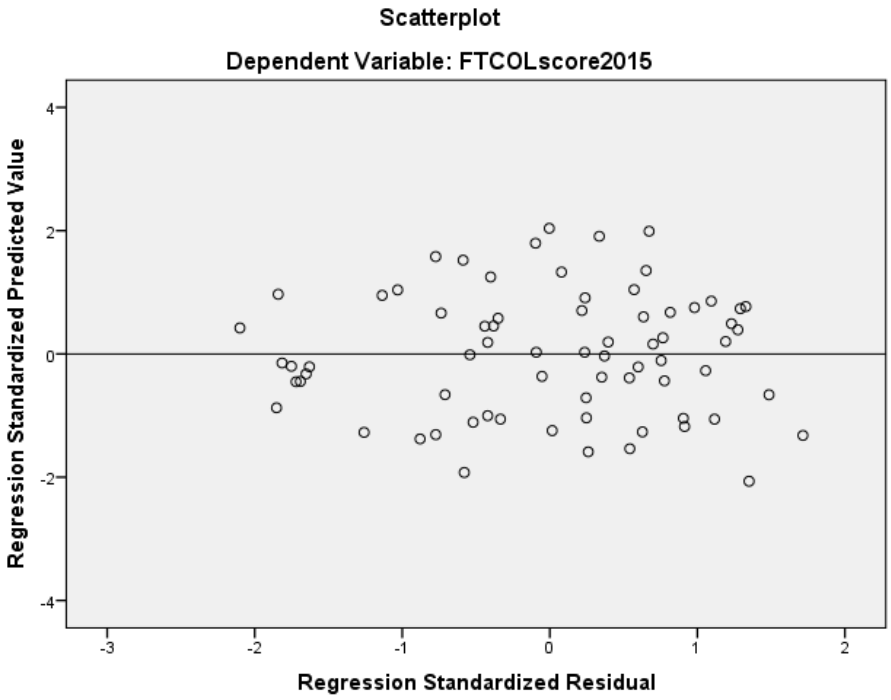
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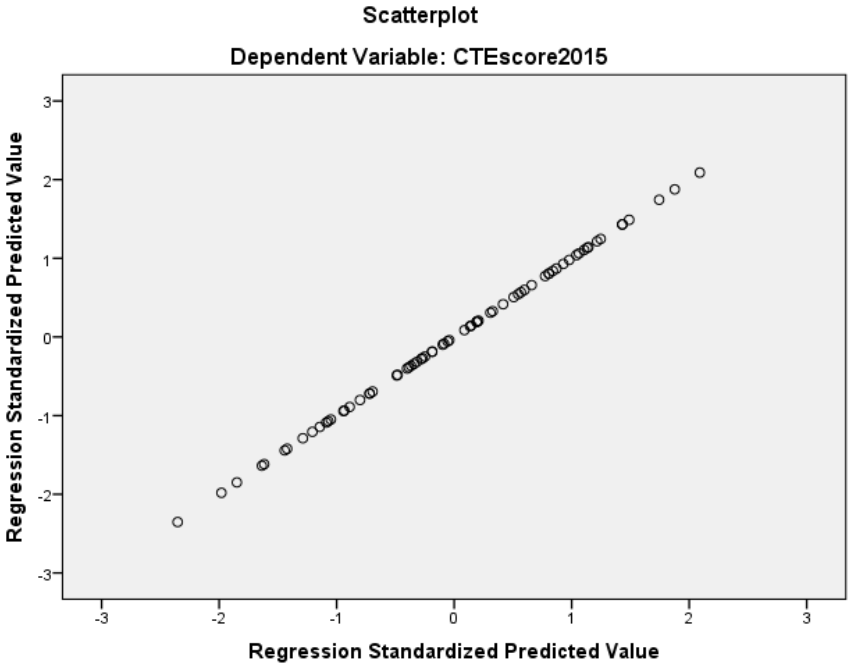
## Appendix B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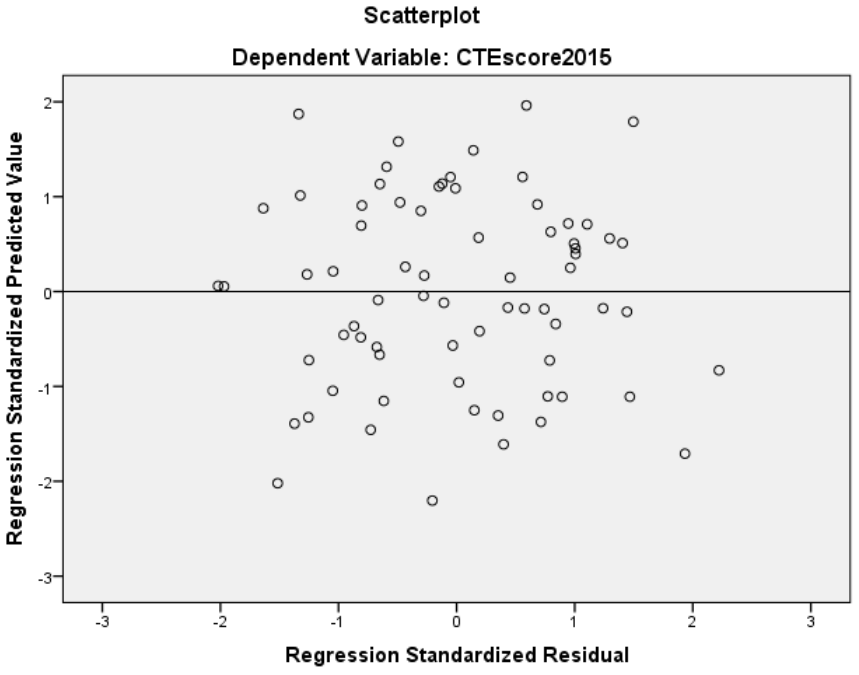
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Regression Standardized Predicted Value
Regression Standardized Residual
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-1
-2
-3

## Appendix C

**Tests of Between-Subjects Effects for CFG Effectives**

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial Eta Squared | Noncent. Parameter | Observed Power[b] |
|---|---|---|---|---|---|---|---|---|
| Corrected Model | 12.682[a] | 2 | 6.341 | 202.093 | .000 | .851 | 404.186 | 1.000 |
| Intercept | 1343.576 | 1 | 1343.576 | 42821.547 | .000 | .998 | 42821.547 | 1.000 |
| CFG Effect. | 12.682 | 2 | 6.341 | 202.093 | .000 | .851 | 404.186 | 1.000 |
| Error | 2.228 | 71 | .031 | | | | | |
| Total | 1400.539 | 74 | | | | | | |
| Corrected Total | 14.910 | 73 | | | | | | |

a. R Squared = .851 (Adjusted R Squared = .846)

b. Computed using alpha = .05

**Multiple Comparisons**

| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval Lower Bound | 95% Confidence Interval Upper Bound |
|---|---|---|---|---|---|---|---|
| Tukey HSD | 1.00 | 2.00 | -.575* | .0504 | .000 | -.696 | -.454 |
| | | 3.00 | -1.075* | .0535 | .000 | -1.203 | -.947 |
| | 2.00 | 1.00 | .575* | .0504 | .000 | .454 | .696 |
| | | 3.00 | -.500* | .0491 | .000 | -.617 | -.382 |
| | 3.00 | 1.00 | 1.075* | .0535 | .000 | .947 | 1.203 |
| | | 2.00 | .500* | .0491 | .000 | .382 | .617 |
| Bonferroni | 1.00 | 2.00 | -.575* | .0504 | .000 | -.699 | -.452 |
| | | 3.00 | -1.075* | .0535 | .000 | -1.206 | -.944 |
| | 2.00 | 1.00 | .575* | .0504 | .000 | .452 | .699 |
| | | 3.00 | -.500* | .0491 | .000 | -.620 | -.379 |
| | 3.00 | 1.00 | 1.075* | .0535 | .000 | .944 | 1.206 |
| | | 2.00 | .500* | .0491 | .000 | .379 | .620 |

Based on observed means.

The error term is Mean Square(Error) = .031.

*. The mean difference is significant at the .05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

## Appendix D

**Tests of Between-Subjects Effects for Faculty Trust in Colleagues**

Dependent Variable: FTCOLscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1.343[a] | 2 | .671 | 4.535 | .014 |
| Intercept | 1581.377 | 1 | 1581.377 | 10680.369 | .000 |
| CFG Effect | 1.343 | 2 | .671 | 4.535 | .014 |
| Error | 10.513 | 71 | .148 | | |
| Total | 1634.038 | 74 | | | |
| Corrected Total | 11.855 | 73 | | | |

a. R Squared = .113 (Adjusted R Squared = .088)

**Multiple Comparisons**

Dependent Variable: FTCOLscore2015

| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | 1.00 | 2.00 | -.195 | .1095 | .183 | -.457 | .067 |
| | | 3.00 | -.349* | .1161 | .010 | -.627 | -.071 |
| | 2.00 | 1.00 | .195 | .1095 | .183 | -.067 | .457 |
| | | 3.00 | -.154 | .1066 | .322 | -.410 | .101 |
| | 3.00 | 1.00 | .349* | .1161 | .010 | .071 | .627 |
| | | 2.00 | .154 | .1066 | .322 | -.101 | .410 |
| Bonferroni | 1.00 | 2.00 | -.195 | .1095 | .238 | -.463 | .073 |
| | | 3.00 | -.349* | .1161 | .011 | -.634 | -.065 |
| | 2.00 | 1.00 | .195 | .1095 | .238 | -.073 | .463 |
| | | 3.00 | -.154 | .1066 | .456 | -.416 | .107 |
| | 3.00 | 1.00 | .349* | .1161 | .011 | .065 | .634 |
| | | 2.00 | .154 | .1066 | .456 | -.107 | .416 |

Based on observed means.

The error term is Mean Square(Error) = .148.

*. The mean difference is significant at the 0.05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

## Appendix E

**Tests of Between-Subjects Effects**

Dependent Variable: TWIscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 3.685[a] | 2 | 1.842 | 26.187 | .000 |
| Intercept | 357.045 | 1 | 357.045 | 5074.909 | .000 |
| CFG Effect | 3.685 | 2 | 1.842 | 26.187 | .000 |
| Error | 4.995 | 71 | .070 | | |
| Total | 369.352 | 74 | | | |
| Corrected Total | 8.680 | 73 | | | |

a. R Squared = .425 (Adjusted R Squared = .408)

**Multiple Comparisons**

Dependent Variable: TWIscore2015

| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval Lower Bound | 95% Confidence Interval Upper Bound |
|---|---|---|---|---|---|---|---|
| Tukey HSD | 1.00 | 2.00 | .374* | .0755 | .000 | .193 | .555 |
| | | 3.00 | .571* | .0801 | .000 | .380 | .763 |
| | 2.00 | 1.00 | -.374* | .0755 | .000 | -.555 | -.193 |
| | | 3.00 | .197* | .0735 | .024 | .021 | .373 |
| | 3.00 | 1.00 | -.571* | .0801 | .000 | -.763 | -.380 |
| | | 2.00 | -.197* | .0735 | .024 | -.373 | -.021 |
| Bonferroni | 1.00 | 2.00 | .374* | .0755 | .000 | .189 | .559 |
| | | 3.00 | .571* | .0801 | .000 | .375 | .768 |
| | 2.00 | 1.00 | -.374* | .0755 | .000 | -.559 | -.189 |
| | | 3.00 | .197* | .0735 | .027 | .017 | .377 |
| | 3.00 | 1.00 | -.571* | .0801 | .000 | -.768 | -.375 |
| | | 2.00 | -.197* | .0735 | .027 | -.377 | -.017 |

Based on observed means.

The error term is Mean Square(Error) = .070.

*. The mean difference is significant at the 0.05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

## Appendix F

**Tests of Between-Subjects Effects: Collective Teacher Efficacy**

Dependent Variable: CTEscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 5.116[a] | 2 | 2.558 | 21.424 | .000 |
| Intercept | 1472.369 | 1 | 1472.369 | 12332.447 | .000 |
| CFG Effect | 5.116 | 2 | 2.558 | 21.424 | .000 |
| Error | 8.477 | 71 | .119 | | |
| Total | 1530.829 | 74 | | | |
| Corrected Total | 13.592 | 73 | | | |

a. R Squared = .376 (Adjusted R Squared = .359)

## Post Hoc Tests

**Multiple Comparisons**

Dependent Variable: CTEscore2015

| | | | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | Lower Bound | Upper Bound |
| Tukey HSD | 1.00 | 2.00 | -.436* | .0983 | .000 | -.671 | -.201 |
| | | 3.00 | -.674* | .1043 | .000 | -.924 | -.425 |
| | 2.00 | 1.00 | .436* | .0983 | .000 | .201 | .671 |
| | | 3.00 | -.238* | .0958 | .040 | -.468 | -.009 |
| | 3.00 | 1.00 | .674* | .1043 | .000 | .425 | .924 |
| | | 2.00 | .238* | .0958 | .040 | .009 | .468 |
| Bonferroni | 1.00 | 2.00 | -.436* | .0983 | .000 | -.677 | -.195 |
| | | 3.00 | -.674* | .1043 | .000 | -.930 | -.419 |
| | 2.00 | 1.00 | .436* | .0983 | .000 | .195 | .677 |
| | | 3.00 | -.238* | .0958 | .046 | -.473 | -.004 |
| | 3.00 | 1.00 | .674* | .1043 | .000 | .419 | .930 |
| | | 2.00 | .238* | .0958 | .046 | .004 | .473 |

Based on observed means.

The error term is Mean Square(Error) = .119.

*. The mean difference is significant at the 0.05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

## Appendix G

**Tests of Between-Subjects Effects**

Dependent Variable: FAEscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1.844[a] | 2 | .922 | 8.716 | .000 |
| Intercept | 1738.410 | 1 | 1738.410 | 16432.463 | .000 |
| CFG Effect | 1.844 | 2 | .922 | 8.716 | .000 |
| Error | 7.511 | 71 | .106 | | |
| Total | 1794.539 | 74 | | | |
| Corrected Total | 9.355 | 73 | | | |

a. R Squared = .197 (Adjusted R Squared = .175)

**Multiple Comparisons**

Dependent Variable: FAEscore2015

| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | 1.00 | 2.00 | -.254* | .0925 | .021 | -.475 | -.032 |
| | | 3.00 | -.407* | .0982 | .000 | -.642 | -.172 |
| | 2.00 | 1.00 | .254* | .0925 | .021 | .032 | .475 |
| | | 3.00 | -.153 | .0901 | .214 | -.369 | .063 |
| | 3.00 | 1.00 | .407* | .0982 | .000 | .172 | .642 |
| | | 2.00 | .153 | .0901 | .214 | -.063 | .369 |
| Bonferroni | 1.00 | 2.00 | -.254* | .0925 | .023 | -.480 | -.027 |
| | | 3.00 | -.407* | .0982 | .000 | -.647 | -.166 |
| | 2.00 | 1.00 | .254* | .0925 | .023 | .027 | .480 |
| | | 3.00 | -.153 | .0901 | .282 | -.374 | .068 |
| | 3.00 | 1.00 | .407* | .0982 | .000 | .166 | .647 |
| | | 2.00 | .153 | .0901 | .282 | -.068 | .374 |

Based on observed means.

The error term is Mean Square(Error) = .106.

*. The mean difference is significant at the 0.05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

## Appendix H

**Tests of Between-Subjects Effects**

Dependent Variable: FTSTUscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 1.592[a] | 2 | .796 | 2.820 | .066 |
| Intercept | 1133.851 | 1 | 1133.851 | 4016.791 | .000 |
| CFG Effect | 1.592 | 2 | .796 | 2.820 | .066 |
| Error | 20.042 | 71 | .282 | | |
| Total | 1188.066 | 74 | | | |
| Corrected Total | 21.634 | 73 | | | |

a. R Squared = .074 (Adjusted R Squared = .047)

**Multiple Comparisons**

Dependent Variable: FTSTUscore2015

| | | | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | Lower Bound | Upper Bound |
| Tukey HSD | 1.00 | 2.00 | -.2665 | .15117 | .189 | -.6284 | .0953 |
| | | 3.00 | -.3691 | .16036 | .062 | -.7529 | .0148 |
| | 2.00 | 1.00 | .2665 | .15117 | .189 | -.0953 | .6284 |
| | | 3.00 | -.1025 | .14725 | .766 | -.4550 | .2500 |
| | 3.00 | 1.00 | .3691 | .16036 | .062 | -.0148 | .7529 |
| | | 2.00 | .1025 | .14725 | .766 | -.2500 | .4550 |
| Bonferroni | 1.00 | 2.00 | -.2665 | .15117 | .247 | -.6372 | .1041 |
| | | 3.00 | -.3691 | .16036 | .073 | -.7623 | .0241 |
| | 2.00 | 1.00 | .2665 | .15117 | .247 | -.1041 | .6372 |
| | | 3.00 | -.1025 | .14725 | 1.000 | -.4636 | .2585 |
| | 3.00 | 1.00 | .3691 | .16036 | .073 | -.0241 | .7623 |
| | | 2.00 | .1025 | .14725 | 1.000 | -.2585 | .4636 |

Based on observed means.

The error term is Mean Square(Error) = .282. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

# Appendix I

**Tests of Between-Subjects Effects**

Dependent Variable: TLBscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 7.864[a] | 2 | 3.932 | 16.369 | .000 |
| Intercept | 1591.530 | 1 | 1591.530 | 6625.515 | .000 |
| CFG Effect | 7.864 | 2 | 3.932 | 16.369 | .000 |
| Error | 17.055 | 71 | .240 | | |
| Total | 1662.875 | 74 | | | |
| Corrected Total | 24.919 | 73 | | | |

a. R Squared = .316 (Adjusted R Squared = .296)

**Multiple Comparisons**

Dependent Variable: TLBscore2015

| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval Lower Bound | 95% Confidence Interval Upper Bound |
|---|---|---|---|---|---|---|---|
| Tukey HSD | 1.00 | 2.00 | -.457* | .1394 | .005 | -.791 | -.124 |
| | | 3.00 | -.846* | .1479 | .000 | -1.200 | -.492 |
| | 2.00 | 1.00 | .457* | .1394 | .005 | .124 | .791 |
| | | 3.00 | -.389* | .1358 | .015 | -.714 | -.064 |
| | 3.00 | 1.00 | .846* | .1479 | .000 | .492 | 1.200 |
| | | 2.00 | .389* | .1358 | .015 | .064 | .714 |
| Bonferroni | 1.00 | 2.00 | -.457* | .1394 | .005 | -.799 | -.115 |
| | | 3.00 | -.846* | .1479 | .000 | -1.209 | -.483 |
| | 2.00 | 1.00 | .457* | .1394 | .005 | .115 | .799 |
| | | 3.00 | -.389* | .1358 | .017 | -.722 | -.056 |
| | 3.00 | 1.00 | .846* | .1479 | .000 | .483 | 1.209 |
| | | 2.00 | .389* | .1358 | .017 | .056 | .722 |

Based on observed means.

The error term is Mean Square(Error) = .240.

*. The mean difference is significant at the 0.05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

## Appendix J

**Tests of Between-Subjects Effects**

Dependent Variable: ESSscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 6.410[a] | 2 | 3.205 | 9.324 | .000 |
| Intercept | 1315.533 | 1 | 1315.533 | 3826.750 | .000 |
| CFG Effect | 6.410 | 2 | 3.205 | 9.324 | .000 |
| Error | 24.408 | 71 | .344 | | |
| Total | 1391.127 | 74 | | | |
| Corrected Total | 30.818 | 73 | | | |

a. R Squared = .208 (Adjusted R Squared = .186)

**Multiple Comparisons**

Dependent Variable: ESSscore2015

| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower Bound | Upper Bound |
| Tukey HSD | 1.00 | 2.00 | -.546* | .1668 | .005 | -.945 | -.146 |
| | | 3.00 | -.736* | .1770 | .000 | -1.160 | -.313 |
| | 2.00 | 1.00 | .546* | .1668 | .005 | .146 | .945 |
| | | 3.00 | -.191 | .1625 | .473 | -.580 | .198 |
| | 3.00 | 1.00 | .736* | .1770 | .000 | .313 | 1.160 |
| | | 2.00 | .191 | .1625 | .473 | -.198 | .580 |
| Bonferroni | 1.00 | 2.00 | -.546* | .1668 | .005 | -.955 | -.137 |
| | | 3.00 | -.736* | .1770 | .000 | -1.170 | -.302 |
| | 2.00 | 1.00 | .546* | .1668 | .005 | .137 | .955 |
| | | 3.00 | -.191 | .1625 | .734 | -.589 | .208 |
| | 3.00 | 1.00 | .736* | .1770 | .000 | .302 | 1.170 |
| | | 2.00 | .191 | .1625 | .734 | -.208 | .589 |

Based on observed means.

The error term is Mean Square(Error) = .344.

*. The mean difference is significant at the 0.05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

## Appendix K

**Tests of Between-Subjects Effects**

Dependent Variable: FTPRINscore2015

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Corrected Model | 5.758[a] | 2 | 2.879 | 6.579 | .002 |
| Intercept | 1461.981 | 1 | 1461.981 | 3340.820 | .000 |
| CFG Effect | 5.758 | 2 | 2.879 | 6.579 | .002 |
| Error | 31.070 | 71 | .438 | | |
| Total | 1548.901 | 74 | | | |
| Corrected Total | 36.828 | 73 | | | |

a. R Squared = .156 (Adjusted R Squared = .133)

**Multiple Comparisons**

Dependent Variable: FTPRINscore2015

| | | | | | | 95% Confidence Interval | |
|---|---|---|---|---|---|---|---|
| | (I) VAR00001 | (J) VAR00001 | Mean Difference (I-J) | Std. Error | Sig. | Lower Bound | Upper Bound |
| Tukey HSD | 1.00 | 2.00 | -.552* | .1882 | .012 | -1.002 | -.101 |
| | | 3.00 | -.679* | .1997 | .003 | -1.157 | -.202 |
| | 2.00 | 1.00 | .552* | .1882 | .012 | .101 | 1.002 |
| | | 3.00 | -.128 | .1833 | .766 | -.567 | .311 |
| | 3.00 | 1.00 | .679* | .1997 | .003 | .202 | 1.157 |
| | | 2.00 | .128 | .1833 | .766 | -.311 | .567 |
| Bonferroni | 1.00 | 2.00 | -.552* | .1882 | .014 | -1.013 | -.090 |
| | | 3.00 | -.679* | .1997 | .003 | -1.169 | -.190 |
| | 2.00 | 1.00 | .552* | .1882 | .014 | .090 | 1.013 |
| | | 3.00 | -.128 | .1833 | 1.000 | -.577 | .322 |
| | 3.00 | 1.00 | .679* | .1997 | .003 | .190 | 1.169 |
| | | 2.00 | .128 | .1833 | 1.000 | -.322 | .577 |

Based on observed means.

The error term is Mean Square(Error) = .438.

*. The mean difference is significant at the 0.05 level. 1 = Effective CFG; 2 = Moderately Effective; 3 = Ineffective

**Appendix L**

## Consultancy Protocol

A Consultancy is a structured process for helping an individual or team think more expansively about a particular, concrete dilemma.

Time: Approximately 50 minutes

Roles:

Presenter (whose work is being discussed by the group)

Facilitator (who sometimes participates, depending on the size of the group)

1. The presenter gives an overview of the dilemma with which s/he is struggling, and frames a question for the Consultancy group to consider. The framing of this question, as well as the quality of the presenter's reflection on the dilemma being discussed, are key features of this protocol. If the presenter has brought student work, educator work, or other "artifacts," there is a pause here to silently examine the work/ documents. The focus of the group's conversation is on the dilemma. (5-10 minutes)
2. The Consultancy group asks clarifying questions of the presenter — that is, questions that have brief, factual answers. (5 minutes)
3. The group asks probing questions of the presenter. These questions should be worded so that they help the presenter clarify and expand his/her thinking about the dilemma presented to the Consultancy group. The goal here is for the presenter to learn more about the question s/he framed or to do some analysis of the dilemma presented. The presenter may respond to the group's questions, but there is no discussion by the Consultancy group of the presenter's responses. At

the end of the ten minutes, the facilitator asks the presenter to re-state his/her question for the group. (10 minutes)

4. The group talks with each other about the dilemma presented. (15 minutes)

   Possible questions to frame the discussion:

   - What did we hear?
   - What didn't we hear that they think might be relevant? What assumptions seem to be operating?
   - What questions does the dilemma raise for us? What do we think about the dilemma?
   - What might we do or try if faced with a similar dilemma? What have we done in similar situations?

   Members of the group sometimes suggest actions the presenter might consider taking. Most often, however, they work to define the issues more thoroughly and objectively. The presenter doesn't speak during this discussion, but instead listens and takes notes.

5. The presenter reflects on what s/he heard and on what s/he is now thinking, sharing with the group anything that particularly resonated for him or her during any part of the Consultancy. (5 minutes)
6. The facilitator leads a brief conversation about the group's observation of the Consultancy process. (5 minutes)

**Appendix M**

## Four "A"s Text Protocol

Purpose: To explore a text deeply in light of one's own values and intentions.

Roles: Facilitator/timekeeper (who also participates); participants.

Time: Five minutes total for each participant, plus ten minutes for the final two steps.

1. The group reads the text silently, highlighting it and writing notes in the margin on post-it notes in answer to the following four questions (you can also add your own "A"s).
    - What Assumptions does the author of the text hold?
    - What do you Agree with in the text?
    - What do you want to Argue with in the text?
    - What parts of the text do you want to Aspire to (or Act upon)?
2. In a round, have each person identify one assumption in the text, citing the text (with page numbers, if appropriate) as evidence.
3. Either continue in rounds or facilitate a conversation in which the group talks about the text in light of each of the remaining "A"s, taking them one at a time – what do people want to argue with, agree with, and aspire to (or act upon) in the text? Try to move seamlessly from one "A" to the next, giving each "A" enough time for full exploration.
4. End the session with an open discussion framed around a question such as: What does this mean for our work with students?
5. Debrief the text experience.