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ABSTRACT

Education reforms across the country rely on school teams to bring innovative practices to life. In the last decade, these efforts have evolved against a data-rich backdrop, where data fuel decisions about achievement, instruction, and assessment. Many schools focus reform initiatives on data inquiry cycles that expect teacher and administrator teams to examine student work and design, implement, and assess interventions to improve achievement. Schools are inherently social organizations with their own systems through which new practices and beliefs can travel. As collaborative inquiry ascends in prominence as a school "reform engine," so does the ongoing concern over identifying factors that can support teams' development of networked communities of practice and spread of evidence-based practices and beliefs. This work is extremely challenging and typically requires expert assistance. One crucial and under-explored influence for collaborative inquiry is the strategic role that trained outside facilitators can play in helping teams to grow evidence-based work at their sites.

Inquiry that shapes leadership and practice generally requires experienced trainers who can strategically guide shifts in teachers' habits and beliefs, and establish collaborative partnerships with administrators and school staff. This study explores the interaction among inquiry teams and facilitators that can produce desirable changes in teams' practice and their capacity to build a network of like-minded practitioners. There are three main strands of inquiry research: 1) network analysis that privileges the structural properties of relationships over their content and evolution; 2) macro-level studies that base conclusions about contextual supports for inquiry primarily on surveys; and 3) micro-level ethnographic work that hones in on how individual perspectives drive

inquiry sense-making. Teams' interaction with facilitators impacts the depth of their inquiry work and how it travels to colleagues. Few studies, however, have addressed facilitators' role in inquiry. Previous work has not teased apart *how inquiry teams evolve and how facilitators support them in doing so,* in particular over time and compared to less successful sites.

Inquiry teams play an important role in collecting and analyzing data, and cultivating a focus on student learning. Attempts to explain variation in their outcomes, however, have been spotty and piecemeal. Collaborative inquiry expects that teams model and build out: 1) professional learning communities (PLCs) that develop joint practices and norms; and 2) networks that create trust and positive conceptions around data. The literature suggests that networks and communities of practice are key to understanding and modeling collaborative inquiry. Yet there is a paucity of conceptual and empirical work that links these two perspectives, to better understand how inquiry teams evolve in schools, and what relational supports they require to spread data-based approaches and interventions.

The dissertation explores what links exist between inquiry teams' professional relationships, with one another, trainers, and administrators, and their depth of inquiry implementation. In order to understand changes in teams' structure, practices, beliefs, and inquiry spread, data were collected in middle and high schools over three years, as part of a larger study in a large urban district in the northeastern United States.[1] The schools were participating in a Data and Leadership Program (DLP),[2] as part of a district-wide

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[1] I was able to use these data thanks to the generosity and support of the research evaluation team's principal investigators. I am extremely indebted to them for allowing me to participate in the project and to access its rich resources.
[2] Note that this is a pseudonym.

collaborative inquiry initiative. Data include repeated focus groups, observations, and semi-structured interviews from 12 representative focal schools, and annual teacher surveys from 77 schools, gathered between 2008 and 2010 from teachers, administrators, and DLP support staff. The study focuses on three large case study high schools within the sample, as previous research suggests that comprehensive high schools provide the most challenging and fertile settings to explore the relative success or failure of inquiry reform.

Findings suggest that a strategic facilitator-principal collaboration around inquiry goals, outcomes, and vision is a key driver of inquiry teams' success. Teacher teams are more likely to adopt inquiry practices and beliefs, and develop a network of practice around these, when: 1) teams are heterogeneous with respect to subjects taught and experience, rotate responsibilities among members, and have common planning time dedicated to inquiry; 2) an expert outside inquiry facilitator spends at least two days a week on site and pushes teams to be granular with learning targets and target student groups; 3) the principal distributes leadership and actively supports, legitimizes, and prioritizes inquiry as a vehicle for school change with staff; and 4) assigned individuals or cross-functional data teams support data analysis and dissemination of findings to school staff. With a growing number of districts relying on inquiry-based decision making and instruction, and teams as the projected vehicle to enact this work, this research can help decision makers at different levels guide school improvement efforts.

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CHAPTER 1: INTRODUCTION

Rationale: Collaborative Inquiry Knowledge Base and Gaps in Understanding

Despite contention over punitive roles that data-driven accountability has played

in school closings, teacher evaluations, and student tracking, data are in schools to stay

(Datnow, 2008; Giles & Hargreaves, 2006; Nuthall, 2007). Hundreds of districts have

sounded a call for meaningful data use, one driven by teacher teams who need support in

order to use evidence to discuss students' work and identify skills gaps to address through

instruction (Little, Gearhart, Curry, & Kafka, 2003). Urban schools in particular have

increasingly attempted to adopt collaborative inquiry as a reform "engine" that

encourages teachers to engage in radically new behaviors as members of a team, and to

try on the roles of change leaders, peer coaches, and data analysts (Camburn, Rowan, &

Taylor, 2003; McLaughlin & Mitra, 2005; Young, 2006).

Even with great investments in implementation across large urban districts like

New York, Boston, Atlanta, and Oakland, collaborative inquiry has proven to be a

challenging innovation with variation in teams' depth of practice and inquiry expansion

to colleagues. As collaboration and data use do not typically form part of the preparation

and curriculum that teachers receive, educators are usually not trained to conduct inquiry,

deprivatize practice, or act as researcher-practitioners that lead school-wide change

(Grossman, Wineburg, & Woolworth, 2001; Lieberman & Grolnick, 2005). Several

aspects of the profession further hinder changes in practice and beliefs, such as

autonomy, scarce collaboration opportunities, infrequent evidence use to elicit changes in

teaching, and a focus by teacher preparation programs on skills and training rather than

reflection and culture-building (Lortie, 1975; Stoll & Fink, 1996). Professional

expectations of teachers to use data and become agents of change, however, demand a form of teacher development that is about deep and transformative learning, rooted in evidence and data use, rather than isolated training solely rooted in acquiring new skills (Phillips, 2003; Supovitz, Mayer, & Kahle, 2000; Wenger, 2007).

There is great interest among practitioners and policy-makers alike in the function and spread of collaborative inquiry. A highly regarded line of work in education argues that inquiry can help bring about significant and desirable school changes (Feldman & Tung, 2001; Kerr, Marsh, Ikemoto, Darilek, & Barney, 2006; Nelson, Slavit, Perkins, & Hathorn, 2008; Talbert, Cor, Chen, Mileva Kless, & McLaughlin, 2012; Talbert et al., 2009). We know a lot about some potential inquiry outcomes, like improved student achievement, teacher efficacy, and a culture of collaboration (Barber & Mourshed, 2007; Coburn & Talbert, 2006). Technical and contextual factors that can affect inquiry and data use include accessibility and timeliness of data, perceptions of data validity, technological infrastructure, and training and support for teachers with analysis and interpretation (Lieberman & Wood, 2002; Robinson, Kannapel, Gujarati, Williams, & Oettinger, 2008; Talbert, 2011; Talbert, Mileva, McLaughlin, & Cor, 2010). However, the nature of collaborative inquiry efforts varies, from creating a faculty community of dense interactions, to forming faculty teams focused on inquiry discussions, to allocating experts, to sending staff to off-site trainings, or a combination of these. There are more or less effective means of conducting inquiry. Some initial work finds that facilitators can directly impact the depth of collaborative inquiry that results in school culture shifts and student achievement gains (Gallimore, Ermeling, Saunders, & Goldenberg, 2009; Talbert et al., 2012). There is also some precedence for looking at the structural features of

teacher communities like the density of their interactions (McLaughlin & Talbert, 2006; Siskin, 2011; Yasumoto, Uekawa, & Bidwell, 2001) and the role that professional development leaders and administrators play in forming faculty networks (Atteberry & Bryk, 2010). As a result of the variable quality of facilitators, training, programs, and models, there are also variable inquiry outcomes. Moreover, evidence of the effectiveness of any one of these efforts is primarily suggestive and the relational factors that influence the development of effective collaborative inquiry need far more articulation for understanding and leverage in schools.

A broad empirical base suggests that networks, professional learning communities, and social capital are key relational lenses to examine how collective reforms can shift teachers' commitment to innovation, capacity to operationalize new practices, and leadership and ability to spread these to colleagues (Bidwell & Yasumoto, 1999; McLaughlin & Talbert, 2001). Yet, despite background on the nature of collaborative inquiry and some supporting factors, we know much less about how school teams develop and attempt to grow inquiry, and the role that trained facilitators can play in shaping this work. Relationships matter for inquiry depth and breadth, but there is a gap in the understanding of the interpersonal processes that shape teams' decision-making in enacting inquiry, and of how teams' attitudes and beliefs about teaching, evidence use, and colleagues change as a result of working with trained experts. Many frameworks for understanding inquiry theorize about and provide some empirical support for the importance of interpersonal relations and accompanying structures that shape, influence, and scaffold these (Jonassen & Rohrer-Murphy, 1999; Wenger, 2007).

However, theory has not been applied to model how teacher teams leverage relationships to build a network of colleagues around inquiry.

Inquiry that impacts leadership and practice typically requires experienced mentors with the capacity to guide shifts in teachers' inquiry habits of mind[3] (Talbert, Scharff, & Lin, 2008). Trained facilitators support teachers in using evidence to "go small" and focus questions and data analysis (Feldman & Tung, 2001). Relational aspects of teams' functioning and their work with facilitators matter for inquiry depth and for how inquiry travels to colleagues (Duke, 2006; Gallimore et al., 2009; O'Connell, 2002). However, there is little in the literature to address the important role of facilitators in helping teams conduct and grow inquiry, and prior work needs synthesis and extension. It has not fully elaborated or identified how teams develop themselves and how facilitators support this work, because it lacks comparative cases of inquiry and information on how inquiry efforts develop over time. This study argues that facilitator effects matter: there is an interaction between the composition and dynamics of a team and the facilitator role that can garner desirable changes in practice. This dissertation will add to an understanding of collaborative inquiry, through applying network, PLC, and social capital lenses to examine how teams enact inquiry and get colleagues involved, with strategic support from expert facilitators.

Study Approach

Many studies explore changes in individual teachers' practice as a result of participating in professional development reforms. Yet despite various calls to capture

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[3] Earl and Katz (2006) define possessing "inquiry habits of mind" as engaging in the following practices and beliefs: 1) valuing deep understanding; 2) reserving judgment; 3) tolerating ambiguity; 4) assuming and enacting a range of perspectives; and 5) consistently and systematically posing increasingly focused questions.

such change and the social environment within which it evolves over time, changes have not been traced or demonstrated clearly with a design that's longitudinal (Fishman, Marx, Best, & Tal, 2003; Nelson et al., 2008; Wallace, 2009). Furthermore, few studies have used facilitator, administrator, and group dynamics to examine how inquiry practices, beliefs, and networks develop. This study uses data collected during three years on team, facilitator, and colleague interactions around collaborative inquiry to explore these issues.

The Data and Leadership Program (DLP) implemented by schools in the study focuses on students' learning, rather than the observation of teaching for evaluative purposes, in an attempt to encourage teachers to open up practice and take on leadership roles. DLP is distinct from other data reforms because it pushes educators to empower themselves in the face of data, with which they frequently report feeling "awash" and "flooded." The program provides a potential mechanism for teachers to use evidence themselves, with guidance and modeling from trained facilitators and school administrators, in order to move a specific group of students and build a network around inquiry, rather than receiving imported data from the district or policymakers.

This research aims to articulate the variation and process of teams' development as they inter-relate with inquiry facilitators and in turn, school colleagues. The dissertation leverages relational perspectives to better understand the types of relationships that matter for collaborative inquiry, and how and why they do. The study approaches inquiry from a situative perspective on cognition and learning, that knowing and learning are constructed through participation in the discourse and practices of a particular community, and take place in particular physical and social contexts (Ball & Cohen, 1999; Greeno, 1998). Salient literatures that inform the conceptual framework

are: 1) situative view of inquiry; 2) groups and teams as organizational units for developing inquiry practices and beliefs; 3) networks; 4) social capital; and 5) professional learning communities.[4]

Research Question

The primary goal of the dissertation is to explicate what types of relationships teachers, facilitators, and administrators form around inquiry, and how these influence inquiry work and growth within schools' extant contexts. The study focuses on the following question, pertaining to how and why inquiry-based collaborations vary across sites:

1)   How do school inquiry readiness, inquiry team composition and dynamics, and facilitator-administrator collaboration influence the adoption and spread of inquiry practices and beliefs over time?

   a. How do expert outside facilitators work with site administrators around inquiry?

   b. How do facilitators work with teams and school staff to support inquiry progress as different developmental stages of inquiry?

The study pursues this question with an extensive and rich dataset on collaborative inquiry efforts that spans many relations, teams, and schools over three years, in order to demonstrate what team features and interactions are most effective at deepening and expanding inquiry school-wide. This study applies qualitative, networks, and statistical methods of analysis to develop three-year mixed-methods case studies of the three large high schools in the sample, which progressed to different developmental stages of implementing and scaling inquiry. Qualitative analysis of interview, focus

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[4] See Appendix A for an explanation and excerpt of the literature-coding scheme.

group, learning artifact, work product, and observational data explores how – through co-negotiation, sense-making, and collaborative processes – DLP teams, facilitators, and school administrators, worked to conduct and spread inquiry. Statistical comparisons and networks analyses highlight trends in teams' and schools' aggregate inquiry outcomes over time, and provide descriptive snapshots of schools' inquiry networks of practice in 2008, 2009, and 2010.

Organization of the Dissertation

The dissertation is organized into eight chapters, including this rationale and overview. Chapter 2 provides a literature review, and synthesizes networks, social capital, and PLC perspectives into the situative framework that motivates the study. Chapter 3 outlines methods, including research context, participants, data collection, and analysis. Chapters 4, 5, and 6 are each a longitudinal case study, and Chapter 7 presents comparative analyses and findings. Chapter 8 discusses implications of the findings for research and practice, limitations, and directions for further research.

CHAPTER 2: LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Situative Perspective on Inquiry

Policymakers and educators prioritize data use in decision-making, instruction, and accountability. Data reforms ask inquiry teams to function as agents of change and to build up networks and communities around evidence-based practices, which are not typical of extant school culture. Such reforms expect teachers to adopt inquiry habits, like a learning stance, openness to experimenting with data, identifying target groups of struggling students, designing classroom interventions, and evaluating their effectiveness. Reformers hope that teachers will leverage and build social capital and buy-in of inquiry as a means of school improvement. By definition, inquiry initiatives count on teams to become and build models of practice that grow school-wide. Few studies of inquiry reforms, however, have tackled inquiry from the relational lens of these expectations. This dissertation applies a situative perspective to teams' inquiry and spread, through a focus on the relationships, guidance, and interactions with facilitators and school leaders that shape this work.

Inquiry efforts typically attempt to increase the capacity of school-based teams to better understand data and to use this learning to guide their practice (Copland, 2003; O'Day, Bitter, & Talbert, 2011; Talbert, 2011). This study takes a situative perspective on collaborative inquiry, as the collective problem solving at the core of this effort takes place through participation in the discourse and practices of a team and school community. School-based inquiry teams are tasked with creating a data overview, identifying a target group of students, designing, collecting, and analyzing assessment data, and evaluating the success of self-designed instructional interventions (Boudett,

City, & Murnane, 2005). As teams collectively undertake and attempt to spread this work, certain core practices, like reflective dialogue and deprivatized instruction, shared norms, and socialization structures for new team members, can facilitate the creation and maintenance of an open and supportive professional community (Schwartz, McCarthy, Gould, & Politziner, 2003). When teachers who participate in inquiry collaborate within teams and with colleagues, they are more likely to develop deep inquiry practices and grow to think like leaders and researchers (Franke & Kazemi, 2001; Robinson et al., 2008). This situative perspective grounds this study of inquiry as a process that takes place and is embedded within the shared settings of teams and schools, and that develops through fluid groups and social contexts.

Inquiry Big Picture

Schools that are able to effectively collect, analyze, and reflect upon data can be more effective and improve more quickly than those that do not (Stoll and Fink, 1996). Current accountability is predicated upon the use of data to understand student, practitioner, and school performance, and to use this knowledge to formulate plans for change. However, the fundamental move from conceiving of accountability as "watchdog" surveillance to a toolkit for school improvement, requires a fundamental "mindshift" among the teachers and administrators involved (Earl & LeMahieu, 1997). If data are to have deep and lasting effects in schools, the motivation to use them must be intrinsic. Educators need to be the prime consumers and users of data in the process of making decisions. The supports necessary to bring about this revised view of accountability and data ought to form teachers' and leaders' repertoire for organizational improvement (Bond, 2009).

If data are to become part of the fabric of school improvement, school and district leaders would need to become "active players" in the data-rich environment that surrounds them and to incorporate routines and processes for understanding and acting on data within their institutions of learning (Earl and LeMahieu, 1997). At the same time, teachers need scaffolding so that they can become apt and confident data users and consumers, and infuse this type of data-based decision-making into the daily work of school (Earl & Katz, 2006). At both levels, this shift to school-wide evidence-based practice is not simple or direct. Defining, collecting, analyzing, and sharing data in a useful and actionable way is skill, art, and "a way of thinking" that includes understanding of the nature of evidence itself (Katz, Sutherland & Earl, 2001). Diluvian metaphors abound when describing schools' and districts' data availability. Some note that educators feel they are "drowning in data" (Wayman & Stringfield, 2006); others that they report being "awash" with it (Senge, 1990). Practitioners can rely on data as a helpful force in school improvement, only if they can tease out its relevance, organize it in a meaningful way for their practice, interpret it within this localized context, and utilize it to buttress their decisions. This "human activity" begets culling and organizing information and turning it into meaningful actions (Ibid; Talbert et al., 2010; Talbert et al., 2009). Much of the empirical base focuses on the technical and logistical factors that circumscribe the use of data, with a hat tip to the challenges that this complex process presents. Inquiry and actionable leverage of data for school change, however, depend upon the human activities of sense-making, collaboration, and joint learning, which this dissertation explores.

Although many schools have the capacity to make some progress on inquiry and school culture change through developing a trajectory of evidence-based decision-making, these sites nonetheless face some crucial challenges (Supovitz, Mayer, & Kahle, 2000; Wayman & Stringfield, 2006). First, there can be a lack of preparation for and a subsequent culture of indifference and antagonism towards inquiry (Coburn, Honig, & Stein, in press). Second, even if teachers fold inquiry into their own practice and conceptions of teaching, they face the formidable challenge of involving colleagues in the reform (Huffman & Hipp, 2003; Nelson et al., 2008). In their study of the Bay Area School Reform Collaborative (BASRC, a Bay Area inquiry school improvement model), McLaughlin and Mitra (2005) found that key challenges for "novice [inquiry] schools" included making sense of data, for "intermediate schools" developing inquiry skill and comfort, and for "advanced schools" creating a school-wide culture of inquiry. Not only do baseline conditions of school culture, resource allocation, and priority setting matter for educators growing and spreading inquiry, but so do personnel turnover, structured collaboration time, school and district contexts, and supports for learning and reflecting (Ibid; Talbert et al., 2009). Due to these challenges, among others, collaborative inquiry in schools usually presents a challenge to recruit into, conduct, and spread.

Groups and Teams

Teams' composition, motivation to participate, norms, and dynamics all shape teachers' perceptions, beliefs, and capacity to spread inquiry. The strategy of convening and training one or more inquiry teams to analyze data and design instructional responses, resulted in the use of data becoming an intrinsic component of schools' daily operations (Pinkus, 2008). Team structures, including co-teaching and curricular and

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governance teamwork, also had a significant effect on teachers' organizational commitment (Dee, Henkin, & Singleton, 2006; Young, 2006). White (2005) found that collaboration and mutual accountability within a team were the factors primarily responsible for facilitating data management and decision-making. Teams that created and used inquiry-focused protocol to solve instructional problems greatly increased student achievement and shifted their attribution of improved student performance to teaching rather than external causes (Gallimore et al., 2009). In looking across high schools implementing a team-based inquiry model, Hirota, Buscho, and Cramer (2009) found that the inquiry team structure played a useful role within the school even beyond its designated work.

Teachers talking about their practice and using student work as evidence are important factors for improving practice across the school and building teacher community (Little et al., 2003). By promoting teacher learning in collaborative teams, a principal is far more likely to improve student achievement than by focusing on formal teacher evaluation (DuFour & Marzano, 2009). An extant school culture of collaboration and high levels of focused administrative support are some of the contextual antecedents that can foster teams' development as such professional networks of practice (Little, 2003). Not only can shared work strongly predict rising levels of student achievement, but it has also been found to be a significant predictor of team commitment to reform (Park, Henkin, & Egley, 2005).

Facilitators and Teams

School teams rarely operate in a vacuum and inquiry teams are no exception. Trained outside facilitators who provided ongoing training in leadership, data analysis,

inquiry cycles, and strategies to spread inquiry, were a key component of the Data and Leadership Program's design. This design feature, in fact, was a study variable. DLP's architects based this strategic decision upon lessons learned through practice, which pointed to expert facilitation as a key support for effective inquiry. A facilitator is "someone whose role it is to help a group to work well together in achieving a goal" (O'Connell, 2002, p. 3). Effective facilitators require "pushing" skills to provide direction and definition to a change process so that team participants know what to expect and do; as drivers of change, they also need flexibility, in other words, "to be detached and yet also engaged (Ibid). Although there is programmatic and theoretical consensus around the important role that expert outside trainers can play in helping inquiry take root in schools, the processes behind how these facilitators work together with teams and administrators remain under-explored.

Studies that focus on the supporting role of trained facilitators tend to be limited in scope to: specialists who work with turnaround teams in failing schools around high-stakes and short-lived interventions; and professional developers who provide "one-off" training on- or off-site that typically does not have staying power once teachers return to their classrooms (Duke, 2006; Fernandez, Cannon, & Chokshi, 2003; Hirsch & Emerick, 2006; Lewis & Tsuchida, 1998). Other explorations acknowledge the presence of expert facilitators in a cursory way, as one of several supporting factors that can make a difference for teams' progress on inquiry. A five-year quasi-experimental look at grade-level inquiry teams in nine high schools demonstrated that teams were more likely to adopt inquiry practices and beliefs when they were led by a trained peer facilitator, used inquiry-focused protocols, worked in stable settings, and taught similar content

(Gallimore et al., 2009). The broader empirical base on facilitators suffers from similar blind spots with respect to inquiry. Studies focus on selection and training processes for facilitators prior to their setting foot in their schools, and do not hone in on the exchanges and processes that take place as facilitators actually work with school staff and teams (Ibid; Ward & Tikinoff, 1982).

This dissertation focuses on a longitudinal and on-site reform model that seeks to build staff capacity to conduct inquiry. DLP is predicated upon facilitation that requires intimate understanding and long-term knowledge of the social fabric of teams and school culture. If inquiry is to "stick" in schools and not phase out due to perception as a top-down fad, facilitators' relationships with teams matter, and so does their interaction with site administrators. The latter can legitimize and support inquiry in ways that other staff does not have the reach or social capital to do. Outside experts were trained specifically to address team functioning and to scaffold teams in their efforts to grow work from team to school. Facilitators did not receive explicit or structured direction as to how they should work with site administrators around inquiry, allowing for flexibility in defining and acting upon these relations. This dissertation hones in on the sparsely-documented processes that underlie the collaborative among facilitators, administrators, and inquiry teams, and the relationships that comprise this work.

Conceptual Model

Figure 1 summarizes the conceptual framework that motivates this study. The study posits that all schools, as inherently social organizations, have contexts that are more or less conducive to inquiry. Relevant school attributes include, for instance, a supportive learning environment, experimentation stance, and administrative support.

This dissertation sets out to illustrate how relevant characteristics of inquiry teams, facilitators, and administrators shape inquiry and the school culture within which it takes place. Team composition, dynamics, and norms influence inquiry to varying degrees. DLP facilitators' frequency of exposure to teams and facilitators, how they interpret their roles, and their relative levels of expertise contribute to relative levels of inquiry development. The more or less strategic ways in which principals and facilitators work together around inquiry are also key. Inquiry work, as measured by changes in practices, beliefs, and spread to colleagues, is a product of the dynamic social structure and characteristics of teams. In addition, facilitator-team-administrator interactions are crucial, while taking into account contextual factors and supports.

Figure 1. Hypothesized Effects of Situative Factors on Development and Spread of Collaborative Inquiry

School social factors [inquiry readiness] ↔ Inquiry team composition, dynamics, and norms x facilitator characteristics x facilitator-administrator collaborative → Inquiry practice and spread
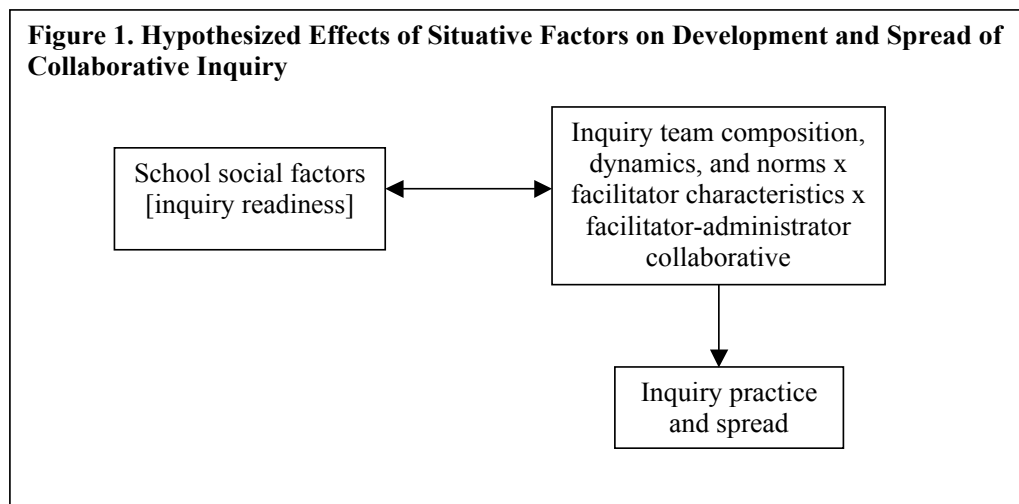
Networks, Social Capital, and Professional Learning Communities as Situative Lenses on Inquiry

Networks Perspective on Inquiry

Educational studies suggest the importance of social interaction in guiding how practitioners choose, analyze, and share data-based responses (Atteberry & Bryk, 2010; Daly, under review, 2010; Moolenaar, Daly, & Sleegers, 2010). Social network theory, in

particular, places the locus of the work of moving relational resources under the direct influence of the social infrastructures within a school (Ibid). A network, therefore, "is a set of relationships which participants imbue with meaning and use for personal or collective purposes" (Fine & Kleinman, 1983, p. 97). As empirical study of networked social contexts has spread to education, a small yet growing body of investigations has looked into how networks can impact teacher commitment to innovative reforms (Penuel, Riel, Krause, & Frank, 2009).[5]

Although social fabrics appear to impact individuals' sense-making of data, "the empirical base is less equivocal about the degree to which the type and quality of social interaction within teams may play a role in data use" (Ibid, p. 3). Data in and of itself and the supports to use it may provide technical cache, but "it is the interaction of individuals around that data that support the meaning making for potential instructional use" (Supovitz, 2009, cited in Daly, p. 4). Technical and structural supports in schools may make a positive difference for data interpretation and inquiry commitment, but there is a human and interactive social element that permeates these and accounts for variation in collaborative inquiry outcomes.

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[5] In addition to a scattering of studies that directly apply networks perspectives and analysis for the purpose of assessing peer effects among teachers, a slew of investigations have imported econometrics analysis to the study of peer influence on students' achievement, using "quality" of peer group as a variable dose. Although most of these studies have in fact confirmed the finding that students whose peer groups are "higher" in quality (as measured by average academic achievement) tend to do better in school, these analyses self-admittedly suffer from the two main issues of peer reflection (if a peer influences a student, that student also influences the peer) and self-selection (when students seek out or are assigned to certain peers because of their potential outcomes (Ammermüller & Pischke, 2006; Angrist & Lang, 2004; Hanushek, Kain, Markman, & Rivkin, 2003; Lefgren, 2004; Sacerdote_2001).
  Scholars have also made headway into understanding adolescent social fabrics, and the important implications of this for students' behavior and achievement in schools. McFarland (2001) found that defiant behaviors arise when instructional formats give students access to public discourse and when students have advantaged social network relations. Furthermore, network conditions can even potentially bring about commitment to a new social identity in adolescents (McFarland & Pals, 2005). Descriptive studies have also delved into students' out-of-school curriculum, and found that their recreational activities index decreases with age and being white, while correlating positively with being female and parents' labor market participation (Bramoullé, Djebbari, & Fortin, 2007).

Even though teams are often the organizing structures in a network perspective on school reform, the literature has not yet explicitly examined or defined them as such. This dissertation argues that we must examine teams as building blocks for professional development networks, if we are to fully understand their evolution as units of change and their internal and school-wide outcomes. Networks permit educators control over their own learning, commitment, and adherence to reform innovations (Mullen & Kochan, 2001; Smith & Rowley, 2005). Each school team has the potential to become and grow a networked community of practice and to develop its own form of social capital around evidence use, or as Daly (2010) proposes, data use as a fluid relational resource.

Evidence suggests that when teachers are supported in building group structures around enacting school improvement reforms, these can take on a life of their own as spaces where educators can set their own agendas for improving instruction, and ultimately commit to and spread this reform more readily. Yasumoto, Uekawa, and Bidwell's correlational work (2001) found that when school departments formed collegial foci, measured as a combination of communication density, intensity of instructional practice norms, and consistency of practice, the effects of teachers' instructional practices on students' achievement increased. When Frank and Zhao (2005) followed up on Bidwell's work on how schools adopt and implement change, they linked the social structure of faculty collegial ties to teachers' reported changes in behaviors and attitudes, and identified subgroups as a meso-level entity in the social organization of schools.

Frank's (1998) work points to several ways of chunking networks within schools, into teams, departments, and other groups, and measuring whether and how these social

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contexts connect to change in teachers' practice and beliefs. The level of macro-analysis consists of considering the effects of different levels of social organizations, like the district, school, and classroom, while the micro-analytic level consists of examining relationships among individuals in their primary social settings (Ibid). Hence, social context is defined: at the macro level of the school, with respect to shared conceptions, goals, and visions, school culture, and decision making; at the meso level, with respect to content area and teams and departments of which the teacher is a member; and at the micro level, with respect to individual teachers.

Social Capital around Inquiry in Schools: Type and Contact of Relationships

Although human capital is a necessary condition for success, it is not sufficient without the social capital provided by interconnectedness (Burt, 1997). Two main conceptions of social capital are prevalent (Borgatti, Jones, & Everett, 1998). One view focuses on memberships in groups (Putnam, 1995) and the other on resource flow, or the idea that an individual has relationships with those people who have knowledge and resources that are most helpful (Burt, 1997, 2004; Coleman, 1988). The former camp conceives of social capital as a characteristic possessed by groups, that is at once cultural and socio-cultural, and includes laws, social integration, and trust (Dika & Singh, 2002; Loury, 1987). The latter school of thought measures social capital as the "value" of an individual's relationships, which provide an actor with power through material, knowledge, and emotional assistance (Brass, 1992; Lin & Dumin, 1986, renamed this social resource theory).

Much of the empirical base has operationalized social capital, whether in affiliational or relational form, as purely a moderator of contexts. This perspective is

limiting, because it ignores the qualitative content of relationships in a network (Sandefur & Laumann, 1998). For instance, in a community of practice, the team quickly achieves "closure" as a dense local network, and because of this there is redundancy in "bonding capital." At the same time, however, if and as team members interact with outside supports and colleagues around inquiry, then through this bridging capital, the team can profoundly change the very context within which it operates. Putnam (2005) identified two types of social capital in his seminal study. Bonding capital refers to the level of internal cohesiveness of a team, and can be measured using indicators of team functioning and dynamics. Bonding capital is relevant for localized agreement and is salient to communities of practice. Bridging capital, on the other hand, refers to networks of practice that extend beyond explicit structures. In the instance of inquiry teams with outside professional development, bridging capital refers to those supports (individuals, curriculum, training) that originate outside of the school, and can facilitate the team coming to an optimal solution that extends beyond localized agreement to outcomes that go beyond the team and can be measured school-wide.

The literature points to two dimensions that circumscribe relationships salient to school-based inquiry teams: 1) the type of relation, with respect to positive or negative referencing and whether it takes place among school colleagues or with an outsider, like a coach; and 2) contact, with respect to exposure frequency and duration (Bourdieu, 1986; Fukuyama, 1995). The majority of studies that have looked into types of relationships, as measured by positive and negative content, have focused on the indicator of trust (Bryk, Camburn, & Louis, 1999; Bryk & Schneider, 2003; Forsyth, Barnes, & Adams, 2005; Louis, Kruse, & Bryk, 1995; Moye, Henkin, & Egley, 2005). Trust comes into play in

situations of risk, rather than those instances where risk is low, extant familiarity among actors breeds interaction, and existing rules can shape behavior (Cook, 2005). As evidence and data use is a relatively challenging proposition in schools, inquiry presents precisely the type of high-risk intervention that is particularly suited for understanding how trust can evolve. Bryk and Schneider's (2003) foundational study on relational trust in schools defined the concept and outlined its benefits and facilitating conditions. In order for a school community to function effectively, it must have agreement in each role relationship among four groups – teachers and students, teachers and teachers, teachers and parents, and all groups with principal – with respect to conceptions held about these responsibilities to and expectations of others.

Follow-up studies, where researchers coded teachers' spontaneous statements for trust, further indicated that teachers' trust in principals was central to their willingness to work with school leadership on enacting new practices for the purpose of continuous school improvement (Louis, 2007). Smaller school size, time and resources allocated to supporting teachers engaged in reform implementation, and trust and respect both from school colleagues and relevant external stakeholders involved with the innovation, were necessary conditions for developing teacher commitment (Louis, Kruse, & Bryk, 1995). Teachers who perceived that they were more empowered in their work environments, and consequently more willing to take on the challenge of engaging with new practices and attitudes, also reported higher levels of relational trust in their principals (Moye, Henkin, & Egley, 2005). Further correlational analysis suggested that a work environment characterized by greater levels of trust was more predictive of school personnel's commitment to innovation, even when controlling for the school's socioeconomic

demographics (Forsyth et al., 2005). Simple access to materials and time for collaboration did not predict change in teachers' practice, while reported access to mentors and specialists did. Teachers were also significantly more likely to change their practice when assisted by colleagues who had already implemented the new reform (Penuel, Frank, & Krause, 2006).

Frequency and duration of exposure that characterize relationships within teams and with other data actors, also impacted commitment to data use (Bourdieu, 1986). Frequency refers to the amount of time spent on the relationship, for example, the number of interactions that individuals have over a finite unit of time around data use (Portes, 1998). Duration is more a measure of "closeness" or intensity, and has to do with the extent of time that the relationship lasted, and has been found to be the best indicator of strength (Marsden & Campbell, 1984). Constructed indicators of strength, specifically that of "time spent," proved valid as they were associated with predictive variables in the positive direction (Ibid). Implicit in all the collaborative models described is a positive network, where social capital arises, predicated upon facilitators, teams, and administrators coordinating around inquiry and spreading knowledge that is useful for school and student well-being. Yet the literature is unclear about how this coordination happens, processes which this dissertation investigates.

Professional Learning Communities

Because inquiry theory of action expects that participants spread inquiry throughout their schools, it is imperative to conceptualize teams not as mere silos of a new practice, but as networked units implementing reform that is intended to reach colleagues school-wide. Emerging research has linked PLCs and networks, in framing

PLCs as networked learning communities. School professional learning communities can serve as important situative structures for inquiry. Effective PLCs exhibit the following characteristics: shared goals, vision, and values; collective responsibility for and collaboration focused on student learning; professional learning and development as individuals and as a group; reflection; a learning stance marked by openness to innovation and risk-taking; networks and partnerships; and relational trust, respect, and support (Bolam, McMahon, Stoll, Thomas, & Wallace, 2005; Buysse, Sparkman, & Wesley, 2003; Clausen, Aquino, & Wideman, 2009; Dooner, Mandzuk, & Clifton, 2008; McLaughlin & Talbert, 2006, 2001). Various studies indicate that data-based decision making, relationships, and risk-taking behavior are among the key factors necessary to define a professional learning community (Thompson, Gregg, & Niska, 2004; Vescio, Ross, & Adams, 2008). This type of community represents a special type of social capital that comes about in part through school leaders' and teachers' design and enactment of network structures, like teams (McCutchen, Scharff, & Talbert, 2010). Education scholars and practitioners conceptualize the structural aspects of community as a "network of structures" or "system of practice," where in turn the type and contact of professional relationships weave a constellation of practice within a school (Halverson, 2003).

When successful, inquiry teams can become their own professional learning communities, or simply formalized networks through which teachers collaborate to improve teaching and learning (Grossman, Wineburg, & Woolworth, 2001). Jackson and Temperley (2006, p. 2), among a multitude of researchers, propose a "new unit of meaning, belonging, and engagement" to accomplish rich professional learning for

teachers, the network. They argue that, as the collaborative and inquiry norms of PLCs elicit a learning stance to external learning through networks, professional learning community and networked learning community are becoming one and the same.

Educational reform networks are ideal contexts to utilize and study new technology, practice, and organization (Lieberman, 2000). They are flexible, malleable, and innovative, with the capacity to forge collaborative groups and environments, focus their efforts, and create agendas that evolve with participants (Rousseau, 2004). Tracing the complex ecology and evolution of these inquiry teams requires a design that is at once longitudinal and multi-layered. Chapter 3 describes the three-year mixed methods study employed in this study. Quantitative and qualitative data were collected to examine how interdisciplinary teams of educators interpreted, enacted, and sought to spread collaborative inquiry through their schools. Analysis focuses on the team as the incubating unit of inquiry work and explores outcomes for both teams and their schools.

CHAPTER 3: METHODS

Research Context: The Data and Leadership Program (DLP)

Data were collected in middle and high schools, as part of a larger study in a large urban district in the northeastern United States. The schools were implementing a Data and Leadership Program as part of a district-wide collaborative inquiry initiative. DLP is an inquiry model deployed in several urban districts, and represents a profound intervention into teachers' work. DLP builds upon lessons learned from previous inquiry initiatives. As such, it involves school teams, with facilitators' support, in using data to develop high-leverage interventions for struggling students and to lead colleagues to do the same. Reform initiatives and policy systems that promote inquiry vary in whether and how they build on research-based knowledge. As DLP is grounded in prior research and practice, it is an ideal context for studying team, facilitator, and school inquiry processes, and one that permits an investigation into how teams' attitudes and practices evolve as they undertake and spread inquiry.

DLP evolved as part of a larger effort to connect leadership preparation to the demands of real world practice. District leaders partnered with university faculty to co-develop DLP as a school improvement and administrative credentialing program. A district-wide mandate for inquiry across schools marked the first year of the DLP. Predicated upon empowerment and leadership around school accountability, the policy sought the creation and support of inquiry teams in all district schools. Each of these teams was charged with becoming expert in using data to identify a change in instructional practice that would accelerate learning for a specific group of underperforming students. The program's theory of change posits that every school has a

group of students with whom the school is currently successful and who are on track to graduate. The goal of improvement is for schools to learn to continually expand this group as responses focused on students' specific skill gaps accelerate their learning.

DLP's features address the key challenges previously identified in research: lack of technical support, incoherence between administrators' and teachers' conceptions of data for evidence-based practice, paucity of trained facilitators who can support teachers in moving from insights of inquiry to changed classroom practices, difficulties in translating knowledge of student learning gaps into instructional responses, and school cultures that are resistant to change (McLaughlin & Mitra, 2005; Talbert et al., 2008). As a result, DLP deploys mechanisms that research has shown to support inquiry and facilitate the establishment of a network and community of learners around practice. Namely, these are: rigorously trained facilitators; data access and support through a centralized data team; school-based data specialists with their own network; timely data access; opportunities for exploration; team design for collaborative learning; and self-reflection activities and opportunities. Thus, DLP has the potential to elicit teams' community building, precisely because it grounds inquiry and leadership in elaborating new practices and attitudes, while recruiting colleagues to do the same.

The Data Inquiry Cycle. "Staying small" is at the core of the program's inquiry cycle, and entails focusing on improving the performance of a small group of struggling students and using this as a "lever for systemic improvement" (Scharff, DeAngelis, & Talbert, 2010, p. 60). DLP's data inquiry cycle seeks to improve student success and build professional leadership to lead school improvement, through three distinct phases. In Phase 1, the program's model envisions that inquiry teams identify and attempt to

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move a small number of under-achieving students. The teams, with guidance from facilitators, data specialists, and support personnel, use student achievement and attendance data to identify a target population of students, a group of 10-20 students within the population, and one specific area of academic weakness. Teams oftentimes move through this step in an iterative way, experimenting with various criteria for group selection and different ways of working with (disaggregating, slicing, and merging) the data. Inquiry teams then establish small, specific learning targets for these students, design and implement a change strategy to achieve these goals, and continually evaluate and revise the strategy based on interim progress measures.

Phase 2 broadens the scope of the inquiry work from students to system, as teams work to ensure that the school continually brings more students into a sphere of success by improving decision-making processes and designing next steps for improvement and assessment. Finally, in Phase 3 teams move to recruiting colleagues to engage in inquiry, through sharing their work and students' results, and establishing partnerships for collaboration around evidence use with fellow teachers.

As previously noted, data are a contentious topic within education, due to the punitive measures with which they are sometimes associated (Cochran-Smith, 2004). DLP, however, is distinct from benchmark-based and other corrective accountability efforts that utilize test data to simply document and report student deficits. The program focuses teachers' work on improving student outcomes and their own use of evidence to assess student learning. Teams identify sub-skills like academic vocabulary that students are struggling with, and design iterative instructional responses and assessments to address these gaps. In doing so, teams open themselves up to self-reflection and use

evidence to probe into the efficacy of their own practices and assumptions. With other "carrot-stick" approaches to using data for school change, student test scores often comprise a finite and dreary end. DLP, in contrast, frames assessment results as the first step in recognizing students' knowledge gaps and designing ways to fill them using evidence.

Data Collection

A rich data set was collected in 77 schools between 2008 and 2010.[6] All schools participated in annual surveys, and a focal group of 12 schools were selected for additional qualitative data collection. For these focal sites, triangulated[7] sources provide insight into multiple perspectives, those of teams, administrators, and data support personnel. The following data were collected: repeated focus groups and semi-structured interviews with DLP teams, administrators, data specialists, facilitators, and district personnel (focal schools); observations of inquiry team meetings, DLP facilitator trainings, leadership facilitator meetings, and inter-school visits (focal schools); surveys of all teachers in focal schools and of 2 to 8 team members in others;[8] and learning artifacts and work products (focal schools).[9]

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[6] I was a member of the research team that conducted an independent evaluation of the DLP, and as such, was able to observe and interview inquiry teams, school leaders, and data support personnel. The team collected data under the auspices of Stanford University's Institutional Review Board (IRB), which must approve Human Subjects Research conducted through the university, and local Department of Education regulations covering research in the schools being studied.

[7] Triangulation here refers to Denzin's (1978) classic elaboration of the term as "'between-method triangulation… the combination of two or more research strategies in the study of the same empirical units'" (Cited in Bloor, Frankland, Thomas, & Robson, 2001). For focal schools only, triangulated sources capture not only self-reports, but also administrator and inquiry support staff observations and school change measured over time.

[8] Survey response rates were generally 80 percent or higher. 2009 had the lowest response rate, hence it is excluded from survey trends, which are primarily concerned with 2008 and 2010 as baseline and final data points of interest. Interview and focus group response rates were approximately 95 percent, with only 7-8 participants missing interviews or focus groups due to illness or scheduling.

[9] Several members of the research team collected inquiry-team and all-school surveys via mail and online, and input respondents' answers into SPSS. Researchers double-checked data and corrected reporting errors,

The study uses a subset of three case study schools to pursue more in-depth longitudinal analyses than is possible with the full sample. Focus is on the three large high schools. Previous scholarly work suggests that the decoupling between reform design and implementation is most rampant in large schools. Many studies point to comprehensive urban schools in particular as "dropout factories" (especially for students of color), where the need to develop ways of reaching out to and involving faculty in new and collaborative practices is greatest and most difficult (Achinstein, 2002; Balfanz & Legters, 2004; Noguera, 2003; Wise, 2008). Studies have found a lack of collegial focus to be more prevalent and pronounced in large schools, which tend to have lower measures of social capital than their small counterparts (Bidwell & Yasumoto, 1999; Powell, Farrar, & Cohen, 1985; Sizer, 1992). National reform efforts have sought to alleviate isolation and a lack of personalization in comprehensive high schools, through restructuring efforts that include Small Learning Communities (Lee & Friedrich, 2007). The large high schools in this study were not immune to these policies and trends. Two of them leveraged DLP to help move to SLCs school-wide and the third had begun experimenting with two SLCs at the time the study ended.

The literature has also demonstrated that DLP facilitators can become much more "embedded" within the life of a large school. They typically work with multiple teams, which results in bridging and a transfer of practices and beliefs (Gallimore et al., 2009). Facilitators in small schools are typically pressed to spread their time and resources

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when entering data, prior to analysis, and as additional data became available. Data sets were merged, resulting in a master set containing survey responses for all three years (2008, 2009, 2010) of inquiry team and all-staff surveys. The team also collected and stored qualitative data on a secure server. All interviews and focus groups were transcribed. When necessary, I used Stat/Transfer (2011) to convert SPSS files into STATA (2007) ones for analysis.

across a case load of several schools. The research evaluation team's final report suggests that the inquiry model is generally less successful in small schools, because they are more likely to already have a clearly-defined culture of collaboration and expectations. In such settings it is more difficult for inquiry to make headway as a "fresh" and innovative way of doing things (Talbert et al., 2012).

DLP's architects had decades of inquiry and school reform experience. They had observed that inquiry tended to take traction as a school-wide improvement strategy primarily in settings that had a relatively stable cadre of staff and administrators. All three case study schools, Jocelyn, Glades, and Inverness,[10] met this scope condition, and had stability in principalship and teaching staff. Each school's principal had led the site for at least five years: 5 at Jocelyn, 16 at Glades, and 13 at Inverness (after a decade as assistant principal at another large high school). Staff turnover was in the single digits or low teens. All teachers were fully credentialed and permanently assigned to the schools. Over 80 percent of teachers had two or more years of teaching experience at their site, and at least two thirds of teaching staff had taught for five or more years. At least 80 percent of staff at all three sites had a Master's degree or higher. All three served student populations that were at least half low SES and one to two thirds minority.

All three sites were comprehensive high schools in 2005 but Glades and Inverness restructured under a federal grant and began inquiry work with the DLP architects with teams in Cohorts 1 (Glades) or Cohort 2 (Inverness). Jocelyn began later (with teams in Cohort 3) with a trained DPL facilitator and in a traditional subject department structure. Glades and Inverness principals were early adopters and were actively involved in designing the DLP work at their schools. Jocelyn's principal, meanwhile, attempted to

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[10] All names are pseudonyms.

replicate Glades and Inverness leaders' DLP success. Glades and Inverness provide

insight into the joint sense-making and relational processes that shaped inquiry into two

different yet successful networked communities of practice, and Jocelyn's approach

offers a purposive comparison case where inquiry did not take off or gain traction within

three years.

Participants

The study focuses on the third cohort of DLP participants, for which the most

complete set of data is available (see Tables 1 and 2 for participants and data collection

details). In 2008-2010, two DLP 3 versions reached 77 schools: 1) an intensive one in 11

schools that prepared teachers to apply for an administrative credential, with weekly

inquiry team seminars run by a trained DLP facilitator, visits with other schools, data

assistance, and support from the school's leadership facilitator;[11] and 2) a regular version

in the other 66 schools with only data and leadership facilitator support, whose teams

experienced inquiry without a leadership certification component and trained facilitator.

The sample of 12 focal study schools and the three case sites selected from these

are representative of the population of 77 schools. All 12 are public schools that form a

representative sample of the district, with respect to geography, grades served (10 are

high schools and two serve grades 6-12 and 7-12), and size (small, large comprehensive,

and large restructured (with Small Learning Communities as well as subject

departments). The schools serve relatively large proportions of minority, immigrant, and

special education students, and all but one are Title 1 eligible. They are also

representative of dimensions that the empirical base suggests are salient to identifying

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[11] Each school has a school facilitator, who works with the principal and staff to support school improvement across a variety of areas. This role is distinct from the DLP facilitator, whose responsibilities are limited to supporting the inquiry teams.

change in inquiry teams' practice, beliefs, and spread, like variation in intensity of supports. Teachers and administrators reported variation in the quality and frequency of facilitation support, as well as relationships maintained with facilitators. The three large schools represent a range of structures and DLP intensity: Jocelyn with a traditional department structure had the intensive inquiry version, Glades with SLCs and departments was also intensive, and Inverness with a hybrid department-SLC organization moved from intensive to regular. Glades and Inverness adopted inquiry through DLP as a school-wide reform engine, under the vision of principals who prioritized and legitimized data-driven instructional responses.

Table 1. 2011 School* Demographics[12]

School	Enrollment	Black	Hispanic	Free/Red Lunch	ELL	Spec Educ	DLP Cohort	Version
Briscol	440	52%	43%	81%	7%	19%	III	Intensive
Cross	400	38%	59%	87%	7%	14%	III	Regular
Drake	430	30%	66%	90%	8%	13%	III	Regular
Ellis	460	40%	58%	82%	10%	18%	III	Intensive
Fridel	400	86%	10%	82%	8%	13%	III	Regular
Glades	3300	40%	22%	76%	13%	8%	I/II/III	Intensive
Hartland	450	21%	60%	95%	31%	8%	II/III	Intensive
Inverness	2500	13%	26%	51%	6%	16%	II/III	Both
Jocelyn	2300	31%	36%	59%	4%	19%	III	Intensive
Krenshaw	200	10%	64%	59%	3%	1%	III	Regular
Lakeside	450	35%	58%	79%	2%	6%	III	Regular
Avg for 11 focal schools	1030	36%	46%	76%	9%	12%	n/a	n/a
Avg for all 77 schools'	463	43%	45%	76%	11%	13%	n/a	n/a

*One of the 12 focal schools closed in 2010 and is not included.

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[12] Data from 2011 district and state school reports, not cited for confidentiality reasons.

Table 2. Description of Data Sources for Analysis (Case Study Schools)

Type of Data	*Number of Items[13] Collected*
Focus Groups/Interviews	93
Teacher(s)	46
Principal	13
Assistant Principal/Data Specialist	5
DLP Facilitator	13
Leadership facilitator	12
Other district personnel	4
Observations	12
Inquiry Team Meeting	6
DLP Facilitator Training	1
Leadership Facilitators Meeting	5
Surveys	3
2008 Baseline, 2009 Interim, and 2010 Exit	
Artifacts/Work Products	104
Class Materials/Products	63
Communication Exchanges	41

DLP teams have at least two members and typically three or four, representing different content areas. Large schools typically defined teams by grade level, generally within departments or SLCs (see Table 3 for DLP team counts in the three large schools). Generally, teams met on a weekly or biweekly basis, but duration, focus, and intensity of meetings varied among schools and teams.

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[13] For a description of types of data collected and a sample interview protocol, see Appendices B and C.

Table 3. DLP/Inquiry Team Counts per Year in Three Large Case Study Schools

School	*2008*	*2009*	*2010*
Glades	7 DLP teams total -29 participants total	10 DLP teams total -38 participants total	14 DLP teams total -53 participants total
Inverness	38 teams total -72 participants total -School transitioned b/w regular and intensive version of DLP, w/idea that every teacher would ultimately be on some type of inquiry team	50 teams total -120 participants total (all school staff)	60 teams total -120 participants total (all school staff)
Jocelyn	2 DLP teams -8 participants total in this cohort	2 DLP teams total -8 participants total	3 DLP teams total -10 participants

Inquiry Roles

As already noted, DLP has two distinct versions, an intensive one with a

certification component, weekly seminar with trained DLP facilitators, and curriculum,

and a regular one without these additional supports. Several inquiry-related roles are

crucial to understanding how teams engage in inquiry and try to grow it school-wide.

They are DLP facilitators, school facilitators, school data specialists (when present), and

principals (see Table 4 for a description of these roles and how they interact with DLP

teams).

Table 4. Salient Inquiry Roles in Schools

Role	Frequency of Interaction w/DLP Team(s)	Content of Interaction w/DLP Team(s)
DLP facilitator	Formal meetings: weekly; informal frequency varies based on how often facilitator is on site and level of support he/she provides	Leads DLP seminars; trains and supports DLP participants in all aspects of DLP work
School facilitator	No formal mechanism/structure in place; frequency varies depending on facilitator's involvement w/DLP and inquiry	Works with principal and school staff more broadly to support school improvement across variety of areas, one of which is inquiry
Data specialist	No formal mechanism/structure in place; frequency varies depending on specialist's involvement w/DLP and inquiry	Provides teams school data and some guidance on data use when necessary
Principal	No formal mechanism/structure in place; frequency varies depending on principal's involvement w/DLP and inquiry	Works with teams on thinking through and executing plans about systems changes in school, how to recruit colleagues, and leadership/apprenticeship training

Each school is assigned one school facilitator who works with the principal and staff to support school improvement across a variety of areas – required by the district policy and centrally funded. This role is distinct from the DLP facilitator, whose responsibilities are limited to supporting the DLP inquiry teams. In addition to this, some schools have a data specialist role, full- or part-time, typically occupied on-site by an existing school staff member. Data specialists also span the entire school with respect to support provided, as usually their responsibilities entail downloading students' data from multiple data systems, sharing this data with colleagues, and assisting with data analysis for individual teachers, content-area departments, and small learning communities. Data specialists, like school facilitators, also facilitate school-wide professional development around data use and related topics. Figures 2 and 3 depict how DLP teams interact with those who support their work in intensive and regular DLP schools.

Figure 2. Inquiry Dynamics* - Intensive DLP School

Principal

School Facilitator

Data Specialist

DLP Facilitator
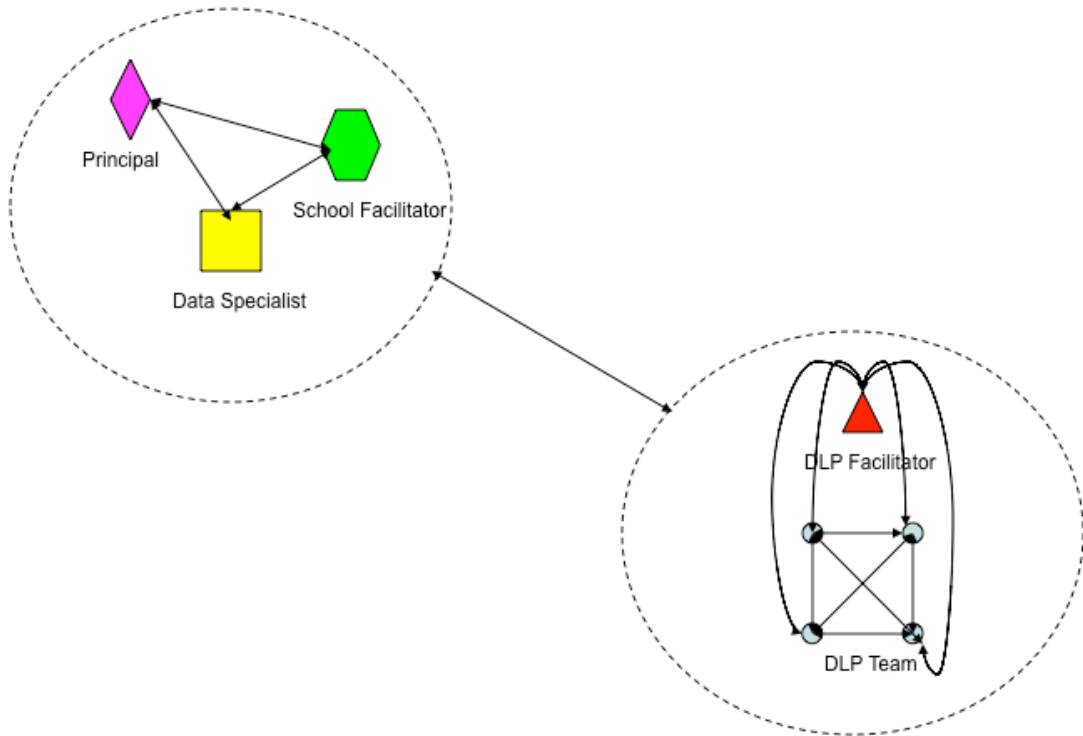
DLP Team

*Note: some schools have multiple DLP teams

Figure 3. Inquiry Dynamics* - Regular DLP School

Principal

School Facilitator

Data Specialist
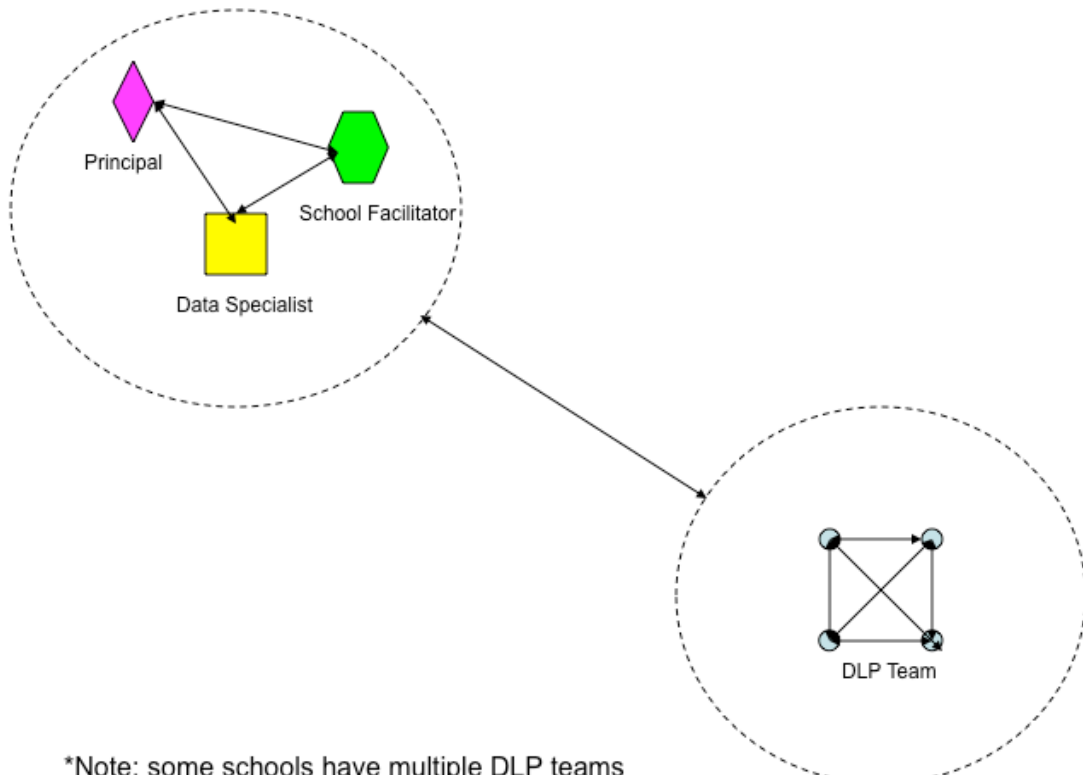
DLP Team

*Note: some schools have multiple DLP teams

Part of the variation in teams' relative success with conducting and spreading inquiry is due to their interface with each of these supporting inquiry roles, and also to how facilitators, specialists, and principals work together around inquiry. For example, in an intensive DLP school, DLP facilitators train DLP teams on a weekly basis. The principal, school facilitator, and data specialist may or may not participate in these meetings and if they do, it is with varying degrees of involvement. In a regular DLP school, the DLP teams usually meet on a weekly or bi-weekly basis without DLP facilitators. School facilitator, principal, and specialist assistance is much more variable.

Data Analysis

The two large restructured high schools in the study have been the most successful at using the DLP model to bring about inquiry-based school reform. The large high school that did not implement the model successfully offers a strategic comparison case. The following question guided research:

1) How do school inquiry readiness, inquiry team composition and dynamics, and facilitator-administrator collaboration influence the adoption and spread of inquiry practices and beliefs over time?

   a. How do expert outside facilitators work with site administrators around inquiry?

   b. How do facilitators work with teams and school staff to support inquiry progress as different developmental stages of inquiry?

Analysis fleshes out how teams develop and interface with facilitators to promote inquiry within schools. Qualitative analysis of interview, focus group, learning artifact, work product, and observational data explores how DLP teams, facilitators, and school

administrators worked together to conduct and spread inquiry. Statistical comparisons and networks analyses highlight trends in schools' inquiry outcomes over time and provide descriptive snapshots of schools' inquiry networks of practice in 2008, 2009, and 2010.

Case Studies

Case-based analyses explore inquiry spread and teams' development and relationships with facilitators, one another, and colleagues. I coded interviews, focus groups, observations, and learning artifacts for reports of change in relational characteristics, practices, beliefs, and spread surrounding inquiry, using the constant comparative method (Charmaz, 1995). NVivo (2010) informed the work to develop the descriptive and analytical codes for analyses. As I developed a catalogue of observed changes in inquiry outcomes, I tabulated their prevalence and coincidence with teams' development and relationships, and produced inductive codes (Strauss & Corbin, 1990). Successive iterations of coding entailed working within each of these categories using the constant comparative method to capture and characterize how teams built up inquiry in their schools, how the relational factors and strategies identified in working with facilitators and colleagues circumscribed this work, and the ways in which facilitators influenced collaborative inquiry.

Coding for Teams' Developmental and Relational Trajectories. I examined changes in teams' development and spread of inquiry, exploring what conditions facilitated and inhibited teams' work and spread in each of the three comparison cases. In tracing the relational process by which inquiry develops, the following questions were most salient: 1) How did inquiry start in and then move through each school? 2) Did one

see a key role for teams and certain characteristics of team dynamics and composition as being central to inquiry? To begin with, how did the following vary with respect to teams' composition and dynamics?

- Common planning and logistical structures in place to facilitate team meetings and collaboration

- Team members' motivation to participate in DLP: credentialing, learning to use data, improving student outcomes, collaborating with colleagues

- Team composition: similarity in years of experience, content areas taught

- Dynamics: frequency of interaction, division of labor, assigning members roles that allow for skill-building in new areas

- Strategies employed to spread inquiry knowledge, awareness, and practices with colleagues

- Pace and comfort with:

  o Examining granular data, for instance, reviewing students' performance on an assessment item by item to identify patterns in errors and what these suggest about the underlying skills that students need and lack to answer the questions

  o Staying small with target groups and learning targets

  o De-privatizing practice

Coding for Facilitators' Contribution to Inquiry Work. The level of support that teams receive from leadership and DLP facilitators, with respect to frequency, type, and quality, can impact the beliefs and practices that enable the collection, analysis, and transfer of evidence. Namely: 1) How did facilitators work with teams to support inquiry

progress? 2) How did facilitators support teams to expand inquiry from the team to the school? 3) What was the role of curriculum, coaching protocols, other inquiry tools, and data support specialists in supporting DLP teams? 4) How did intermediary actors' structural position with respect to the team(s) and school, impact teams' inquiry work and spread? How did the following factors vary with respect to DLP facilitation?:

- Facilitator expertise

- Relational resources facilitator required within the school and from the team

- Facilitator's position with respect to the team and school: did facilitator become an insider or not, and what were implications of this for inquiry work

- Frequency of facilitator's presence at the site and interaction with team members, their colleagues, and administrators

- Whether facilitator was able to establish a strong and strategic collaborative with the principal

- Turnover in facilitators and whether effective knowledge transfer took place

- Was the DLP facilitator clear on his or her role and responsibilities, as distinct from and overlapping with the school facilitator

- Was the DLP facilitator strategic about collaborating with school administrators, and maintaining a collegial yet expert stance with respect to driving inquiry

- Facilitator's support of knowledge transfer among successive cohorts at the school

- Whether the facilitator strategically pushed teams to go small with data, assist with peer coaching, and expand inquiry work to colleagues

Coding for Professional Relationships and Inquiry Orientation within School.

Teachers, administrators, and facilitators come to the table with an extant social fabric that they continually co-construct as they implement inquiry. This school professional culture, comprised of practices and beliefs regarding collaboration, data, and inquiry, can facilitate or hinder teams' development around evidence use to improve instruction. In turn, teams can shape their school's professional culture and inquiry stance as they collaborate internally, guided by trained facilitators, and with colleagues around inquiry. Initial school conditions that can lead to the development of deep inquiry and trust around this work include: risk-taking, a supportive learning environment in which individuals feel "psychologically safe" to speak up and ask for help; high levels of perceived culture of collaboration and common vision within the school; leadership and mentorship that supports teams' self-perception as leaders of inquiry and change in the school; and administrative support to legitimize inquiry as a strategy for school improvement and facilitate teams' outreach around inquiry to colleagues. Specifically, how did the following factors vary among school sites with respect to inquiry readiness, culture, and administrative support?

- Version of DLP deployed (intensive, regular, or transition) and principal's strategy and rationale for this

- Extant DLP participation or the presence and positioning (for example, in leadership roles or as a data specialists) of previous DLP cohort graduates

- Length of school's DLP participation

- Number of cohorts prior to Cohort 3

- Any restructuring on site and if so, DLP's role in this decision and change

- What options existed for units of inquiry spread: departments, SLCs, or others

- Principal's inquiry readiness, learning stance, involvement in DLP trainings, vision for inquiry, willingness to distribute leadership, and skill in doing so

- Administrative strategies that provided teams with the relational resources and legitimacy to support their reach to colleagues

Quantitative Comparisons

The goal of quantitative analysis is to describe differences in schools' outcomes on survey scales measuring inquiry progress over time, as well as network measures of spread.

Verification of Data. Surveys asked participants to answer a series of Likert-scale questions, with responses ranging from 1 (strongly disagree) to 4 or 5 (strongly agree). Appendix D includes a description of items that comprise each scale. The research team validated survey scales via factor analysis and Cronbach alphas (CRC, 2010; Talbert et al., 2009; 2010). Scales have been selected and some renamed, to reflect salient theoretical constructs for this study.

Number of items and Cronbach alphas, respectively, for inquiry scales, were:

- Supportive learning environment: 7 items, alpha = 0.83

- Collaboration on problem solving: 2 items, alpha = 0.75

- Trust and shared accountability: 7 items, alpha = 0.90

- Collaboration on instruction: 5 items, alpha = 0.88

- Collaboration on assessment: 2 items, alpha = 0.81

- Leadership for professional community and network building: 2 items, alpha = 0.89

- Leadership for data-based improvement: 3 items, alpha = 0.93

In order to investigate the dimensionality of the scale, factor[14] (principal components) analysis was conducted, and found that survey items loaded onto common factors (eigen value greater than one). Alphas were then computed for the items that loaded on common factors. Alphas indicate internal consistency of participants' scores on survey items that measured outcome variables. Alpha coefficients for all sets of items were high, suggesting that survey items had relatively high internal consistency. Although alpha values greater than 0.70 can provide evidence that grouped items (comprising a scale) measure an underlying construct, high alphas do not imply that the measure is necessarily uni-dimensional.

Although teams were the main inquiry vehicles, their number was not large enough to permit hierarchical linear or other multi-level modeling appropriate to this phenomenon. Regression analysis was also not appropriate for a nested case. This study is concerned with the inter-relational processes by which teams and facilitators move and spread inquiry through a school. As this work is predicated upon a feedback loop between teams and school, a causal argument is also not applicable or justified by the study's scope and design. Paired (dependent) t-tests[15] were used to determine whether differences in mean values on scales measuring school-wide inquiry outcomes were significant over time.

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[14] Factor analysis is a statistical data reduction method that is used to describe variability among observed variables, by identifying a potentially smaller number of unobserved variables, called factors. For instance, it is possible that variation in several observed variables (survey items) could represent variation in a reduced number (or solely one) of unobserved (latent) variables. Through factor analysis, one can model these observed variables (items) as linear combinations of the potential underlying factor (Child, 2006).

[15] A paired t-test is used when observations are not independent of one other, as when subjects repeat treatment in a longitudinal study. T-tests compare means on repeated measures and p-values test the hypothesis that results would have occurred by chance (Greene, 2012).

Networks. One of the goals of the DLP is to increase not only the sphere of student success, but also the community of teachers engaged in inquiry. This nested connectivity refers to how units in one part of a network (DLP teams) are connected to units in another part (SLCs, departments, or other structures that provide the formal and informal shells to form communities of practice). An affiliation (membership) network models this phenomenon. Affiliation networks are two-mode networks, where modes are actors or events, that describe collections of actors rather than simply ties between pairs of actors. Connections among members of one of the modes are based on linkages established through the second mode. For instance, a DLP team or an SLC would constitute an event and team participants and SLC members would be connected to each other via their membership in the team or the SLC. Affiliation networks allow us to study the dual perspectives of actors and events. Multiple group affiliations with the structural units charged with leading and conducting inquiry in schools are crucial for spreading inquiry school-wide. In an affiliation network, DLP teams and SLCs are events (network nodes), and the ties (edges) that connect them represent shared memberships (co-occurrence). In other words, if two members of DLP Team 1 are also members of SLC 3, then co-occurrence of events between these two units is two. Affiliational models show whether sites grew a network around inquiry practices over time, as well as the relative levels of density of these networks. The denser and larger a network is, the more successful inquiry teams have generally been at spreading their work to colleagues.[16]

Each case study in Chapters 4 through 6 focuses on one of the three large high schools in the DLP study sample. Emphasis is on collaborative and relational processes

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[16] UCINET software is used to model affiliational and other networks (Borgatti, Everett, & Freeman, 2002).

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that have led to contrasts in inquiry progress over time. Rich qualitative and quantitative data allow for documentation of how DLP teams, DLP teams and school facilitators, and administrators co-develop inquiry practices and beliefs. Focus is also on their efforts to spread these school-wide, through changes in school culture, systems of decision-making, and building networks of practice around inquiry.

CHAPTER 4: JOCELYN CASE STUDY

Jocelyn School History and Data and Leadership Program Background

Inquiry is a difficult and relatively novel way of doing things in many schools, and different sites find themselves at distinct stages of inquiry efforts and development. Jocelyn's experience with DLP over three years represents a case of some success in overcoming challenges to inquiry implementation and spread, and great movement around collaboration on assessment. Jocelyn offers lessons to other schools at the beginning stages of experimenting with inquiry and with restructuring into small learning communities as incubating units for inquiry.

The school's principal sought to reproduce the highly strategic and engineered DLP outcomes of other large high schools in the area. There was some misalignment in role expectations among the principal, DLP facilitator, and school facilitator, however, which slowed collaboration down. Despite high-quality facilitation, teams struggled with going small and recruiting colleagues to inquiry. Jocelyn High School implemented an intensive version of DLP with credentialing and Cohorts 3 and 4, starting in 2008. Its principal at the time of the study, Frank,[17] had led the school for over five years, after a successful career as a teacher and assistant principal at another large comprehensive high school. Jocelyn was built in the 1920s and expanded in the 1990s to accommodate a growing student population. Despite these efforts, the school confronted severe overcrowding into the 2000s. Many classes were held in modular buildings adjacent to the main campus. Jocelyn did not begin to experiment with Small Learning Communities until 2009-10, when DLP Cohort 3's work was well underway.

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[17] All names are pseudonyms.

Jocelyn recruited students through several selective programs and provided

academic assistance to others who entered performing below grade level. The school

housed a daycare and offered a tailored instructional program for older under-performing

students. This effort maximized instructional time and entailed teachers going to students

and providing instruction in various subjects in a self-contained classroom. Prior to

formalizing two of its specialized programs into SLCs, Jocelyn also offered training in

medical and information technology and culinary arts. According to the district's college

office in 2005, students overwhelmingly reported feeling safe at school, and 78 percent of

those who graduated attended college.

Jocelyn serves a diverse student body of about 2,300 (see Table 5 for student and

staff demographics). About 31 percent of students are black, 36 percent Hispanic, 26

percent white, and seven percent Asian. Fifty nine percent are eligible for free or reduced

lunch, four percent are English Language Learners, 19 percent have special education

needs, and average daily attendance is 85 percent. About 16 percent of students were

immigrants in 2009-10, a proportion that had doubled in less than two years, according to

state reports tracking school demography. The Department of City Planning found that

the Hispanic population of the area where Jocelyn was located increased by 88 percent

between 2000 and 2010. Its Mexican population experienced a 166 percent growth during

that decade, according to the same source.[18] The principal noted in an interview that "the

square mile of [Jocelyn's neighborhood's city center] has been cited by the federal

government as the number one increasing square mile of Mexican immigrants in the

country." An increasing proportion of Jocelyn's student body is comprised of

[18] Data from Department of City Planning public reports (2011). Website citation omitted for
confidentiality.

undocumented students; for them, attending and paying for a postsecondary education

presents a unique set of challenges.

Table 5. 2011 Jocelyn[19] Student and Staff Demographics

Student Population	*Percents and Counts*
Enrollment	2300 students
Asian	7%
Black	31%
Hispanic	36%
White	26%
Eligible for free or reduced lunch	59%
English Language Learners	4%
Special Education	19%
Average daily attendance	85%
Staff	
Fully licensed and permanently assigned to the school	100%
Two or more years teaching at Jocelyn	95%
Five or more years teaching anywhere	96%
Have Masters Degree or higher	87%
Core classes taught by "highly qualified" teachers (NCLB)	97%

All of Jocelyn's teachers are fully credentialed and there is generally low staff

turnover. Ninety five percent of school staff has two or more years of teaching experience

at Jocelyn and 96 percent more than five years of teaching experience overall. Eighty

seven percent of teachers have at least a Master's degree and 97 percent of core subject

classes are taught by highly qualified teachers, as defined by No Child Left Behind

(2002).

The district assesses school performance yearly, using two evaluation systems.

One focuses primarily on student achievement and moving the bottom third of students

academically, and rates schools on a grade-based A-F spectrum. The second examines

teachers' and administrators' use of evidence to drive school-wide improvement, on a

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[19] Data from 2011 district and state school reports, not cited for confidentiality reasons.

scale of development and proficiency. For the several years preceding the study, the

school had maintained Bs and Cs on the district's evaluation system focused on student

achievement and moving the bottom third of students academically. Jocelyn had received

a well-developed rating on its use of evidence to drive school-wide improvement.

External Partnership with DLP Architects and Internal Restructuring

Administrative leaders at Jocelyn did not have a previous relationship with DLP

architects and facilitators. The principal's spouse held a leadership position at Inverness

and alerted him as to what DLP was and the success it had met with there. At the time,

Frank wanted to build a culture of evidence use at Jocelyn and to create capacity among

his staff to collaborate around instruction and take ownership over students' learning. In

2008 he commented that:

> What I was really hoping for with DLP is to start to train teachers to kind of own
> certain programs. My phrase that I keep telling people is: "If nobody owns it,
> nobody takes care of it." And that's kind of the syndrome that I've been trying to
> change, to get more both supervisors and teachers aligned in a way to support
> each other and allow them to…work together so that they're not all spread out.

On the one hand, he expressed a desire to train teachers at Jocelyn to engage in

collaborative inquiry. At the same time, he wanted to proceed with caution and began by

informally researching potential solutions that had been effective at other sites through

word of mouth. Both his spouse, an Inverness administrator, and Anne, Inverness'

principal, had spoken to him on numerous occasions enthusiastically and in great detail

about the high-leverage success that DLP had met with at their school. Frank interacted

on a regular basis with Inverness' and Glades' principals at principal network meetings.

They both shared challenges to and strategies for growing inquiry at their schools with

him. Frank looked into the program and reached out to the DLP architects on his own. He

had seen how successful his colleagues had been at using DLP to build a network of collaborative inquiry and evidence-based practices in two other comprehensive high schools, one of them a neighboring one. He decided to launch DLP as a similar vehicle for change at Jocelyn.

DLP 3 Teams and Parallel Inquiry Teams at Jocelyn

When the two DLP 3 teams began work in the fall of 2008, Jocelyn had a limited history of using inquiry for whole-school change, but great administrative desire and backing to attempt to do so. Table 6 illustrates the trajectory of two DLP cohorts at Jocelyn, and their relationship to non-DLP inquiry and data teams at the school. In 2007, the year before embarking on the DLP, the principal had designated an assistant principal (AP) of data and technology as data specialist for the school, and had formed a data team comprised of this AP and four teachers.[20] Team members examined standardized assessment data and put together recommendations for interventions to put in place for some struggling students. Despite the team's analytical success, members did not systematically share findings with the rest of the staff. The team did not link analysis to identifying a target group of students or specific skills to address. Although the data team collaborated effectively around using assessments to identify students who were in trouble and suggest some supports for these students, work stalled when it came to eliciting colleague buy-in and implementation of interventions.

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[20] As noted in methodology Chapter 3, in 2007 the district issued a mandate for inquiry across all schools.

Table 6. Jocelyn DLP Cohorts, 2008 – 2011

DLP Cohort	Dates	Teams and Participants	Data Specialist	DLP Facilitators	School Facilitator
n/a	Apr 2007 – present w/ turnover in composition	5 participants 1 team total: 1 Data Team	AP of Data & Technology on Data Team	n/a	Works very closely with principal
3	Feb 2008 – Dec 2009	13 participants 3 teams total: 1 Data Team & 2 DLP teams	Same	Started w/one facilitator and transitioned to a second; finally joined 2 other large schools' seminars at different site	Same
n/a	Feb 2009 – Sep 2010	21 participants 4 teams total: 1 Data Team, 2 DLP teams & 1 non-DLP inquiry team	Same	n/a	Same; does not work as closely with principal and DLP facilitator, following conversations w/DLP architects
4	Sep 2009 (piloted 2 SLCs) – Jan 2011	23 participants 5 teams total: 1 Data Team, 3 DLP teams & 1 non-DLP inquiry team	Same	New facilitator	Started w/same; then new facilitator b/c previous left organization in 2010

Table 7 illustrates the timeline of DLP 3 teams and simultaneous non-DLP

inquiry teams at Jocelyn. Both DLP Cohort 3 teams were somewhat homogenous with

respect to content areas and number of years of experience (a majority of participants had

three to six years). Initially the cohort began work with eight teachers on two teams of

four members each. Team 1, "the math team," had three math teachers and picked up one

social studies teacher, after losing one member whom the others described to be

"particularly abrasive" to maternity leave. Team 2, "the English team," remained intact,

with three English and one science teacher, several of whom were very good friends

outside the workplace. Cohort 3 teams received weekly training from the DLP facilitator,

as at other sites. They experienced a change in facilitator, however, as the first facilitator

went on medical leave partway through their training.

Table 7. Jocelyn DLP and Data Inquiry Teams, Fall 2008 – Spring 2010

T(ime) 1: Fall 2008	T(ime) 2: Spring 2009	T(ime) 3: Spring 2010	After study: Spring 2010 – Spring 2011
~11% of Jocelyn teachers[21] involved in inquiry	~18% of Jocelyn teachers involved in inquiry	~19% of Jocelyn teachers involved in inquiry	~19% of Jocelyn teachers involved in inquiry
0 SLCs	0 SLCs	2 SLCs	2 SLCs
3 Inquiry Teams total -1 Data Team -2 DLP 3 Teams	4 Inquiry Teams total -1 Data Team -2 DLP 3 Teams -1 non-DLP Inquiry Team	5 Inquiry Teams total -1 Data Team -2 DLP 3 Teams -1 non-DLP Inquiry Team -1 DLP 4 Team	5 Inquiry Teams total -1 Data Team -2 DLP 3 Teams -1 non-DLP Inquiry Team -1 DLP 4 Team
13 DLP 3 and data team participants total	21 DLP 3, data team, and inquiry team participants total	23 DLP 3, data team, inquiry team, and DLP 4 participants total	23 DLP 3, data team, inquiry team, and DLP 4 participants total
One school-wide Data Team (5 members) -AP of Data & Technology -Science teacher -Social Studies teacher -Math teacher/Dean -Literacy coach ((members are DLP supporters but have no common meeting times w/DLP teams) Two DLP 3 teams w/8 participants total DLP 3 Team 1 (4 members): -Math teacher -Math teacher -Math teacher -Social Studies teacher DLP 3 Team 2 (4 members): -English Language Arts teacher -English Language Arts teacher -ESL teacher -Science teacher	One school-wide non-DLP inquiry team (8 members) -AP of supervision -AP of supervision -AP of supervision -AP of supervision -AP of guidance -AP of data -School Facilitator -Principal Intent was that each department represented would form its own inquiry team starting Sep 2009 (this did not happen).	One DLP 4 team w/5 participants (3 dropped out leaving 2) DLP 4 Team 3 (5 members) -Dean (dropped out in first week) -Math Special Education teacher (dropped out second week) -Special Education teacher (dropped out third week) -Special Education teacher -Nutritionist	0 teachers signed up for DLP 5

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[21] Proportions of Jocelyn teachers involved in inquiry were computed by adding the number of all teachers participating in inquiry during the given school year – both through DLPs and non-DLP data inquiry teams (and only counting once teachers involved in inquiry through both mechanisms) – and computing the percentage they represented out of a staff of about 120 teachers.

The two DLP Cohort 3 teams embarked upon identifying target student groups and using data to select learning targets. During this inquiry cycle phase, they had limited collaboration with members of the data team, due to a lack of common planning time. The data team and DLP teams also shared little overlap with respect to data examined and target groups of students. There were no antecedent DLP cohorts in place at the school. Hence, the third cohort pioneered Jocelyn's efforts at inquiry independently and without an existing network of support.

DLP 3 participants represented four content area departments – math, English, social studies, and science. However, they did not leverage their subject department social capital to the fullest extent possible. DLP 3 participants did reach out to content-area colleagues to share inquiry work, but there were not systematic attempt to drum up support and expand use of evidence-based practices school-wide. Some DLP 3 members were younger teachers who expressed feeling uncomfortable sharing their work with fellow teachers until they were further along in the inquiry process. The DLP facilitator corroborated that Jocelyn's departments had an entrenched culture that was resistant to change. Frank also noted that some DLP 3 teachers were not sure of their footing as "low man on the totem pole" due to seniority issues.

In addition to the two DLP 3 cohort teams and the data team already in place at Jocelyn, two other inquiry teams came together during the study. First, in spring of 2009, as DLP 3's first year of work was winding down, the principal formed a school-wide non-DLP inquiry team, comprised of APs, himself, and the school facilitator. The goal of this team, after going through inquiry training, was to have APs start their own inquiry teams within their content-area departments. This did not come to pass. Jocelyn did not

have the necessary "critical mass" of teachers who were familiar with and immersed in inquiry, and could follow along with and participate in DLP-style inquiry. Short of this level of evidence-based practice at the teacher level in the departments, the non-DLP inquiry team members would have had to train teachers on inquiry from scratch. As these APs had not received DLP or inquiry training of any kind, this level of capacity building and professional development was not possible.

The fifth and final inquiry team that formed at Jocelyn – in addition to the data team, two DLP 3 teams, and school-wide non-DLP team – was the eventually disbanded DLP Cohort 4 team. Three of the five Cohort 4 members dropped out of the program during the first several weeks, due to the intensity of the time commitment and difficulty of assignments. Relations between the remaining two team members and DLP facilitator at the time grew very strained. The teachers reported a lack of support and abrasive communication style on the facilitator's part as alienating them from the work and preventing them from making progress on inquiry.

Inquiry Roles: DLP Facilitator, Principal, and School Facilitator

Jocelyn's DLP facilitator, Laura, entered her role with a wealth of experience as a high school teacher, researcher, and professional development provider. Laura's organizational affiliation was with a university and an intermediary organization. DLP's architects came from both organizations and forged a partnership to implement the program at school sites whose administration selected it as a school improvement model. Carrie, a DLP architect who trained all DLP facilitators and was Inverness' DLP facilitator for several years, trained Laura and was her mentor. DLP architects actively recruited DLP facilitators who had both teaching and administrative or research

experience in K-12 education. Less important was facilitators' previous experience with inquiry, since DLP architects had developed a train-the-trainer model that Carrie and her successors executed with great fidelity. Per that end, Laura had taught for over five years in a high school that was small but similar in student and staff composition to Jocelyn; had provided instructional training to other teachers for several years; and was working towards an advanced graduate degree under Carrie's supervision focusing on inquiry teams when she got involved with DLP as a facilitator. She did not have school administrator experience, as some of the other DLP facilitators did. Thanks to her affiliation with Carrie, however, she had a greater level of access and exposure to inquiry training than some of her colleagues.

Laura quickly built a great rapport and open channels of communication with DLP 3 participants. They widely praised her for being knowledgeable, readily available, and a great resource. According to them, "she's helped us out a lot. A *lot*. I don't think I would know half this stuff. She makes it very interesting…She's amazing…If she doesn't know how to do it, she gets someone in there to do it for you." Laura was constantly accessible to her cohort of participants, who reiterated that "she has given us every means of communication" and "she knows exactly where we stand," with respect to the progress of the inquiry work. Laura was developing her own repertoire of inquiry expertise, which she shared with her teams and they readily recognized and appreciated. However, perhaps due to a lack of site administrator experience, she did not take a strong leadership stance in her interactions with the principal and the school facilitator.

Several logistical and interpersonal issues complicated Laura's ability to become an insider at Jocelyn, and to develop an intimate understanding of school systems and

culture. To begin with, her contract was for one partial day of support at Jocelyn per week due to family reasons (less than the two or more days per week that facilitators at other large schools spent on site). This factor curtailed her time at the school and ability to gather information about relevant events, to check in with DLP participants, the school facilitator (Samantha), and principal, and to embed herself in the routines of the staff. Due to Laura's limited time at the school, Samantha's interference, and Frank's consent, the original training set up at Jocelyn was different from the norm of the DLP model. Laura only ran DLP seminars and worked with DLP 3 participants on peer coaching. Samantha ran the leadership training component of the program. This was not the case at other sites, which aligned much more closely with DLP's intended design specifications. Typically, the DLP instructor would also do team coaching and one-on-one leadership development with the team members. In many cases, the principal would co-facilitate or at least participate in these portions of the training seminars.

As Laura observed, the deviation at Jocelyn "kind of complicated things, especially because [Samantha] didn't go to the DLP trainings." The lack of clarity around what their roles were, how they would overlap, and how they should share responsibilities resulted in a series of misalignments in vision and planning. In addition to limited communication on account of logistics, Laura's sentiments, which Samantha also echoed were: "There was some I think probably misunderstanding in terms of…or just misalignment or nonalignment in terms of what she was doing and what I was doing, and her understanding of the DLP stuff…I never was really clear on 'what *is* [a school] facilitator?' I didn't know what her job was."

These concerns came to a head after an intensive summer planning session in 2008. At this point Laura enlisted Frank's help in increasing her time at Jocelyn to two days a week. She was particularly concerned about having this extra time to develop a better understanding of what was happening at the school, and to manage the interpersonal dynamics that impeded DLP team 1's (the math team)'s capacity to move inquiry forward. Laura noted that:

> I also felt like it was important for me to do the leadership coaching in addition to the team coaching, because there were a lot of team dynamics that were being affected by individual leadership issues. With one person in particular. And that was something that everyone agreed. And so this year I'll be at the school one additional day. And [the principal] wants me to work with…the school facilitator.

In 2008-09 the DLP facilitator, school facilitator, and principal began to communicate more frequently around specific expectations and responsibilities for their roles. They focused on how to work together to provide guidance to DLP participants. Laura worked primarily with the DLP teams and Samantha with the data team, which was an additional source of confusion. Collaboration between the two sets of teams was lacking and they had no common planning time together when the 2008-09 school year began.

Despite sincere attempts by the inquiry leadership team – the principal and two facilitators – to increase communication, clarity of roles and vision, and collaboration, differences in coaching stances and styles between Laura and Samantha resulted in friction well into 2008-09. A key component of DLP work entailed experimenting and iterating with instructional interventions and the assessment of how effective these were. Samantha's style was a somewhat more prescriptive one than Laura's, and occasionally resulted in discrepancies in feedback to DLP teams. For instance, Laura would encourage them to test out and evaluate the effectiveness of their ideas. Meanwhile, Samantha

would press them to move on to a different idea if she felt based on her experience that the one proposed would not be effective.

During this time, Frank decreased his attendance of DLP meetings, increased reliance on Samantha with managing non-DLP school matters, and began meeting with Laura on a weekly basis to get updates on DLP teams' progress. Frank noted in 2009 that from his perspective his weekly updates with Laura were very helpful, "because she…lays out what she's looking to do with them, and it allows me to get a better understanding for the times when I *won't* be there, and also chime in with how it applies here at school." He leveraged this one on one time with the DLP facilitator in order to get a better sense ahead of time of what she would cover with DLP 3 participants during the seminars. He wanted to strategize ways in which he could support her work with the teachers during the training and their efforts to spread inquiry when she was not on site. According to him, he valued this interaction for building up his capacity as a leader to legitimize and support teachers in expanding inquiry to colleagues: "that interaction was very important and missing last year in the beginning. And that was on me more than Laura."

Jocelyn's principal believed that DLP was important to changing the culture of the school to an evidence-based one, but did not develop a strategy for how this would take place. He had Laura lead the charge on DLP, did not attend DLP trainings regularly, and when he did, occupied the role of a passive observer rather than an active participant and role model. When friction arose between Laura and Samantha, he intervened to give Laura the space to run DLP trainings as she saw fit, but otherwise had limited involvement with the training aspects of the program.

Frank was liked and respected as a leader. DLP participants and other school staff described both the DLP and school facilitator as advocates and sources of support and expertise on inquiry and other issues. However, Laura, Frank, and Samantha never quite came together as a collaborative team around DLP and inquiry, did not share an ordeal by struggling through the steep learning curves of DLP together, nor did they present a unit with a common vision around inquiry to the staff. The school facilitator's over-active involvement in certain aspects of school management and the principal's lack of involvement in DLP and trainings resulted in a lack of cohesion, collaboration, and common vision around inquiry that was vital and necessary for its success and spread. After Laura left the school to train DLP Cohort 4 facilitators, a new DLP facilitator began work with Cohort 4 Jocelyn teachers. The group fell apart citing the difficulty of the program and amount of work it entailed, with the remaining two participants clashing greatly with this facilitator over her communication style and coaching (a perspective shared by Frank as well). In 2010 Jocelyn's school facilitator Samantha left the organization altogether, in part due to conflicts with upper level district leadership around her over-involvement in some aspects of school leadership.

Team Dynamics and Motivation to Join

The principal and his leadership team put out applications and spoke with potential DLP 3 participants, which resulted in a group of 18 interested potential participants. As teachers learned more about the time commitment and demands of the work, that number dwindled down to the eight who would ultimately participate in and complete the intensive version of the program. According to one of the participants: "We were pretty much introduced to this idea that data was going to play a *big* role in the

school and in our classes as well. And even last year I think a lot of questions were asked about how we use data in our classrooms. So we kind of saw that whole thing coming. And so I guess it just kind of made sense when we got together with DLP." While the connection between the principal wanting to move to a more data-driven environment and participating in DLP was clear, what was less so was the leadership component of the program. DLP participants noted that:

> The way that the burden and…pressure [were] put upon us…I'm still a little puzzled… you know, this is what you heard: "You get credits above your master's…and… you'll be working with the kids in your school"…And then a leadership program…And then no details about what exactly we're going to be doing, how you're going to get the credits.

Communication from school leaders about the content and perks of the DLP was somewhat scattered. This multitude of messages resulted in confusion as to what the ultimate incentives and outcomes were for being a part of the program: to earn advanced credits, become eligible for credentialing, work with their own students, or be leaders of change at the school. Although some DLP participants cited an interest in occupying administrative positions as a motivating force to participate, none of them had done so within a year after completing DLP.

Of Jocelyn's two DLP teams, the math one experienced more turbulence and turnover than did the English one, and this delayed the team's progress to identify target students and hone in on learning targets. Three team members who were all math teachers consistently reported that it was very difficult to work with their fourth team member (which the DLP facilitator and members on the English team also observed), a social studies teacher who left DLP partway through for maternity leave. According to the DLP facilitator, regarding team dynamics: "the one kind of real challenge has been

the person who took the leave of absence…On various occasions at least one of her team members has come to me said, 'Look, I have a really hard time working with her.'"

Laura approached the difficult team member during the teams' summer intensive planning session to discuss her abrasive communication style in private. Laura asked her to be more mindful of the tone she used in addressing her colleagues, if she wanted to be heard and not alienate them. According to Laura, "her reaction to me I felt like epitomized the issue. You know, *her* problems. And her reaction was, 'Why are you only talking to me?'" After this attempted coaching intervention, the team member withdrew and refused to participate in the rest of the planning session.

Despite efforts by the DLP facilitator to intervene in and manage the situation, this particular teacher had a dominant personality that undercut her team's progress and dynamics. She became negative about components of the inquiry process that she was not comfortable with, and this barrier to understanding spilled over into one of her team member's approaches towards the program. When the teacher described above left, another social studies teacher took her place. This departure alleviated the personality conflicts that had pitted the previous social studies participant against her colleagues. However, micro-factions still persisted on this team, due to cliques based on department (math and social studies), age and tenure at the school (one of the math teachers was substantially older than other team members), and politics (one of the math teachers was being groomed for a leadership position at the school). After the departure of the member that others had characterized as the "problem child," despite persisting inter-personal divisiveness among team members, they were able to begin honing in on target students, learning targets, and interventions to implement in the classroom.

Team 2, the English team, was much more harmonious and did not experience turnover. When one of the team members reflected on interpersonal dynamics, she observed: "I'm really lucky. I'm friends with all of these people outside of school. So there's an openness that I don't know if I could say if it was other people I would have with them…These are my people." Team members distributed work equitably and checked in regularly with each other to see whether anyone felt unfairly over-loaded and if so, how they could support and help each other. As one teacher observed, their friendship outside of school actually worked to the benefit of the team's efficiency and distribution of responsibilities, rather than its detriment: "[sometimes] you're more likely to defer responsibility when you know that someone you know can handle it, or 'she's really plan oriented, she won't mind doing this.' But there's really not that."

Other Team 2 members also reported a fair distribution of responsibilities. This is in contrast to Team 1 participants, who noted that even after losing their problematic member, the team still divided roles according to perceptions about the things at which each member already excelled. This strategy curbed members' ability to step outside their comfort zones and engage with learning all the skills required to conduct DLP effectively on their own. Finally, an additional point of contrast between the two teams was that once they had agreed on selecting literacy as a focus for their target students, Team 2 (the English team) provided support to Team 1 (along with Jocelyn's literacy coach), which produced some inter-team friction as well.

Teams' Inquiry Work and Relational Supports

The two DLP 3 teams initially struggled with obtaining the relevant data to investigate their students' credit accumulation. They cited the support of their school

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facilitator in this instance as invaluable in connecting them to the literacy coach and others at Jocelyn who could help obtain this data through various departmental connections. One participant pointed out that attention to the content area imbalance in team composition could have alleviated some of these issues: "A lot of these problems would have been avoided if the teams were set up differently… And I think if there was more introduction before the tests were actually assigned…I think that I really was unfamiliar with creating a test to test something I was really unfamiliar with, finding a target group, looking up the things."

The teams ultimately decided to focus on building up students' literacy skills. Math team members reported feeling that they were at a content area disadvantage since they did not have the relevant expertise that English team teachers did to design and carry out literacy interventions. Several math team members asserted that if teams had been set up from the start to each represent a broader spectrum of subject areas, this would have increased the likelihood that each team would have at least one member with content knowledge corresponding to targeted sub-skills and direct access to target students in the classroom. Composing DLP teams is one of the leadership roles that principals play. Unlike at Glades and Inverness, Frank did not strategize around the DLP cohort selection process at Jocelyn.

The math team struggled with the ultimate literacy focus that both teams selected. Partway through 2008-09 the teams received common planning time, which greatly aided their efforts. During this year, and with Laura's continued and consistent support, they defined a target group of students as sophomores who had fallen below the credit accumulation threshold necessary to be on track by the end of freshman year. Through

data support from colleagues who were APs of relevant departments at Jocelyn, they obtained and examined 7th through 10th grade performance data for their target group of students. They then honed in on reading comprehension (literacy) as the sub-skill their instructional interventions would target. Additionally, Samantha provided the teams some assistance with low inference transcripts, as they began to observe one another's classrooms. According to one of the Team 2 participants:

> I was teaching literacy along with [fellow team member]; [another team member] had ESL classes; and a lot of my literacy kids had [another team member] for science. So we were able to test them using different testing strategies. It was actually a good way for us to learn what grade level they really were, [because] when we get the exams from the eighth grade sometimes the kids can be tired, there can be an off day. So just by getting a lot of those assessments in, it really helped us learn what kind of kids we had.

As DLP 3 participants examined specific assessment items and sections, they used their analyses to try out different instructional interventions with their students. Interventions were eye-opening with respect to underscoring precisely what skills students lacked that teachers had not considered were missing. A persistent roadblock for both teams, however, was getting access to the individuals in their own building and beyond who could get them the data they needed. One of the math team teachers observed:

> I think the challenge is that we don't have the access that the administrators do to the data. That's a huge challenge. Which is understandable—because if anything does happen with a grade or any changes happen, they could be responsible for it. But it's also hard on our part, because we need some of that data.

The teams relied on the school facilitator's and principal's relationships with the district data office to facilitate this work. Neither Samantha nor Frank, however, helped to build bridges directly between DLP participants and district data and assessment personnel. Teams struggled with acquiring the necessary data, drilling down to sub-skills and learning targets, and gaining comfort with implementing data-driven interventions. Some

team members did report that they relied on student data to differentiate instruction and group students heterogeneously (based on skill levels) in their own classrooms. These practices, however, were not consistently implemented. In addition, teams' data-based decision making was limited in scope and action. This meant that their communication out to the rest of the staff did not necessarily accurately capture practices associated with the data inquiry cycle.

In 2009 math team members felt that they were more on track than the previous year: "It seems like we know where we're going— where, before, we didn't." The first semester of the program held its own unique set of challenges for teachers, as they struggled to get a firm grasp on what DLP was about. For instance, teams analyzed data iteratively in order to understand "What's a sub-skill?" and "How do you identify that sub-skill? What does it really mean?" For Jocelyn teams, this portion of the inquiry cycle took up the first semester of the program. They leveraged their grasp of sub-skills, learning targets, and target groups to begin designing interventions to implement during the 2009-10 school year.

The Team 2 science teacher noted the ways in which going granular with data had changed her own approach to teaching and what she did in her classroom:

> There's really been a paradigm shift…I definitely use way more data than I used to. I'm way more likely to give a quick snapshot analysis question. The idea of meeting with other teachers to discuss a student. And also the idea of fine brain changes. That these are these little things that you're going to get the biggest bang for your buck from, are sometimes way more effective than a whole complete curriculum overhaul or initiative.

School Culture and Inquiry Network

Despite success in adopting inquiry-based practices and beliefs for themselves, Jocelyn's DLP 3 participants met with great resistance and limited traction when it came

to spreading inquiry school-wide. Several factors contributed to this standstill and a key one was a school culture that was highly resistant to change. Even the DLP facilitator, who did not consider herself a Jocelyn insider, observed:

> There's some tension. What I keep hearing is that there's a lot of culture to get through in [the] school. There's a real kind of strong culture of…I don't know what! But that's one of the reasons why I think [the principal], in particular, and I felt like I just needed to be there a little bit more—because I don't know what's going on at the school and I needed to know more about what's happening, who are the people, what are the dynamics there.

The principal articulated this issue of culture more specifically as a general resistance to change among staff: "They're very resistant to change…two years [ago]…one of my assistant principals…said at a meeting [at another school], 'Well [Frank]'s not going to go to Small Learning Communities, because he knows the assistant principals won't let him.' So that's kind of the mentality."

DLP 3 members noted that despite their best efforts, they had not spread word of DLP as much as they would have liked. Participants widely acknowledged that the first step to expanding inquiry would be to get more staff involved in DLP, and at least aware of what the program was and what they were trying to accomplish. DLP 3 participants were prompted about whether they shared DLP work in their departments, smaller and more comfortable structures to broach a new practice. They admitted about their colleagues:

> Right now the only thing that they know is probably from just comments we've made in passing within our departments…I don't think that they get a big picture…I know last year when they introduced it they didn't really open it up to the whole school…they asked the APs maybe if there was a couple of targeted people in their department they thought might be interested…Now…they sent out a memo again opening it up to the entire school and see who would be interested.

Several factors contributed to limited inquiry spread at Jocelyn. As explained earlier in this chapter, many DLP 3 teachers did not feel comfortable sharing inquiry work, because they were younger, less experienced, and untenured. They did not believe they could elicit colleagues' buy-in of new practices and beliefs that were grounded in evidence use. This factor, combined with a well-documented pattern of resistance to change, in particular within subject departments (which at Jocelyn offered the only incubating units for DLP), brought the raising of awareness around DLP to a grinding halt. In addition, there was a lack of administrative and principal leadership and strategic thinking about how to create teams and use DLP to build their capacity to lead inquiry-based improvement. This lack of urgency in driving change presented a challenge to building a dense inquiry network at Jocelyn.

DLP participants conducted staff-wide professional development meetings where they presented their data work and literacy interventions, in the latter half of the program. The principal also attempted to advertise DLP 3's work more widely and to drum up support for Cohort 4 participation through some staff meetings. Yet, these efforts were not consistent or systematic. Frank did not legitimize and reinforce DLP as a lever of change. Neither he nor the APs provided leadership and scaffolding for DLP participants with the rest of staff, the majority of whom were not interested in or resistant to DLP. School leaders did not clearly communicate to non-DLP teachers that inquiry participants were working towards school-wide improvement and were focused on student learning rather than entering classrooms for evaluation.

Constraining Conditions for Inquiry Network Development. One of DLP's goals is to increase not only the sphere of student success, but also the community of teachers

engaged in inquiry. This nested connectivity refers to how units in one part of a network (DLP teams) are connected to units in another part (SLCs, departments, or other structures that provide the formal and informal shells to form communities of practice). Jocelyn did not establish a network or connectivity around inquiry, nor did the school spread inquiry on a large scale. Several factors contributed to this plateau of outcomes, all of them relational in nature. First, at the particular stage of inquiry development where Jocelyn was in 2008, the school lacked the deep and strategic relationship with DLP architects to develop an understanding and strategies around the full potential of DLP as a lever for school change.

Next, the inquiry leadership team, comprised of the principal, DLP facilitator, and school facilitator, had a difficult time in coming together as such. The DLP facilitator was not allotted enough time at the school to become an insider. There was not a clear delineation of roles, joint planning or vision around inquiry, or development of strategies to leverage DLP as a school-wide mechanism of change. This leadership team did not engage in shared learning around DLP, co-run or jointly attend DLP meetings, or project themselves as a unit of legitimization and support for DLP that participants could lean on for help. The principal treated DLP with passive approval. He did not participate in DLP meetings or legitimize DLP work as a systemic strategy for improvement that he wanted to drive practice. Jocelyn's culture was highly resistant to change. This fact, the principal's lack of signaling, and DLP participants' inability to raise enough awareness about their work, brought inquiry to a standstill.

There were no SLCs when DLP 3 began. This structure could have provided incubating units for inquiry, as traditional content-area departments at Jocelyn and other

large high schools had already proven ineffective. There was no existing culture of inquiry. Leadership from previous DLP cohorts was missing. There was a data team in place prior to DLP 3, but its efforts were scattered. So were attempts to establish non-DLP inquiry teams, whose work was disconnected from DLP teams' and did not take root in subject area departments.

Figures 4-6 represent Jocelyn's inquiry network in 2008, 2009, and 2010. At this stage in Jocelyn's inquiry arc, there was not a network or significant change in density around inquiry over time. Jocelyn piloted two small learning communities halfway through DLP Cohort 3's work, as structural units to support inquiry growth. Four of DLP 3's participants were involved, three as SLC members and one providing additional data support. DLP connections with the second SLC were limited. Despite the SLCs being well-received and still in place at the school today, the restructuring did not expand beyond the two communities. DLP 3 teams met with success in forging themselves as communities of practice with bonding capital, in particular through collaborating around assessment. They struggled to create bridging capital with school staff as a whole. It is clear from the figures that the different inquiry teams at Jocelyn – data team, DLP 3, and school-wide inquiry team – functioned as isolates from one another, and hardly leveraged relationships or shared connections via common members to bridge their work and share inquiry knowledge.

Figure 4. Jocelyn Network/Shared Memberships Around Inquiry, Fall 2008

Figure 5. Jocelyn Network/Shared Memberships Around Inquiry, Spring 2009
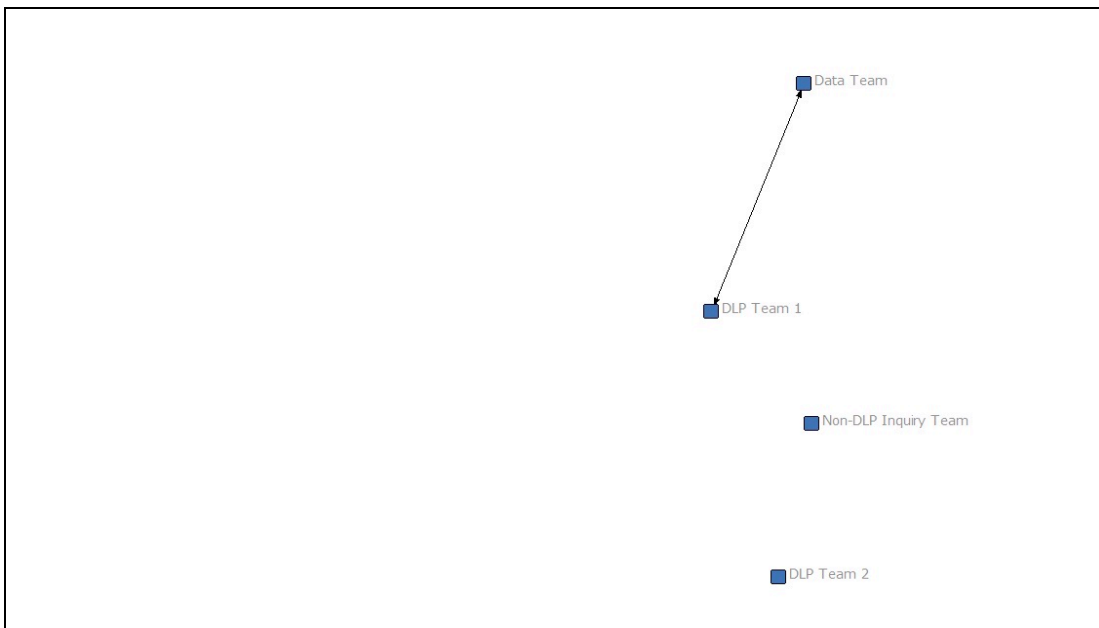
Figure 6. Jocelyn Network/Shared Memberships Around Inquiry, Spring 2010
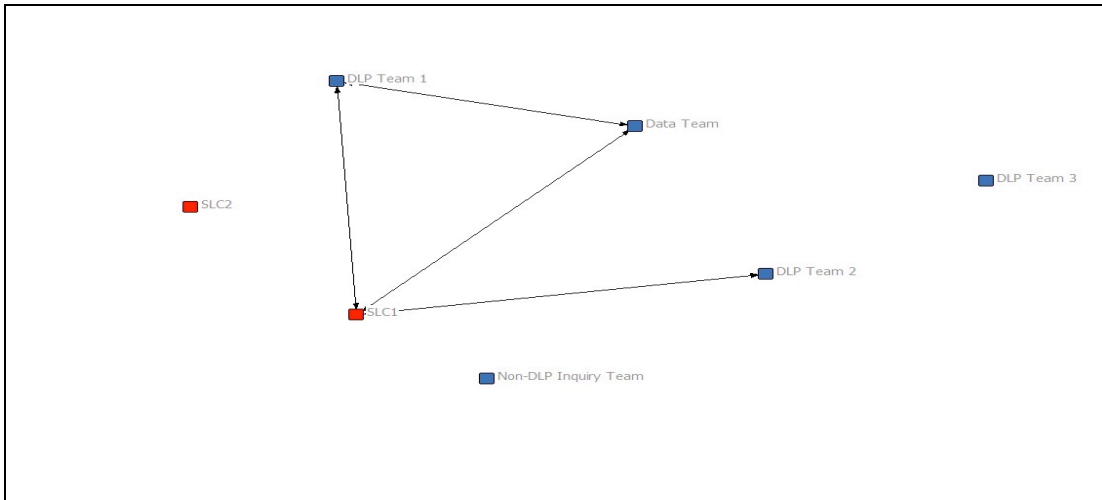
School Inquiry Measures

There was an initial jump from 11 to 18 percent of school staff involved in inquiry between 2008 and 2009. This proportion plateaued at 19 percent in 2010. Following a high attrition rate for Cohort 4 participants, who cited an intense workload and other commitments as reasons to leave, and severe conflicts between remaining participants and DLP facilitator, staff did not sign up for Cohort 5 onwards. All Cohort 3 participants graduated from the program and did not pursue leadership positions. Extensive qualitative evidence corroborates these trends. Paired t-tests assessed whether differences over time in mean values on scales measuring school-wide inquiry outcomes were significant (Table 8 shows a comparison of differences).

Table 8. T-Test Results Comparing Inquiry Outcomes Across Time: 2008 to 2010

Outcome Measure	M1$_{2008}$	M2$_{2010}$	Mean Diff	t	P-value
Supportive Learning Environment	3.07 (0.09)	3.01 (0.08)	-0.06	-0.65	0.26
Collaboration on problem solving	2.50 (0.10)	2.38 (0.10)	-0.12	-1.06	*0.09
Trust and shared accountability	3.81 (0.10)	3.77 (0.09)	-0.04	-0.43	0.67
Collaboration on instruction	3.46 (0.11)	3.63 (0.10)	0.18	1.52	*0.07
Collaboration on assessment	3.62 (0.12)	3.86 (0.10)	0.25	2.06	**0.02
Leadership for professional community and network building	3.48 (0.11)	3.70 (0.11)	0.21	1.54	*0.06
Leadership for data-based improvement	3.81 (0.09)	3.97 (0.09)	0.16	1.56	*0.06
*p ≤ 0.1, **p ≤ 0.05, ***p ≤ 0.01					

T-tests detected a negative significance for collaboration on problem solving.

They also detected significant increases in school-wide averages between 2008 and 2010

for collaboration on instruction and assessment, as well as leadership for professional

community and data-based improvement, which are also foundational practices for DLP.

This trend was most likely also connected to momentum from the two SLCs piloted at the

school. As Figure 7 illustrates, the school experienced a decline on supportive learning

environment, collaboration on problem solving, and trust and shared accountability

between 2008 and 2010. These findings are in line with an overall plateau in network

connectivity and inquiry spread and activity at Jocelyn.

Figure 7. Scale Averages in Jocelyn, 2008-2010
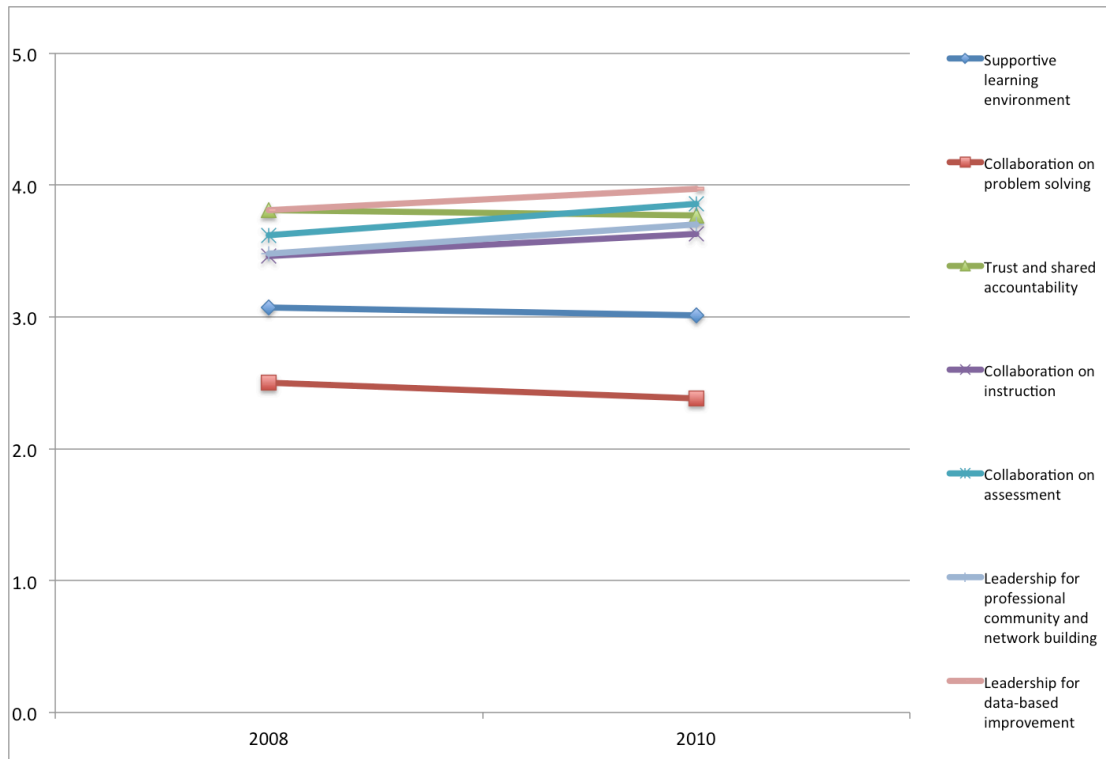
Looking Ahead and Conclusion

Jocelyn's DLP 3 teams and the school as a whole met with great success and improvement on collaboration around assessment. This is one of the most challenging evidence-based practices to execute and is a roadblock for many schools attempting inquiry. At the same time, DLP 3 participants struggled with combatting the entrenched resistance to change and to complex new ways of doing things at the school. DLP 3 teams at Jocelyn did not enjoy the leverage of new structures like SLCs emerging school-wide, which could serve as dynamic units to incubate and spread inquiry. Inquiry participants also forged their own path as leaders of inquiry at the school, as the principal did not legitimize or advertise inquiry in an active way. These DLP 3 cohort members at Jocelyn set some work in motion that could potentially have taken off school-wide.

DLP and inquiry, however, did not become as widespread at Jocelyn as DLP 3 efforts poised them to become. Frank wanted to use DLP to distribute leadership and instill a sense of ownership and accountability for evidence-based practices in his staff. He undertook a restructuring pilot by crystalizing two of the specialized programs the school offered into SLCs in fall of 2009. However, DLP 3 members were not SLC leaders, so the strategy behind this re-organizing move is unclear. He investigated supporting and constraining factors to implement and grow DLP inquiry in other large high schools. He did not, however, adopt the strategy of simultaneous school-wide restructuring into small communities and DLP implementation that had proven successful in other settings. Frank was anxious about jumping into a school-wide shift without piloting first. This decision limited the organizational structures available for DLP spread in Jocelyn to traditional content-area departments. According to Frank, Jocelyn's DLP and school facilitators, and DLP Cohort 3 participants, these departments had entrenched cultures. They lacked an inquiry stance and the drive to engage in iterative and experiential learning. DLP 3 teams thus lacked some of the supports present in other settings. Finally, the inter-personal dynamics among the principal, DLP facilitator, and school facilitator, limited traction and spread for DLP and inquiry work school-wide. These factors included a lack of consistent communication and articulation of expectations.

DLP Cohort 3 teams struggled to access and analyze data in a timely fashion to hone in on target students and sub-skills for interventions. Although they received high quality DLP facilitation, there was not a clear strategy or vision conveyed from the inquiry leadership team about how to leverage DLP and inquiry as catalysts for school-

wide improvement. Little advertisement to colleagues about DLP successes coupled with a strong resistance to change among Jocelyn staff. DLP 3 members began to open up their classrooms to each another, but there was no systematic deprivatization of practice at the school, departments, or SLCs. The emerging SLCs provided an opportunity to connect inquiry to smaller instructional units. Although the principal had a vision for distributing leadership around inquiry and DLP, this level of accountability and ownership of inquiry work by staff did not grow school-wide. Attention turns next to Glades High School. Glades represents a more advanced stage of inquiry development, where professional community development around inquiry was a key leverage point for increasing the school's evidence-based practices and collaboration around data.

CHAPTER 5: GLADES CASE STUDY

Glades School History and Data and Leadership Program Background

At Glades, DLP drove the principal's evolving strategy for school-wide

improvement. Two DLP facilitators, a Glades administrator credentialed through DLP

and an experienced outsider, worked intensely with teams to move through inquiry cycles

and improve student outcomes. The principal and facilitators struggled through bumps in

the road around trainings in order to elaborate a successful partnership. Together, the

three strategically used DLP to restructure the school into SLCs and leverage these to

build broad leadership for and communities of practice around inquiry.

Glades High School has had the longest involvement with DLP, including the

program's intensive certification component, of all 77 schools in the study. Its teachers

and administrators were part of the pilot DLP Cohort 1, launched in 2004, with one other

large and two small high schools. Glades is the largest high school in the study and one of

the largest in the city, serving approximately 3,300 students across nine Small Learning

Communities (SLCs).[22] The school restructured into communities and shifted guidance

counselors into SLC-specific positions in 2006-07, as a result of participating in the DLP

pilot.

The comprehensive high school's doors opened in 1971. Due to the fact that it

was constructed in an "open-classroom period," Glades accommodated resource areas in

what later became four of the learning communities. These spaces facilitated teachers'

interaction and collaboration, including opportunities to discuss students' progress and

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[22] School leaders designed nine SLCs, which each serve a maximum of 450 students, and have their own unique themes, courses, teachers, and counselors. Seven are profession-based communities, with a focus on careers like teaching, arts, medicine, law, and business. One SLC serves solely incoming ninth-graders considered at academic risk, through individualized interventions, and the other works with freshmen in general. About a third of the school's students are enrolled in Advanced Placement courses.

bring them together for supplemental academic supports. As of the 2012-13 school year, the same principal had led Glades since 1996. The school was known as one of the most violent ones in the city in the early 1990s. By the end of the 1990s, during the principal's first five years, there was a significant decrease in violent incidents. One of the principal's first decisions was to hire an Assistant Principal of Safety and Security, who worked at the school for five years.

In 2011, Glades boasted a highly diverse student population (see Table 9 for student and staff demographics). Its student body was 40 percent black, 34 percent Asian, 22 percent Hispanic, and three percent white. Seventy six percent of students were eligible for free or reduced-price meals, 13 percent were English Language Learners, eight percent were classified as having special education needs, and average daily attendance was 85 percent. A large percentage of students were first-generation immigrants and many would be first generation college-goers. The principal holds a long-term commitment to making sure that the diversity of the staff reflects the diversity of the student body as closely as possible. Glades has always been a neighborhood school, and a growing percentage of teaching staff is comprised of alumni, up to about 12 percent in 2010, "so they have commitment to the school, to the community, to the kids."

Table 9. 2011 Glades[23] Student and Staff Demographics

Student Population	Percents and Counts
Enrollment	3,300 students
Asian	34%
Black	40%
Hispanic	22%
White	3%
Eligible for free or reduced lunch	76%
English Language Learners	13%
Special Education	8%
Average daily attendance	85%
Staff	
Fully licensed and permanently assigned to the school	100%
Two or more years teaching at Glades	80%
Five or more years teaching anywhere	66%
Have Masters Degree or higher	85%
Core classes taught by "highly qualified" teachers (NCLB)	88%

All of Glades' teachers are fully credentialed and there is generally low staff turnover. About two thirds of DLP participants indicated that moving into a leadership position at Glades so they could stay in the school was their primary choice upon graduating. Eighty percent of school staff has two or more years of teaching experience at Glades and 66 percent more than five years of teaching experience overall. A majority of the teachers, at 85 percent, have at least a Master's degree and 88 percent of core subject classes are taught by highly qualified teachers, as defined by No Child Left Behind (2002).

As described in Chapter 4 on Jocelyn, the district uses two evaluation systems to assess schools' performance annually. The first system focuses on student achievement and moving the bottom third of students academically, and rates schools on an A-F spectrum. When the third DLP cohort of teachers began its work in 2008, Glades had

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[23] Data from 2011 district and state school reports, not cited for confidentiality reasons.

increased and maintained its performance on the first evaluation by an entire "grade" (C to B) for two consecutive years. The school also maintained the equivalent of a highly-developed rating on the second type of evaluation for the previous two academic years.

External Partnership with DLP Architects and Internal Restructuring

Glades has a long-term and generally positive collaboration with DLP architects, as well as the trained DLP facilitators who worked with inquiry teams in the school. Under the principal's leadership, Glades collaborated with DLP leaders to plan and execute the school's restructuring from traditional content-area-based departments into Small Learning Communities. This change took place in the 2006-07 school year.

According to the principal and staff involved with the first two DLP cohorts, in 2004-05 and 2006-07, respectively, the program played a crucial role in the decision to restructure and in supporting the restructuring process. DLP served as a vehicle for a cultural shift, as it provided a way for teachers to collaborate around specific students' success, via evidence and formative assessments. This work in part prompted Glades' re-organization into Small Learning Communities, which provided the formal structure and space for teachers to engage in similar collaborative inquiry with the goal of moving all students into a sphere of success. According to Glades' administrators:

> So, through that process, what came as one of the assignments—(and this is really where inquiry began)—was "identifying the target group within your…school"—(so each of the four schools had to target a population that the school was struggling with)—"and to begin doing some research as to why that group was struggling." Now it really seems so simple when you say it; but at that time it really was novel.

When the DLP 1 participants and school administrators, who were involved in the inquiry process from the start, examined their school's state evaluation, they identified Hispanic male students as an academically struggling subgroup. Participants noted that:

Really, using the data sources that were only available then, we were essentially looking back at the kids' records. But it began a look-back that a high school would have never made before, looking back to kindergarten, seeing "Did the kid ever perform well in school? Where was the break in school performance? Did the kid fall apart when they were making the transition from elementary to middle, or from middle to high school? Or was the kid always a struggling kid from the time that the student entered school?" and have conversations with the student as to why they see that they're struggling in school, what resources were they availing themselves to in the school.

As DLP 1 participants designed individualized interventions to help struggling students they had identified using evidence, they began structured conversations with students about their success. Many students echoed a lack of awareness around existing academic and social supports in the school. The principal described this as a wake-up call for personalization, "You may *think* you're user-friendly, but you have no evidence that you really are." Collection of empirical evidence on-site and the opportunity to visit and observe the two small DLP 1 schools prompted change. Glades restructured into SLCs and moved counselors into the communities. This shift sought to create a level of teacher collaboration and individualized student attention that the large school had been struggling to provide.

The principal and other Glades staff echoed the sentiment that restructuring was a worthwhile yet challenging transition. Prior to re-structuring, Assistant Principals (APs) of content areas worked with teachers in their areas and reported on progress directly to the principal. When SLCs crystallized, so did the newly-minted positions of SLC directors, who now reported to the principal and were charged with moving students and supporting teachers in doing so. Transitioning to an SLC format was particularly difficult for APs, as they had to carve out a place within the new organization.[24] Their authority

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[24] Note that this is a direct contrast to Inverness High School's re-structuring, where SLCs absorbed departments and former department heads (AP equivalents) were re-assigned to head up SLCs.

was undermined, as they still evaluated teachers on content but did not have a role in the new unit of organization for the school, SLCs.

Glades' ultimate goal was a network matrix organization, where the content-area APs would support the nine learning communities with subject expertise. What immediately ensued, however, was a struggle for authority. One of the APs left and the rest stayed, but re-focused their efforts on "academics, professional development, and learning," resulting in general satisfaction among the majority within one to two years of restructuring. All SLC heads are teachers (about half in English) and DLP 1 or 2 graduates, with a triad collaboration in which APs supervise and work closely with SLC heads and guidance counselors. This strategy has allowed for holistic conversations and work surrounding individual students to take place, which were neither frequent nor systematic prior to DLP 1 and restructuring.

SLCs, supported by DLP Cohorts 1 and 2's initial work, laid the structural foundation that facilitated the impact and inquiry spread of DLP Cohort 3's efforts. From teachers' perspectives, the transition took about three years, with self-selection into SLCs during the 2005-06 planning school year. Teachers' identification with and ownership of their communities increased somewhat in 2006-07, with limited intra-SLC movement. SLC composition and buy-in stabilized in 2007-08, the year before DLP Cohort 3 began work. The communities were generally characterized by positive relationships and collegial rapport. Both administrators and teachers independently and repeatedly confirmed this. In the first year of the study, 2008-09, only three of about 170 teachers requested a change in their SLC. The result was a baseline SLC matrix that allowed for the subsequent evolution of SLC-based inquiry teams alongside DLP ones. The

principal's restructuring strategy had created an SLC-unit-based structure through which

inquiry could potentially spread, where no such organization had existed before.

Teachers' buy-in of re-structuring was an important part of the history predating

DLP 3. It is important to understand perceptions of the inter-play between restructuring

and DLP that DLP 3 participants who had "lived through" the transition to SLCs

communicated. According to a DLP 3 participant, the change between pre-restructuring

and DLP 3 and SLCs:

> Is like night and day. When I first went into teaching and [came here]…one of the things that I found a little bit [overwhelming] was the numbers of kids…It was very difficult to identify who was who. And you knew every term you'd be getting a whole new set of kids more than likely. Accountability was very difficult…Staff-wise there was a tendency to be very kind of secretive…it was very difficult for new teachers to find out and inquire from older teachers exactly what you did, and there was a tendency I think for more individuality, more independence among teachers.
>
> So teaching became very difficult. You were struggling in the classroom as a teacher and you were struggling with the kids to teach. Since [DLP], everything changed. It just reduced. First of all, being broken up into small learning communities, you felt you had more control. I mean you know your kids, the kids know you. Now people are listening to what you have to say because we are discussing a common student, we have a common goal and a common purpose…But now, because it's much smaller and we are way more involved, when we have our common time meeting we can discuss anything! "There's this student. Do you have this student? This is an issue. What do we do?" Also there is a lot more sharing…we're looking more as teachers at students, and we're comparing and rating ourselves more with the students rather than against each other.

Moving to SLCs constituted a deliberate move to increase collaboration and

individualized attention paid to students. One of the strategies to facilitate this work was

building in daily and weekly common planning time for teachers. According to one of the

DLP 3 participants:

> With the SLCs…there's a greater focus on meeting students' needs. In common planning time…there's a greater focus on the children because there are fewer

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children in each SLC…There's a whole lot more placed into trying to get the child on grade level, trying to get those deficits on grade level prior to referral. And you have teachers within that SLC working—it's not departmentalized, it's not Social Studies and English, there are teachers from all genres, different academic backgrounds that are working with the children and trying different strategies.

Extant Glades Inquiry and Introduction of DLP 3 Teams

When the four DLP 3 teams began, Glades had a history of using inquiry for whole-school change, administrative legitimization of inquiry, and DLP 1 and 2 graduates in administrative positions, as SLC directors, APs, and data specialist. DLP, however, was by no means a wide-spread or well-known strategy for school improvement. As many DLP 1 and 2 graduates had busied themselves with the daily routines of teaching and running SLCs and departments, there was a gap in broader inquiry spread. Furthermore, developing the capacity to conduct this type of work hinged on continued training provided by trained DLP facilitators.

My analysis examines the collaborative inquiry work of DLP Cohort 3, for which the most complete set of data is available. Table 10 describes the history of five DLP cohorts in Glades.[25]

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[25] Previous research found that Glades had not only been successful at moving DLP 1 and 2 graduates into leadership positions within the school, but also at helping to create a culture of inquiry and conditions for spread (Talbert et al., 2010).

Table 10. Glades DLP Cohorts, 2004 – 2011

DLP Cohort	Dates	Teams and Participants	Post-Program Participant Outcomes	Data[26] Specialist	DLP Facilitators	School Facilitator
1	Jun 2004 – Jun 2005	5 participants 1 team	1 participant dropped out 1 passed away 3 became APs at Glades	DLP 1 participant	DLP architects	Works closely w/principal, but not involved with DLP
2	Jan 2006 – Jun 2007	12 participants 3 teams	11 became APs and/or SLC directors 1 is still a teacher at Glades	Position created	1 outside facilitator (left in 2008 to start new school)	Works closely w/principal; weak DLP facilitator
3	Jan 2008 – Dec 2009	12 participants 3 teams	12 participants registered to take state certification exam	Same	1 DLP 2 graduate who was AP; 1 outside facilitator	New facilitator; also not involved with DLP
4	Sep 2009 – Jan 2011	9 participants 3 teams	9 participants planning on taking state certification exam	Same	Same school and DLP facilitator	
5	Jan 2010 – May 2011	15 participants 4 teams	15 participants planning on taking state certification exam	Same	Same school and DLP facilitator	
Total	n/a	53 participants	51 participants still at Glades	n/a	n/a	

     An examination of the trajectory of DLP 3 teams' inquiry work showed that their

progress varied. Figures 8-11 show differences in teams' outcomes on previously

validated survey scales over time.[27] Team 1 generally started out at higher levels on most

measures than team 2 and on about half than team 3, and showed moderate progress on

reported levels of supportive learning environment and leadership for data-based

improvement. Team 1 reported great changes in collaboration on problem solving and

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[26] Principal was actively involved with DLP across all cohorts and worked with DLP teams during their training seminars.

[27] 2009 had the lowest response rates and hence least reliable coverage of three years of survey data collection. Only team averages from 2008 and 2010 are reported and used, as response rates for both years were 75-100% and they represent baseline and final data points of interest.

instruction and in leadership for professional community and network building. The team

stalled, however, with respect to trust and shared accountability and collaboration around

assessment.

Figure 8. 2008 and 2010 DLP Cohort 3 Team 1 Survey Measures

Figure 9. 2008 and 2010 DLP Cohort 3 Team 2 Survey Measures

Figure 10. 2008 and 2010 DLP Cohort 3 Team 3 Survey Measures

Supportive Learning Environment: 2008 = 3.5, 2010 = 2.5
Collaboration on problem solving: 2008 = 3.8, 2010 = 2.5
Trust and shared accountability: 2008 = 4.2, 2010 = 3.2
Collaboration on instruction: 2008 = 4.7, 2010 = 2.8
Collaboration on assessment: 2008 = 5.0, 2010 = 3.0
Leadership for professional community and network building: 2008 = 4.5, 2010 = 4.5
Leadership for data-based improvement: 2008 = 5.0, 2010 = 5.0

Legend: 2008, 2010

Figure 11. DLP Cohort 3 Teams 2008-2010 Change on Inquiry Survey Measures

Reported Change on Five-Point Likert Scale

Supportive Learning Environment: Team 1 = 0.2, Team 2 = 0.1, Team 3 = -1.0
Collaboration on problem solving: Team 1 = 0.5, Team 2 = 0.1, Team 3 = -1.3
Trust and shared accountability: Team 1 = 0.1, Team 2 = -0.1, Team 3 = -1.0
Collaboration on instruction: Team 1 = 0.6, Team 2 = -0.4, Team 3 = -1.9
Collaboration on assessment: Team 1 = 0.0, Team 2 = -0.3, Team 3 = -2.0
Leadership for professional community and network building: Team 1 = 1.0, Team 2 = 1.0, Team 3 = 0.0
Leadership for data-based improvement: Team 1 = 0.3, Team 2 = 0.1, Team 3 = 0.0

Legend: Team 1, Team 2, Team 3

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Team 2 had generally lower baseline levels than team 1. Team members reported slight decreases in trust and shared accountability and collaboration on instruction and on assessment. However, levels of supportive learning environment, collaboration on problem-solving, and leadership for data-based improvement showed moderate gains. Reported gains on leadership for professional community and network building were greatest, and at the same level as Team 1's.

Evidence for team 3's progress was mixed, in comparison to the other two teams. The team started out at the highest baseline of all three teams on about half the scales. It showed the greatest decrease of all teams, however, on supportive learning environment, collaboration on problem solving, trust and shared accountability, and collaboration on instruction and on assessment. Team members did not report movement on leadership for professional community and network building or data-based improvement, but this could also be due to the fact that the teams' results on these scales were already so high (4.5 and 5, respectively).

Survey results suggest that team 1 showed overall and consistent progress on most scales measuring inquiry practices and spread. Team 2 tended to start at lower levels on these measures, with a combination of moderate decreases and gains in general, and high gains in particular on professional community and network building (along with team 1). Team 3's results were the most mixed, with high baselines and frequent standstills and declines on measures.

Upon examining triangulated and accompanying qualitative evidence of progress, several sources of variation in teams' work emerged: team composition and turnover; team dynamics; how teams approached distinct aspects of conducting and growing

inquiry and what challenges arose; the role of the DLP facilitators and how they worked

with teams; and how teams went about building networked professional communities

around inquiry. For instance, team 1 was the only one that did not experience turnover,

and showed the overall most stable progress over time. Teams 2 and 3 each absorbed a

member of team 4, with team 3 experiencing more inter-personal conflicts than team 2.

Team 2 struggled on only a few measures of inquiry progress, while team 3 showed

downward or no movement. Team 2 was the most connected of all teams and showed

particular progress on network building. This finding makes sense, as this team was more

connected than teams 1 and 3, having members from 3 different SLCs, compared to only

2 for the other teams. However, team 1, whose composition had remained intact, matched

team 2's sizable progress on measures of spread through network of practice building.

An examination follows of sources of variation in teams' characteristics and

inquiry work, and implications for inquiry depth and spread. Evidence illustrates what

was happening with the three teams and the impact that their work had at the school

level, including on Glades' network of practice around inquiry and aggregate outcomes

on inquiry measures.

<div align="center">*DLP 3 Team Composition*</div>

Table 11 illustrates the timeline of DLP 3 teams and simultaneous growth of

distinct SLC-based inquiry teams at Glades. All three DLP Cohort 3 teams were mixed in

composition, with respect to SLCs, content areas, number of years of experience, and

grades taught. Initially the cohort began work with 15 teachers distributed among four

inquiry teams (three of which had four members and one which had three members). One

team of four, however, broke up when one teacher left very early on and another left

halfway during the 2008 intensive summer planning session. The other three teams

absorbed the remaining two members, which created ripples in team dynamics and work

pace.

Table 11. Glades DLP and SLC Inquiry Teams, Winter 2008 – Spring 2010

T(ime) 1: Winter 2008	T(ime) 2: Spring 2009	T(ime) 3: Spring 2010	After study: Spring 2010 – Spring 2011
~25% of Glades teachers[28] involved in inquiry	~32% of Glades teachers involved in inquiry	~66% of Glades teachers involved in inquiry	~75% of Glades teachers involved in inquiry
9 SLCs	9 SLCs	9 SLCs	9 SLCs
9 SLC inquiry teams (1 per SLC) • 27 teachers total	9 SLC inquiry teams (1 per SLC) • 27 teachers total	27 SLC inquiry teams (3 per SLC, moving to grade-level teams) • 81 teachers total	30 SLC inquiry teams (3-4 per SLC, moved to grade-level teams) • 90 teachers total
15 DLP 1 and 2 participants	15 DLP 1 and 2 participants	27 DLP 1, 2, 3 participants	51 DLP 1, 2, 3, 4, and 5 participants
	Three DLP 3 teams w/12 participants total (started w/4 teams and 15 participants), representing different SLCs DLP 3 Team 1 (4 members): -Science -Music -Global Studies Spec Ed -Global Studies DLP 3 Team 2 (4 members): -Math -Music -Spanish; Dean -Spanish (replaced original 4th member who left to be AP) DLP 3 Team 3 (4 members): -English Spec Ed -Psychologist (moved from team that broke up) -Spanish -English	Three DLP 4 teams w/9 participants DLP 4 Team 5 (3 members) -Social Studies; Dean -Social Studies -Social Studies -Social Studies Spec Ed (dropped out) DLP 4 Team 6 (3 members) -Art History -English/Technology -Science Teacher -Music (dropped out) DLP 4 Team 7 (3 members) -Math -Science -Social Studies Four DLP 5 teams w/15 participants started	

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[28] Proportions of Glades teachers involved in inquiry were computed by adding the number of all teachers participating in inquiry during the given school year – both through DLPs and SLC inquiry teams (and only counting once teachers involved in inquiry through both mechanisms) – and computing the percentage they represented out of a staff of about 170 teachers.

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	DLP 3 Team 4 (broke up, originally had 4 members): -Spanish (moved to Team 2) -Psychologist (moved to Team 3) -Art History (dropped out and came back in DLP 4) -Theater (dropped out)		
	11 teachers signed up for DLP 4 (2 would drop out)		

Team 1 was the only one that did not experience any turnover, and represented

three content areas (Science, Music, and Global Studies) and two SLCs.[29] Team 2

represented three content areas (Math, Music, and Spanish) and SLCs, respectively, and

took in a Spanish teacher. Finally, Team 3 also represented three "content areas"

(English, Spanish, and the school's psychologist) and SLCs, having adopted the

psychologist after Team 4's dissolution. A large body of research suggests that teachers

who are younger or have fewer years of experience are more likely to engage in

technology or data-driven reform. In Glades, however, the principal helped to select

participants, in part based on their leadership track record. As a result, about two thirds of

DLP participants had eight or more years of teaching experience, with some having as

many as 19 or 20.

Inquiry Roles: DLP Facilitators, Principal, School Facilitator, and Data Specialist

Glades' two DLP facilitators co-led weekly seminars on site, in which teams

participated together. Each team was responsible for collaborating on and submitting

group assignments. The principal was an active seminar participant and headed up the

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[29] Music and Physical Education teachers move through SLCs with their students and do not have a set SLC.

leadership component of the DLP. The school's facilitator, Mike,[30] who worked in a supportive capacity with the principal, was not involved with inquiry or DLP. He left Glades during the first year of DLP 3's work (2008) to start his own school. The school facilitator who replaced him was not actively involved with the DLP 3 teams, but supported the SLC inquiry teams in their inquiry work, among other issues. In 2009-2011 he occupied a dual role as school facilitator and DLP facilitator for Cohorts 4 and 5.

One of the DLP 1 graduates had moved into a key supporting role for inquiry, a full-time data specialist administrative position created by the principal. His responsibilities included managing, distributing, and assisting school staff to use student achievement, behavioral, scheduling, intervention, and other data. In addition to working with individuals, he also provided support and training to the nine SLCs and the DLP teams, as needed. DLP teams also took part in inter-visitations, where they shared their inquiry work with and learned from other high schools' DLP teams.

Jeff, one of the DLP facilitators, was a DLP 2 graduate and former Glades teacher. He had transitioned from teaching to an AP role for about a year prior to becoming a facilitator. As an "insider" to Glades and one having occupied multiple positions in the school, Jeff was familiar with and a former colleague to many DLP participants. He also had a very positive relationship with the principal, one characterized by trust and a gradual distributing of leadership. He was in the process of learning how to be a site administrator, as he was a newcomer to that particular position in his career. As a result, at the beginning of the program, Jeff would often defer to the principal and Lily, his DLP co-facilitator. Over time, his collaboration with Lily resulted in the fine-tuning of his own skills as a strategic coach for evidence use and leading systemic change in the

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[30] All names are pseudonyms.

school. He consistently and systematically developed ownership over his new hybrid role, as facilitator, colleague, and supervisor to DLP participants. Simultaneously, he grew more comfortable with his new leadership role as AP as well.

By contrast, Lily, the other Glades DLP facilitator, was an "outsider" to the school, who brought with her a variety of experiences in public education. She had been teacher, principal and AP of a large comprehensive high school, administrator in the superintendent's office, and was trained by the DLP architects. According to program design, her time should have been limited to one day a week at Glades and a second day training with fellow facilitators. However, she chose to spend two full days each week working at the school, in addition to training. Like Laura at Jocelyn, Lily and Jeff had not been involved with inquiry prior to DLP. They received training from Carrie at weekly seminars, along with other schools' DLP facilitators. Participants' qualitative and quantitative assessments praised Lily's expertise, dedication, and the high quality facilitation that she provided.

She was self- possessed and assured, but held a constant learning stance, as our research team observed in the Glades seminars she co-led and at the weekly trainings with DLP architects (which Jeff also attended). Lily had been recruited by the DLP architects as an effective administrator, who brought a wealth of K-12 leadership experience and had led school-wide change efforts in her capacity as a leader at other large high schools. She had not had any previous affiliation with either the university or the intermediary organization that developed the DLP, and was an employee of the intermediary. Lily's outsider status allowed her to sometimes discuss issues with the principal with a certain impunity that Jeff did not have. He was a full-time administrator

at the school and reported directly to the principal, while Lily reported to the DLP architects, her employers. At the same time, her accessibility and assistance to the teachers made her an insider in many of their eyes. They viewed her as someone who spent enough time at their school to know their students and understand the structures and systems in place well enough to dispense guidance about improvement and how to move students into a sphere of success.

Lily navigated the boundary that separates outsider expertise and strategic pushback from insider trust and intimate knowledge. This stood in unique contrast to Mike's immersion in Glades. As extant school facilitator when Jeff and Lily began facilitating DLP 3, Mike had a successful history of working with the principal, in a mentor-mentee capacity. His shift to complete Glades insider and his extreme involvement with school affairs caused tension with his intended role and DLP architects. DLP 2 work, including the decision to move DLP 2 graduates into SLC leadership positions, consisted mostly of the principal's vision and strategy. When Jeff and Lily began to co-facilitate DLP 3, there was a huge shift in responsibility from the principal to them. On the one hand, inquiry practice bubbled up from the inside through Jeff. At the same time, Lily's critical distance from the teams served as an effective and trusted quality control.

The DLP facilitators and principal worked effectively together in pushing teachers' thinking around salient inquiry issues. These topics included how to: go granular with data; design formative assessments; question one's assumptions about students; recruit colleagues; and lead systems change in the school. Jeff and Lily created a process through which they developed and planned each week's lessons, using

materials from the weekly facilitator trainings, and then brought in the principal to discuss planning. About halfway through the program, Lily pointed out that there was a great deal that she and Jeff still had to learn about how to work with one another and the principal: "We have to figure out a way to work together when we don't step on each other's toes….We don't have this down yet." The DLP facilitators spent some of their time negotiating their leadership role in seminars with the principal. His active leadership style was sometimes at odds with giving up the floor to DLP facilitation. For instance, as Lily became more comfortable in her facilitator and insider role, she began to ask the principal to give her back the floor if he interrupted during her facilitation.

DLP facilitators established norms together with the DLP group early on, while still maintaining a questioning and somewhat authoritative stance. Striking this delicate relational balance greatly contributed to the success they had in being heard by the teachers. One teacher noted within the first month of the program: "They run a tight ship…you know, you have to be here on time, you have to have your work on time. You know. And it's not where you're slacking off and everything like that. There's no slacking. But they're there to support you if you have a question or you're confused or anything like that. They're very good like that."

Team Dynamics and Motivation to Join

Interviews and observations suggested that Team 1, the only DLP 3 team that had not experienced any turnover, was the most cohesive and reflexive. According to Team 1 members:

> We love each other…we work well together…It's great. There's no trouble with any of us…We mesh well together. We are different personalities, but we don't clash…we look around the room sometimes…we were looking at the other groups like "What's going on over there?" They were so serious compared to us. I

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mean they were probably seriously working. But we work hard and get our work done, but there is some level of happiness. You don't see strain.

All four team members were veteran teachers who had at least seven years of classroom experience. The science and global studies teachers had taught only at Glades. The team held a generally optimistic outlook about the capacity of school staff and structures to change in order to improve student learning and outcomes. Team members were attracted to DLP for various reasons. These included approval of the changes instituted by earlier DLP cohorts and a desire to lead system-wide change at the school that could impact students outside their own classrooms. A Team 1 member observed:

> The DLP is great. It's making us reflect a lot on our own selves and our personalities and the way we interact with students, as well as how we do things in the classroom. Everything started from our personality, which of course affects students and your outcome in the classroom—right down to the way we teach in the classroom and what we look at. And we do these low inference observations which also make us more aware of our way of teaching, our ways, our styles. And sometimes we take things for granted, certain things, that now we can see much clearer.

In addition to the weekly DLP seminar trainings, Team 1 members met once a week to discuss their assignment plan, divide tasks, and take turns having one individual manage the assignment. They were acutely conscious of not letting one another rely on individual strengths. Members made it a tangible point to have everyone take turns presenting, writing, and managing projects, in order to step outside their respective comfort zones and develop a wide array of skills. They were in regular contact by telephone and email, and their communication was frequent, goal-oriented, and informal. Independently of one another, members made references such as "We love working together," "We always keep in contact," "We're close," and "We love each other." These team members were the most proactive and successful at establishing ties with APs and

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the principal. In this way, they expanded the network of teachers they could reach out to and recruit to do inquiry.

Team 2 was somewhat less cohesive. Teachers articulated certain challenges in working together and working with facilitators that impacted the pace and quality of their inquiry work. Team members felt that they had stumbled a bit on their assignments and products. They perceived that a greater amount and more frequent feedback from the DLP facilitators could have helped with their understanding and with selecting a target group of students more quickly. They did, however, cite the rubrics that accompanied each assignment as invaluable and helpful. Team members also had what they described as completely "opposite schedules," which allowed them no opportunities to discuss or collaborate on their work during the school day: "In the sense of having to do observations and things, we would like to do them together—and we can't."

As Team 2 absorbed a member of the dissolved fourth team[31] there was a short adjustment period, but the addition of a second Spanish teacher appeared to be pretty smooth. According to both Spanish teachers, the Foreign Language department was quite social and they had formed a tie there. Therefore, the transitioning teacher already had an informal and strong connection to this team, despite the team's "initial trepidation," as she describes it.

Finally, Team 3 also absorbed a new member – a Psychologist who had been a member of the dissolved team. Despite this addition, team members initially reported that "so far everything has been working beautifully." A large contributor to this harmonious

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[31] When the second member of team 4 left the program, the principal and DLP facilitators consulted together as to which teams would absorb the remaining participants. They wanted to maximize the SLCs and content areas that each team represented, thereby increasing the potential for inquiry spread to multiple units within the school.

dynamic was the fact that the school Psychologist and one of the special education teachers on the team already shared many students. This previous collaboration facilitated not only the work of using evidence to discuss students' skills and skill gaps and ways to address and assess these, but also the informal task of opening up the team to a new member partway through the program.

Nonetheless, personalities clashed and teachers had to not only iron out conflicts, but also adapt to each other's work and learning styles. According to a Team 3 teacher: "Well, initially [working together] was a little bumpy, you know, because different personalities…like, I'm more laidback and…I'm laidback. And we had to be careful because there were some people that were very *strong* personalities, very strong. So we had to work that out where we just came out and talked about it…So we're developing our interpersonal skills and group." Teachers on this team all cited a motivating interest in systems thinking and broader changes as reasons to join DLP.

All teams pointed to compositional and structural characteristics that they felt facilitated their inquiry work (and whose absence made that work more challenging to carry out): scheduling that allowed them to have a common planning period during the day; working with teachers from other content areas, as this allowed them a perspective inside others' classrooms and served as a channel to reach a greater number of target students; and working with teachers from the same SLC, as this facilitated reaching a "critical mass" of staff within that unit.

Teams' Inquiry Work and Relational Supports

DLP teams tackled the challenging tasks of going "granular" with evidence to identify target groups of students, selecting skills and subskills to address, designing and

evaluating their own interventions and formative assessments, and deprivatizing their own practice. As they did so, the relationships and support they received from DLP facilitators were crucial in exploring and shaping this uncharted territory. The DLP architects who designed the model and provided support through facilitators, had a particular vision for the type of role and positions that the latter would occupy in their work with schools. As one of the architects put it: "Ultimately it ends up being about relationships. And I think where there's a struggle with it, with some of the facilitators, has been around the difference between 'relationship' and 'work'…And I think there's something important about the outsider. And there's a danger of the outsider becoming the insider…And managing all of that is critical." Ideally, a DLP facilitator would constructively push inquiry teams' work forward. He would toe the line between positive rapport and a deliberate and critical distance, which would allow him to be a "critical friend." In this capacity, a facilitator could provide teachers questioning and actionable feedback that they would use to reflect on and improve inquiry practice.

Members of all three DLP 3 teams generally reported receiving high quality facilitation from Jeff and Lily. In addition to being readily available to clear up doubts and answer questions, they modeled inquiry practices, which participants found particularly valuable. For instance, differentiated instruction was one aspect of Lily's facilitation that embodied a classroom practice associated with examining and acting on data to understand where each student is. According to a DLP teacher: "I feel she knows a lot of approaches. And she tries to help us in every way possible, no matter what the problem is, and we try to resolve it. So even though she's an outsider we don't see it as that." According to another DLP participant, "She's able to carry on the conversation in

the room in a way that you can actually, if you're paying attention, see that she's meeting several different levels at once of what people need."

The facilitators helped DLP participants early on in identifying a target group of students. Jeff and Lily leveraged their own knowledge and data resources available through the district and DLP architects. One teacher noted:

> They showed us how we should choose our target students. And we had a lot of data connected to that as well…it was data driven…we used the PSATs…we studied their exams, their written responses…We also created our own assessment from our group, so that way each of our targeted students have the same thing to answer. And that way it will be a uniform assessment that we could judge based on one question that they all had from us.

All three DLP 3 teams decided to focus on writing sub-skills, like paragraph completion and using academic vocabulary. They honed in on Global Studies, which constituted a particularly problematic subject area for target group students. Participants struggled to select a target group of students and to drill down to the particular sub-skill they could leverage for improved student success. According to one DLP team 3 member discussing the target group assignment, a moment of clarity finally came:

> This wealth of information that really challenged our original perspective. And I say "original' because at the end we revised it for a better product. So she just had all this knowledge around 'Do you really think that would work?' And she wasn't in the least bit critical of what we were doing, it was just a matter of asking questions that gave us insight into 'Maybe you could do this differently. Do you really think this would be an effective way? Is there something else that you could have done? Do you think teachers would respond to this as well? Putting yourself in the shoes of the teachers who you're asking to be connectors and mavens and salespeople of your ideas, how receptive would *you* be to that suggestion?'"

Team 2 had a particularly difficult time documenting the progress of their target group of students. They attributed this to a slow start on the assessment front, as they put a lot of effort into getting to know their students and mapping out where they were at and what they might need in terms of an intervention. When the next cycle of inquiry rolled

around, Lily and Jeff leveraged this lesson to work with the team early on to design a clear plan and timelines for each piece of their inquiry process: identification of target group, skill, and sub-skill, intervention design, assessment design, and iterative improvement of intervention and assessment.

Due to the unique triadic relationship among Lily, Jeff, and the principal, the teachers perceived them as a team as well. Teachers noted:

> The three of them together, sometimes you just like watching *them* talk and figure out what they're going to do with us! They're good at both bringing in their own experience and serving as models for us to look at…Jeff and Lily together go off to the [DLP trainings] with the other facilitators throughout the city, and they'll always talk about how that went and bring it back in here. And then the principal comes in…They always seem to talk together on breaks.

The facilitators were able to effectively support DLP participants in selecting target groups and skills. Defining what "effective" assessments should look like, however, was a universal barrier that required additional feedback. Ongoing clarification by Jeff and Lily addressed how to establish that students were actually learning the skill at stake and how to show using evidence that this was the case.

<center>*Deprivatizing Practice*</center>

Part of the credentialing aspect of DLP entailed observing other teachers' classrooms, using an instructional rubric that focused on looking for evidence of students' learning. DLP's initial obscurity and many teachers' mistrust that observations would be used for evaluations initially resulted in a lot of resistance. Although this type of resistance did not disappear entirely, DLP participants used certain strategies to mitigate it. These included: sharing observational data with teachers and discussing it, while keeping focus and language centered on students; letting observed teachers know that they had already practiced classroom observations on each other in their DLP teams

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and so understood what it was like to be on the other side of the rubric; explaining that DLP's purpose was to improve outcomes for the entire school; and finally, relying on the growing visibility of DLP through a greater number of graduates and "word of mouth" about the nature of the program.

According to one DLP participant, "people are starting to become more open…I think in the beginning of the year they weren't very well aware of what was going on. And now it's just become something that they know more of. And I'm sure for DLP 4 it's just going to be much easier…I think that's the hope, the plan…That people could just walk into your classroom and you'll feel comfortable that 'Hey, I'm doing the right thing. I don't have to worry.'" A growing awareness of DLP school-wide and DLP 3 participants' sharing of observational data with colleagues, facilitated a gradual cultural shift around deprivatizing practice.

One of the biggest "shocks" for DLP participants, according to Lily, came about after they observed other teachers' classrooms as part of the credentialing requirements of the program: "there are 'assumptions' about certain people being 'good' teachers and often what was seen in these teachers' classrooms was surprising – not good practice." As DLP participants initially felt quite uncomfortable about observing colleagues, Lily was able to leverage her outsider status to probe their observations. Her questions intended to bring the focus back to an observation rubric and relying on factual evidence to draw conclusions about what they had seen, with a focus on students rather than teachers.

Inquiry Network and Spread

DLP participants utilized several key strategies to recruit and lead colleagues in doing inquiry: opening up their own classrooms to observation by fellow teachers; collaborating on inquiry with colleagues in their SLCs and departments more informally; and sharing data at school-wide professional development sessions. These efforts were increasingly taking place throughout Glades. However, they had been scantily documented, despite a desire by the principal and DLP facilitators to spread inquiry through networks and communities of practice.

Network Structures and Leadership Capacity for Inquiry Spread. One of DLP's goals was to increase not only the sphere of student success, but also the community of teachers engaged in inquiry. This nested connectivity refers to how units in one part of a network (DLP teams) are connected to units in another part (SLCs, departments, or other structures that provide the formal and informal shells to form communities of practice). An affiliation network models this phenomenon, where DLP teams and SLCs are events (network nodes), and the ties (edges) that connect them represent shared memberships (co-occurrence). In other words, if two members of DLP Team 1 are also members of SLC 3, then co-occurrence of events between these two units is two. Figures 12-14 represent Glades' inquiry network at three time points: 1) a baseline of winter of 2008, prior to DLP Cohort 3 beginning work; 2) spring of 2009, about two-thirds of the way through the program; and 3) spring of 2010, shortly after DLP 3 graduation.[32]

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[32] Note that although the scope of this study is limited to teams from the DLP 3 cohort, in the Spring of 2010, DLP 4 cohort team membership was also salient to modeling inquiry network growth. Cohort 4 teams are coded and included in 2010, shortly after their work had begun. Teams 1, 2, 3, and 4 refer to DLP 3 cohort teams. Teams 5, 6, and 7 are DLP 4 cohort teams (see Table 3 for DLP and SLC inquiry team membership).

Figure 12. Glades Network and Shared Memberships Around Inquiry, Winter 2008
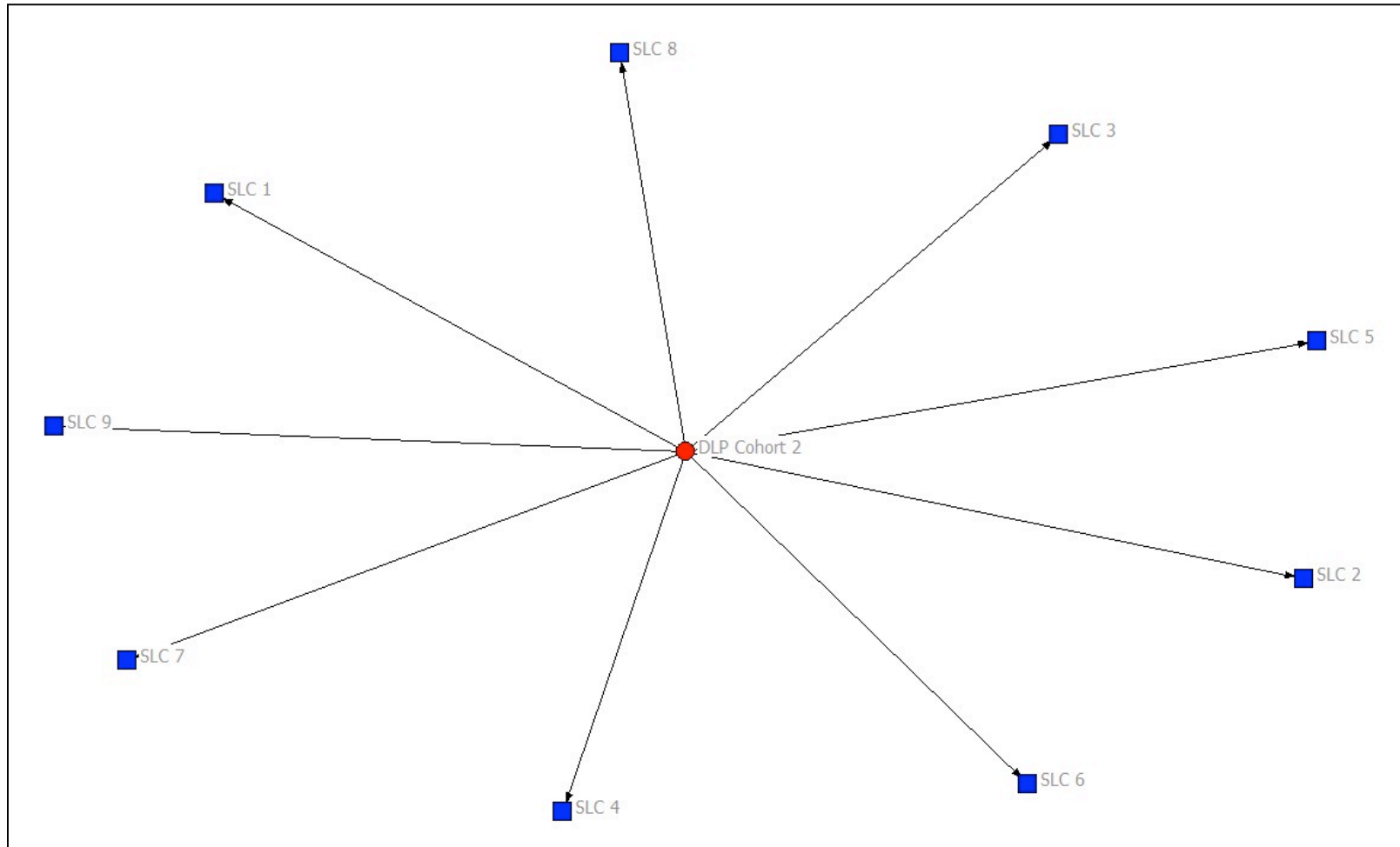
Figure 13. Glades Network and Shared Memberships Around Inquiry, Spring 2009
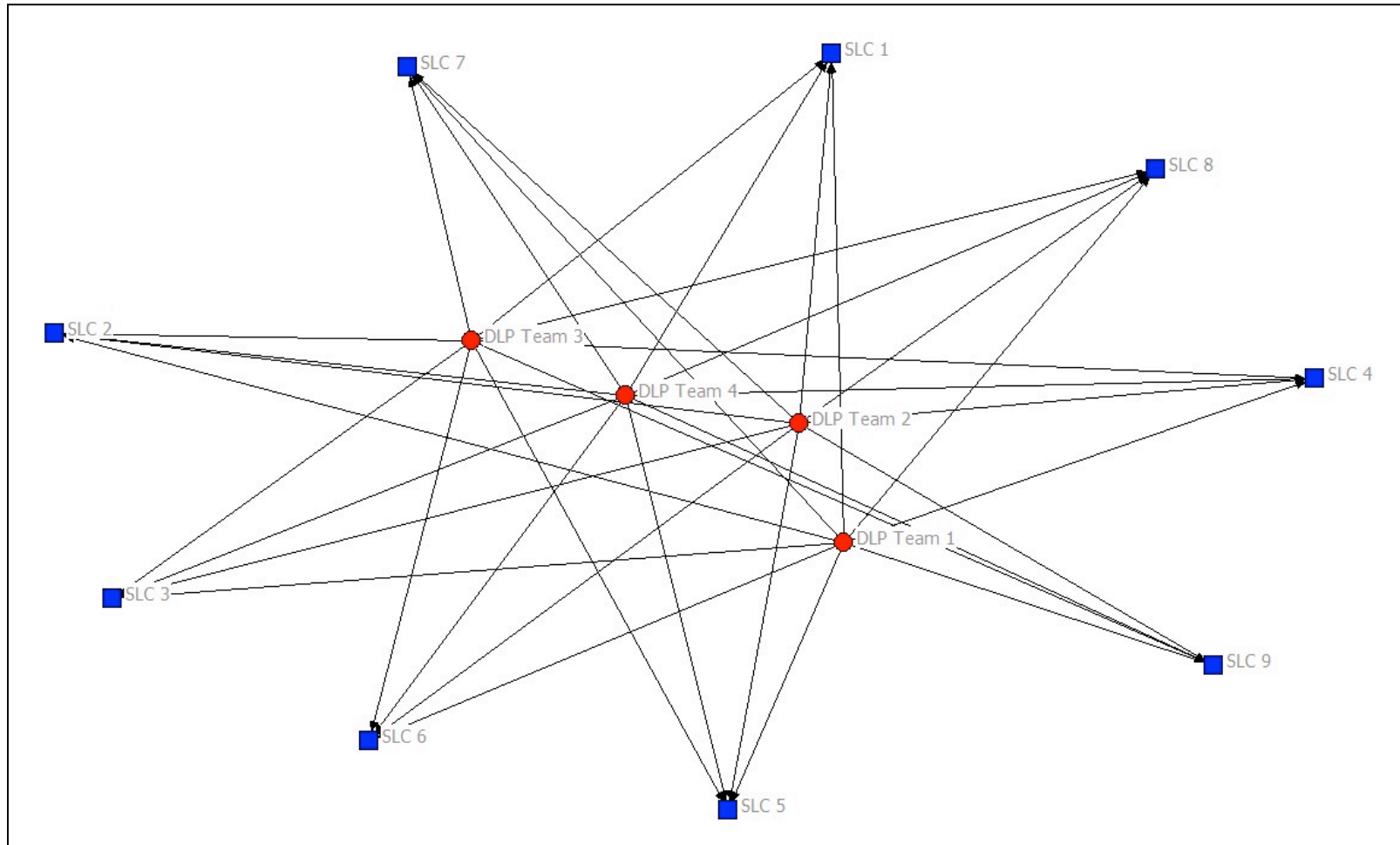
Figure 14. Glades Network and Shared Memberships Around Inquiry, Spring 2010
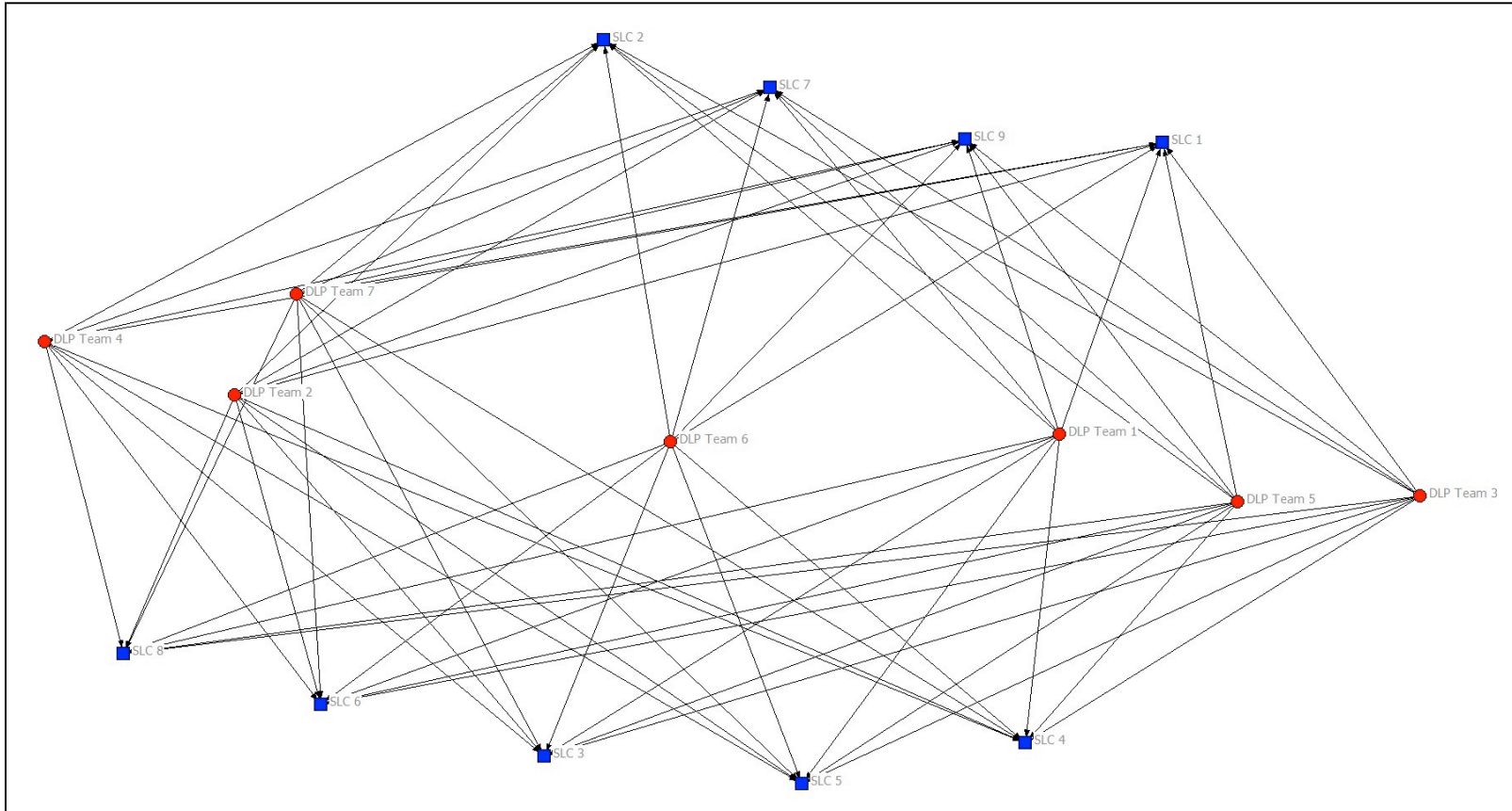
It is clear from the figures that a denser (more connected) network around inquiry developed at Glades over time. A greater number of paths (shared memberships) linked the two types of units that incubated inquiry – SLCs with grade-based inquiry teams and DLPs. Table 12 shows DLP teams' and SLCs' degrees,[33] reciprocal measures that indicate how well-connected each unit was to others that conducted inquiry. All DLPs and SLCs had a greater number of connections to other inquiry units in the school between 2008-09 and 2009-10. This indicates an increase in connectivity, the number of available connections within the network through which inquiry practice and beliefs could spread. DLP 3 teams made fairly significant advances with respect to forging both bonding and outward bridging capital with colleagues around inquiry.

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[33] Digraphs like Figures 12-14 represent affiliations between pairs of nodes. Digraphs are referred to as such, because the relationships they map can be uni- or bi- directional. The indegree of a node is the number of nodes that are adjacent to it, measured by the number of arcs that terminate at that particular node n_i. The outdegree of a node is the number of nodes adjacent from it, measured by the number of arcs originating with node n_i (Wasserman & Faust, 1994). Indegrees and outdegrees are reciprocal in this case, hence degrees are reported.

Table 12. DLP and SLC Connectivity Measures

Network Connectivity Measure	2008	2009	2010
DLP Cohort 2 Degree (1 group, 9 participants who all became SLC directors)	9	n/a	n/a
DLP Cohort 3 Team 1 Degree	0	23	26
DLP Cohort 3 Team 2 Degree	0	26	29
DLP Cohort 3 Team 3 Degree	0	25	28
DLP Cohort 3 Team 4 Degree	0	26	28
DLP Cohort 4 Team 5 Degree	0	0	32
DLP Cohort 4 Team 6 Degree	0	0	32
DLP Cohort 4 Team 7 Degree	0	0	31
SLC 1 DLP Degree	1	32	38
SLC 2 DLP Degree	1	35	42
SLC 3 DLP Degree	1	33	40
SLC 4 DLP Degree	1	31	37
SLC 5 DLP Degree	1	34	40
SLC 6 DLP Degree	1	31	39
SLC 7 DLP Degree	1	31	40
SLC 8 DLP Degree	1	31	37
SLC 9 DLP Degree	1	33	39

Administrators and teachers alike echoed the fact that DLP teams and SLCs supported each other's inquiry work. For instance, according to one DLP participant, "when we had our [DLP] meetings and then we'd have our SLC meetings, we would go back to SLC meetings and discuss what we did. And so in many cases the directors would say, 'Okay,' and then they'll ask us, 'What are you guys doing with…?'" SLC directors (all DLP 2 graduates) who had at least one DLP member in their SLC, designated teachers within the learning community who would be accountable for following through on inquiry, and checked in with them on a regular basis to provide support. Additionally, starting with the third cohort, the principal set student achievement goals that were common to SLCs and DLPs. This strategy legitimized inquiry collaboration and promoted DLP visibility across SLCs.

In discussions with colleagues, DLP participants often relied on the idea of a tipping point, a critical mass, and a network and community of practice developing around inquiry, in which colleagues could participate.[34] According to one participant, "I'm always talking to other teachers to join up. I figure the more people that are involved…the more cohesive an educational community we'll have. And everyone on board means that the system will move a little faster. Less obstructions." Despite initial resistance, "now I think it's getting through to people that there is a difference and the data are meaning something. And I mean I think they become pretty proud when they hear that we are one of the best performing big high schools in the neighborhood and that sort of thing. And then they realize that there *is* a difference." By 2009 and in large part thanks to the ongoing network-building efforts of successive DLP cohorts, teachers were widely sharing classroom-level results on advanced placement and other standardized exams. For instance, they posted data that showed progress in hallways and on faculty bulletin boards, and distributed it at faculty, departmental, and professional development meetings.

Informal Networking Around Inquiry: Subject Departments. DLP-SLC connectivity around inquiry increased steadily over time at Glades. Some evidence suggests that other, less formal relations, contributed to sharing inquiry practices and beliefs, although with less consistency. Department structures were not the primary vehicles for inquiry spread. They lacked the inquiry teams and common planning time to facilitate inquiry work that SLCs offered. There were, however, consistent and triangulated qualitative observations from DLP participants, facilitators, and

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[34] These ideas about spread and culture change came directly from DLP seminar readings, like Senge's well-known work on systems, among others (see: Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization.* New York: Doubleday).

administrators to suggest that informal networking and recruiting via departments met with some success. For instance, DLP 3 participants were successful at convincing many colleagues to incorporate elements of DLP-designed instructional interventions into their teaching. They accomplished this by meeting with teachers during departmental meetings to discuss lesson plans. DLP participants noted: "Teachers are incorporating…answering the aim at the end of every lesson to be sure that the kids understand. And that there's a written prompt at the end…Also the vocabulary prompt is being built into just about every lesson." Some evidence suggests that subject area departments provided DLP participants additional connections to use as leverage points for inquiry spread. However, bridging out to these units was more haphazard and inconsistent, and there are not enough data to conclusively link departments to systematic inquiry work and spread. Towards the end of the study, a collective movement around formalizing the more informal networking connections around inquiry was just beginning. According to DLP and school facilitators:

> …DLP participants were within DLP grouped in teams, working with target students that were specific to their participation in DLP, while at the same time the entire school was undergoing expansion of inquiry work so that every teacher in the school was part of an inquiry team. Which meant every DLP teacher was also part of another inquiry team with, in many cases, different target [students]…[so] I designed, with help from [DLP architects and DLP 3 facilitators], an individual kind of…leadership development assignment, that is charging DLP participants with leading from whatever chair they sit in—whether they're a member, whether they're an informal leader, what have you—leading that other inquiry team that they're on, taking the role to lead those adults.

Distributed Leadership

Glades' principal was an important DLP driver and legitimizing source for inquiry and the teams' work. As someone who sought out DLP, he directed the use of inquiry as a vehicle for whole-school change that began with restructuring. He

understood DLP as a capacity-building model and pipelined all DLP 1 and 2 graduates into leadership positions at Glades, as SLC heads, APs, and the data specialist.

DLP is by definition a demanding and experiential model that tasks educators to take on challenging new roles, as researchers, leaders, analysts, and decision-makers. DLP participants at Glades and other schools frequently expressed an initial feeling of anxiety about the daunting data and decision-making tasks ahead. Teachers, however, were not the only ones who learned by doing and stepped outside their comfort zones while implementing DLP. School leaders in DLP schools, particularly intensive ones, experienced a learning curve that was at times just as steep. Glades' principal had to establish boundaries with DLP facilitators and share the floor with them at seminars, as described in the section on Lily and Jeff's facilitation. He reported moments of increased clarity and understanding around inquiry as often as DLP participants and facilitators did, in particular with respect to distributing leadership to DLP participants:

> But I think it's changed my leadership style to be much more inclusive than being much more in a top-down management. Now when I came here, this was a school in crisis—so I think it did need top-down management at that time to restructure. But then in the early 2000s, like in 2001, 2002, when the tipping point changed and we had gotten in so many new people, we had really stemmed the tide and began moving the school in a positive direction; if *I* hadn't changed I don't know how much would have changed within the school. So I think having gone through DLP 1, specifically DLP 1, made me much more reflective of my own craft and my own process, that I empowered the people that were in there. If you think back… I mean you look at [the data specialist] now—he's young—but think back to 2004, he was even younger.

The principal trusted DLP teams and empowered them to access and network with organizational units at the site. These actions were important supporting factors for teams' visibility as leaders and their capacity for success. Glades' principal had been a strong and "top-down" manager from the inception of his tenure, as the school was

plagued by violence and security problems typical in large schools. Both his and the

teams' reflections indicate that his involvement in DLP shifted his paradigm regarding

entrusting leadership responsibilities to trained teacher leaders. According to a DLP 3

teacher:

> Well, there are more directors and co-directors. There are teachers who are
> coming out of DLP 1 and 2—and even 3—and I find that leadership isn't as top-
> down as it was prior. I find that the directors and the co-directors are really
> empowered to carry out [the principal's] mission and the APs' mission. And so it
> doesn't seem as though he is as overwhelmed. He seems to have this sense of,
> "Okay, I will empower you to make these decisions." And it seems to run very
> effectively…And it shows that people who have graduated from 1 and 2 have the
> capacity…they have been empowered with leadership capacity. And, in a sense,
> that's a part of what motivated me to be a part of 3.

> (According to the principal):
> …In year [X] of my principalship when I got involved in DLP 1, I could have
> very easily gone on autopilot…the problems in the school had really been dealt
> with, we were a mid-performing school, we were not appearing on anybody's
> radar list. It would have been very easy for this school to stay the way it was and
> not change…And if I were not to have been involved in DLP, I think there would
> have been a detriment to my own evolution as a school leader.

DLP work took several years to seep into the fabric of Glades' daily routines. DLP

participants and colleagues discussed how they experienced these gradual shifts, as

inquiry reach expanded through DLP participants' leadership and SLCs. According to a

DLP 3 participant:

> With DLP I think it's letting teachers know that we all need to work together, and
> it's not an AP job, it's not a director job, it's not… We're all putting a part into
> everything to become better…And based on comments that I've heard from
> teachers, I do think that the teachers have a certain respect for the DLP
> participants. They do ask us questions…So there's that kind of change. I'm a
> team-teacher, I collaborate with three other teachers in the building, and they're
> always eager to know, "What are you guys doing? What are you guys working
> on?"…And so we share the ideas. And they incorporate it and they're excited
> about it.

By 2011, approximately 75 percent of Glades' staff members directly participated in at least one inquiry team, via DLP or SLC grade-level teams. One of the DLP 4 participants dropped out of a previous cohort and later felt compelled to rejoin. He noted that part of his motivation to do so was the visible and vocal network of practice around inquiry that previous DLP cohorts built:

> The difference here now is that it's not…inquiry team members telling the staff; the entire staff is part of the inquiry team. And so they *all* are coming up with being able to decide "What is the skill that we need to take care of first? Where can we move them to?" For example, note-taking. Just simple note-taking. It's unbelievable! I mean, you know. And they actually come up with ways. "How will we assess if the student is good at note-taking?" And this was with the ninth-graders in our SLC, just to give you an example. But that is something that I cannot recall happening before, that sense of everyone coming together (the teachers) across subject areas, and making decisions that move the kids forward.

School Inquiry Measures

Connectivity and network density around inquiry increased steadily between 2008 and 2010. DLP and SLC inquiry teams were the primary vehicles for this work and growth. The percentage of Glades staff involved in inquiry via DLP and SLCs also grew, from 25 to 32 percent between 2008 and 2009, 32 to 66 percent in 2009-10, and 66 to 75 percent in 2011 (year following study completion). Rich qualitative evidence corroborates these trends. Although teams were the main inquiry vehicles, their number was not large enough to permit hierarchical linear or other multi-level modeling appropriate to this phenomenon. Regression analysis was also not appropriate for a nested case. Paired t-tests assessed whether differences over time in mean values on scales measuring school-wide inquiry outcomes were significant (Table 13 shows a comparison of differences).

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Table 13. T-Test Results Comparing Inquiry Outcomes Across Time: 2008 to 2010

Outcome Measure	$M1_{2008}$	$M2_{2010}$	Mean Diff	t	P-value
Supportive Learning Environment	3.06 (0.07)	3.29 (0.08)	0.23	2.68	***0.01
Collaboration on problem solving	2.76 (0.08)	2.83 (0.09)	0.07	0.71	0.24
Trust and shared accountability	4.04 (0.07)	4.06 (0.09)	0.03	0.30	0.38
Collaboration on instruction	3.89 (0.09)	3.97 (0.10)	0.08	0.80	0.21
Collaboration on assessment	4.16 (0.09)	4.19 (0.11)	0.04	0.30	0.38
Leadership for professional community and network building	3.91 (0.10)	4.11 (0.09)	0.20	1.72	**0.04
Leadership for data-based improvement	4.19 (0.08)	4.30 (0.07)	0.11	1.32	*0.09
*p ≤ 0.1, **p ≤ 0.05, ***p ≤ 0.01					

T-tests detected significant increases in school-wide averages between 2008 and 2010 on supportive learning environment, leadership for professional community and network building, and leadership for data-based improvement. These findings are in line with an overall increase in network connectivity at the school, with SLCs' increasing degree measures, and with qualitative evidence that Glades as a whole experienced an increase in collaborative inquiry and the use of evidence to drive instructional decisions.

It is important to note that despite an overall increase in network density and inquiry progress at the school level, there was variation in how these trends played out across different SLCs. As Table 12 showed, SLCs had varying degrees of connectedness to DLP teams. There was also spread in SLCs' collaborative inquiry outcomes on survey measures.[35] An emerging hypothesis is that inquiry leadership by DLP participants and

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[35] SLCs were tightly clustered on supportive learning environment measures, in a 2.5-3.5 range between 2008 and 2010. SLC 8 was a positive outlier, whose supportive learning environment growth trumped all others. Except for SLC 2, whose level of supportive learning environment stayed constant, all other SLCs

connectedness were not equally strong across SLCs, and offered key mechanisms to account for differences in SLC outcomes on inquiry measures. Qualitative evidence from DLP participants, school administrators, and DLP and school facilitators pointed to the fact that level and effectiveness of collaboration between DLP participants and SLC leaders was also not consistent. Further research and data collection are needed, however, to explore these three factors further, as potential mechanisms that could account for differences in reported progress on inquiry work across different learning communities.

Looking Ahead and Conclusion

At the end of the 2010 school year, Glades was poised to continue inquiry work and spread it school-wide. Both the proportion of staff involved in inquiry and connectivity between DLPs and SLCs around inquiry were on a steady rise. The school showed significant gains overall on key inquiry measures, with DLP participant and SLC leadership and other factors specific to SLCs potentially accounting for relative differences in inquiry progress across SLCs. Glades had reached a "tipping point" of saturation, with respect to teachers and administrators working on inquiry. A gradual cultural shift was taking place, of examining students' work for evidence of progress, designing formative assessments, collaborating on instruction with colleagues, and sharing data with colleagues across grade levels, SLCs, and inquiry teams.

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showed gains on this metric. Collaboration on problem solving had a slightly greater spread than supportive learning environment, but this was due to an almost one-point dip that SLC 4 took between 2008 and 2010. SLC 3 showed a moderate decrease on this measure, while all other SLCs went up. Gains in trust and shared accountability were present, but overall much smaller for all SLCs than on other measures of collaborative inquiry. This could, however, be due to the fact that SLCs were tightly clustered at a higher level on this measure, between 3.5-4.4 points. Collaboration on instruction hovered at a higher level as well, ~3.5-4.5, but results were mixed, with about half the SLCs showing losses and the others gains. Of all measures, collaboration on assessment had the least spread – ~3.9-4.6. Leadership for professional community and network building only varied somewhat, with two thirds of SLCs reporting gains and one third slight declines. Finally, leadership for data-based improvement increased or remained constant across six of nine SLCs.

With a growing inquiry network and community of practice in place, Glades had

reached a plateau and potential saturation point of success. Administrators and school

facilitators acknowledged DLP's overall success in conducting and spreading inquiry

through the school. At the same time, they had ideas for how to leverage existing

structures in order to strengthen the network of practice that had emerged around inquiry.

According to the administrators and school facilitator:

> One of the strategic things was, the DLP participants…So each one of those [SLC grade-level] teams has a team leader. That team leader is identified by the SLC director. And so we sort of said upfront that we wanted the DLP participants— ideally present and past, but I know my group—to be those grade team leaders. So they, in effect, have a leadership role within a grade team as part of their regular life at the school, in addition to their DLP inquiry work…So the grade level teams, because they're new and because there's so much capacity building, they're further behind. They're still at that sort of really pinning down "What's a high leverage skill?" and "Do we actually teach that in the school? And, if not, how might we teach that?"…Whereas the DLP folks have done that, have tried to actually teach to stuff, and realized some of the challenges there. So where we're going this semester is really focusing on the DLP participants as leaders of those teams, and that sort of leadership opportunity.

With a network and structures around inquiry firmly in place, school leaders focused their

efforts on the content of inquiry relationships in order to strengthen the depth and pace of

work. An additional group to which administrative attention turned was the assistant

principals. After initial conflicts among teachers and APs regarding lack of clarity in

evaluations and professional development, according to the principal, "the idea this year

was that same structure of an AP matched with a small learning community, but rather

than have the AP dictate what that agenda is, the needs would be sort of surfaced through

the inquiry work." In this way inquiry teams identified target groups of students and sub-

skills they needed to improve, and the AP and SLC director together would provide

guidance and help. The principal noted that: "either they'd have that knowledge or they

could get that knowledge, or they could connect them to resources such that…So they would be more reacting to the student identified needs." In describing this ongoing attempted innovation in inquiry, administrators went on to say: "So we're just getting to the point where, based on that, now teams are moving at different speeds. So you've got a team that knows what they're gonna do, they're ready to go, they want to intervene. You've got another team that's like 'I'm not sure what skill to pick.'…now [we're] at a point where they *do* it and they're learning things, the APs are now adjusting and reacting to where they are."

When reflecting upon the totality of Glades' experience with multiple cohorts of DLP participants, administrators honed in on the collaborative aspect of inquiry and its resulting cultural shift for the whole school:

> The other thing is that the DLP 3 teams [are] attacking the culture of isolation at schools…And so we're trying to create professional learning communities. And we know how much that flies in the face of centuries of…decades of work. It's separate from accountability…And that cultural shift is gigantic. And that's not going to happen in a day; that's going to happen over the course of years. And so I think keeping our eye on that ball, in terms of the cultural shift that this is, it's teams of teachers as problem-solvers on the ground rather than top-down having all the answers. Like, this empowerment. This building capacity at the teacher level. That, to me, is…the big thing that I keep repeating over and over and over—some with my DLP, but even more with the Glades community as a whole. That's where we're going. That's where we want to go.

> Well, and perhaps more importantly even, is teachers not only as problem-solvers but as learners…It's shifting the whole culture of schools in that "I'm in my 15th year of practice and I'm a learner" and "I'm a principal and I'm a learner" and "We are learning together." I think it's even harder…I think we can come together as teams in schools to solve problems, but I think it's really hard to push that culture to come together as 'teams who learn.

Glades' DLP trajectory resulted in a dense and growing network of practice around inquiry, built upon a strategically-timed restructuring and the work of successive and larger cohorts of DLP participants. Focus shifts next to Inverness High School, whose

principal took on a distinct approach to grow inquiry and teacher leadership around

inquiry in the school. Glades is an example of a site that utilized DLP to deprivatize

practice and grow a community of practitioners focused on inquiry. Inverness captures a

range on the inquiry spectrum where the primary focus for bringing about school-wide

change was on infusing problem solving and shared accountability into daily routines.

CHAPTER 6: INVERNESS CASE STUDY

Inverness School History and Data and Leadership Program Background

A strategic principal and facilitator alliance characterized a push for DLP as a

lever for school-wide change at Inverness. This partnership sought to routinize collective

problem solving and shared ownership over student success into staff's practice and "the

way we do things here." Inverness High School has had the second-longest history with

the Data and Leadership Program (DLP) of all schools in the study (after Glades),

starting in 2005, though initially not involved with the credentialing aspect of the

program. It was founded in the 1920s and, as a result of a growing school-age population

in surrounding communities, relocated to a larger building in 1982, which it still occupies

today. By 2012, Inverness' principal Anne[36] had led the school for thirteen years. In the

late nineties, upon her arrival, Inverness' track record was riddled with challenges

pertaining to school improvement and a lack of evidence-based practice.

Coincident with launching DLP in 2005, Inverness restructured into Small

Learning Communities (SLCs). Each of the eight SLCs has no more than 350 students

and its own AP, teacher coordinator(s), guidance counselor, school aide who works in a

supportive capacity with the counselor and interfaces with parents, and unique theme and

courses. Seven of Inverness' SLCs are profession-based with a focus on specific careers.

In addition, one SLC provides specialized supports to struggling students, and one works

to increase the number of students completing advanced courses. Two to three SLCs

share each of the school's four wings, and both administrators and teachers generally

perceive SLCs as incubating units for inquiry teams' work to improve instruction.

About 2500 students attend Inverness (Table 14 shows student and staff

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[36] All names are pseudonyms.

demographics). The student body is diverse, and seven percent of students are Asian, 13

percent black, 26 percent Hispanic, and 54 percent white. Shifts in neighborhood

composition and economic mobility in the past decade have produced dynamic change in

the school's population, with a threefold increase in English Language Learners to six

percent. Sixteen percent of Inverness students are special education students and 51

percent qualify for free or reduced lunch. Average attendance is a little over 80 percent.

About 90 percent of graduates go on to attend two- or four-year postsecondary

institutions, and the school offers both Advanced Placement and college extension

courses.

Table 14. 2011 Inverness[37] Student and Staff Demographics

Student Population	*Percents and Counts*
Enrollment	2500 students
Asian	7%
Black	13%
Hispanic	26%
White	54%
Eligible for free or reduced lunch	51%
English Language Learners	6%
Special Education	16%
Average daily attendance	80%
Staff	
Fully licensed and permanently assigned to the school	100%
Two or more years teaching at Inverness	83%
Five or more years teaching anywhere	62%
Have Masters Degree or higher	80%
Core classes taught by "highly qualified" teachers (NCLB)	93%

All teachers are fully credentialed. Staff turnover is low, in particular for teachers

with five or more years of experience, at five percent. Eighty three percent of school staff

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[37] Data from 2011 district and state school reports, not cited for confidentiality reasons.

has two or more years of teaching experience at Inverness and 62 percent more than five years of teaching experience overall. A majority of the teachers, at 80 percent, have at least a Master's degree and 93 percent of core subject classes are taught by highly qualified teachers.

The district uses two evaluation systems to assess schools' performance annually. The first system focuses on student achievement and moving the bottom third of students academically, and rates schools on an A-F spectrum. Inverness earned a B on this system for the duration of the study. Performance on the second, which grades staff's use of evidence to drive school-wide improvement, on a scale of development and proficiency, also held high and steady, at either "highly-developed" or "excellent" for all years.

External Partnership with DLP Architects and Internal Restructuring

The principal and school leaders had a specific and strategic vision for school-wide change that included the following components:

- Restructure into SLCs

- Move Assistant Principals (APs) into SLC heads' roles

- Train entire teaching staff on inquiry using the regular version of DLP and starting with APs/SLC heads

- Gradually distribute leadership to APs/SLC heads throughout this process

- Leverage the high quality facilitation provided by one of the DLP architects' embedded role in the school

The goal of this multi-pronged approach was to grow DLP across successive cohorts of teacher leaders as a school-wide lever of change without certification. Inverness' principal arrived at the decision to restructure in part through discussions with teachers,

who selected and supported the shift to Small Learning Communities as a mechanism to improve school and student outcomes, while simultaneously preserving components of the school's existing culture. At the same time, Inverness' principal became involved with DLP through her collaboration with a small group of fellow principals of large comprehensive schools who wanted to improve their student outcomes and learning environments. According to her, during an early conversation with funders of a larger school improvement framework that included DLP, she and her colleagues declared:

> If we give you a number of [big] schools that have the capacity to change, strong leadership, and the need to improve statistics, would you agree to pilot this program [DLP] and support it?…So as far as the structures, the common time, the instructional supports that we needed, that all came from our success with that program. And then we really took an honest look at the structure that we had in place that wasn't working, and why it wasn't working, and we kind of talked about why we needed other things.

Inverness had a long-standing partnership with DLP architects, and had collaborated with them on various school improvement initiatives prior to and during the DLP. According to the principal, Inverness and the DLP architects "are a really good mesh because they force us to keep looking at the little stuff, while I'm still able to manipulate and play with the big stuff and the structure." Inverness was also a recipient of several federal and private grants to support the creation and implementation of Small Learning Communities. The school restructured from a comprehensive model to SLCs early on in DLP participation. Inverness' leaders planned the school's restructuring in 2005-06, embedded DLP into this plan from the start by training the first cohort of participants in preparation for their transition to APs/SLC heads, and moved to SLCs in 2006-07. DLP architects supported both the transition to restructuring and DLP as a

school-wide reform strategy from the beginning. SLCs absorbed departments and former department heads (AP equivalents) were re-assigned to head up the communities.

Extant Inverness Inquiry and Introduction of Successive Cohorts of DLP/Inquiry Teams

At Inverness, one individual (Carrie) was the school's DLP facilitator. Although she was one of the DLP architects and never a district employee, she worked with Anne and Inverness staff in some of the supportive capacity that a school facilitator would have, had one been assigned to Inverness. From 2008 to 2010 Carrie also worked with Janine, who would subsequently assume some of her responsibilities as DLP facilitator. Carrie currently still works with Inverness staff on the writing initiative that grew out of inquiry. Carrie had previously been a high school teacher for many years and taught at (and is still affiliated with) the university that partnered with the intermediary that co-designed DLP. She was a person deeply steeped in both inquiry efforts and the district and state educational contexts that precipitated the push for data-based decision-making. Carrie was well-versed in inquiry as a result of being one of the DLP architects. She had also trained under and collaborated with a K-12 inquiry veteran at the district, who worked with her to design DLP. She was widely respected as an expert on going small for big change and the training she provided to other DLP facilitators to get the program off the ground. She spent several days a week on site at Inverness, and increased the number of days she was there in accordance with the site's inquiry needs.

Cohort 1 members, the first large group of DLP participants, took on roles as inquiry leaders in the SLCs. This first cohort went through full DLP, which included peer coaching and training seminars with Carrie, without receiving credentials. Participants then became facilitators for Cohort 2, with Carrie's support. Anne made this strategic

decision early on, in order to avoid the potential turnover and "brain drain" that could

easily result, once her teachers received DLP training and became eligible for

administrative positions anywhere in the district. She also wanted to include APs who

already had credentials in the shift to inquiry and SLCs.

Carrie trained the first DLP cohort of Inverness teachers in inquiry during the year

that Inverness restructured to SLCs, and each of these teachers was assigned to lead a

community. In DLP 2, Carrie oversaw DLP Cohort 1's training of Cohort 2, via peer

coaching. She spent much more time at the school than most other facilitators (school or

DLP) did at theirs, and collaborated closely with Anne. The two shared a vision for

DLP's implementation and spread at the school, and as a result, how DLP played out was

highly co-engineered by both.

Because of the strategy to structure DLP differently than the program's typical

design as a credentialing program, in Inverness' case, DLP cohort and inquiry cohort are

used somewhat interchangeably. There was also no DLP team structure separate from

SLC inquiry teams. Analysis examines the collaborative inquiry work of DLP Cohort 3.

Table 15 illustrates the history of the DLP cohorts at Inverness over five years. Inverness

had three officially designated cohorts. Carrie trained the first cohort, which then in turn

trained the second. The third official cohort was more loosely organized as such, since

inquiry teams were already so prevalent and common at the school, and received some

support from both Carrie and Cohort 2 participants. After this last formally defined

cohort, successive waves of inquiry work entailed inquiry leaders from Cohorts 1 through

3 working with their SLC colleagues in teams. Inverness' first DLP cohort was already

comprised of eight teams under the principal's vision for inquiry linked to SLC

restructuring. Since Inverness initially tackled inquiry on a greater scale than Glades or Jocelyn, the cohort (comprised of teams) is the unit of analysis that makes the most empirical sense. Inverness restructured into eight SLCs at the same time as DLP Cohort 1 began its inquiry work. Every staff member who was already an AP or a future SLC head underwent DLP 1 training, and was subsequently assigned to lead an SLC. Cohort 1 participants' preparation as school and inquiry leaders accompanied the shift to small learning communities.

Table 15. Inverness DLP/Inquiry Cohorts, 2006 – 2011

DLP Cohort	Dates	Teams and Participants	Post-Program Participant Outcomes	DLP[38] Facilitator	School Facilitator	Data Specialist/ Team	%[39] Teachers Involved in Inquiry
1	Jan-June 2006[40]	8 inquiry teams; 30 teachers and 8 APs	All AP/new SLC heads underwent DLP training; Cohort 1 would mentor Cohort 2	DLP architect	None officially but DLP architect who was school facilitator did some of this work	None	25%
2	Sept 2006-07	22 inquiry teams; 48 teachers	Inquiry/DLP work grows in SLCs; Cohort 2 would mentor Cohort 3	Cohort 1 and DLP architect	Same	None	40%
3	Sept 2007-08	38 inquiry teams; 72 teachers	Cohort 3 is last officially-trained cohort; Inquiry/DLP work grows in SLCs	Some support from DLP architect and Cohort 2	Same	Former DLP participant	60%
No formal cohort defined	Sept 2008-09[41]	50 inquiry teams; all 120 teachers	Inquiry/DLP work grows in SLCs	No formal training in place	Same	Cross-SLC data team led by data specialist	100%
No formal cohort defined	Sept 2009-2010	60 inquiry teams; all 120 teachers[42]	Inquiry/DLP work continues in SLCs	No formal training in place	New to position; conducted graduate work on inquiry at Inverness	Same	100%
No	Sept	60 inquiry	Inquiry/DLP	No formal	Same	Same	100%

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[38] Principal was actively involved with Cohorts 1-3 and less so with subsequent waves of inquiry, when APs and teachers took more widespread ownership of inquiry work.

[39] Proportions of Inverness teachers involved in inquiry were computed by adding the number of teachers participating in inquiry during the given school year – both through DLPs and SLC inquiry teams (and only counting once teachers involved in inquiry via both) – and computing percentage of staff they represented.

[40] Inverness restructured to SLCs this year.

[41] Principal mandated inquiry in all SLCs this year. SLCs moved to grade-based inquiry teams.

[42] Two teachers completing intensive DLP with Jocelyn teams.

formal cohort defined	2010-2011	teams; all 120 teachers	work continues in SLCs	training in place			

Four changes took place in 2008-09. First, the principal mandated inquiry for all

SLCs. Second, SLCs formally moved to grade-based inquiry teams, in addition to other

informal ones based on teachers' common interests and shared groups of struggling

students across content areas. Third, a central data team emerged, with members

representing all SLCs and led by a data specialist who was a former DLP participant. The

team's responsibility was to conduct cross-SLC inquiry and examine student data school-

wide. Finally, the DLP facilitator's responsibilities shifted to a secondary support role, as

successive cohorts no longer received formalized training by one facilitator or previous

cohorts. Instead, these waves of teachers collaborated on inquiry with colleagues in their

SLCs on an ongoing basis, as inquiry had sufficiently spread into the fabric and

permeated the routines of "how we do things" (according to teachers) at Inverness.

Cohort Motivation to Join

Because Anne treated DLP inquiry as a school-wide improvement strategy from

the start, and did not attach credentialing to the program, she structured alternative

incentives to initially attract participants. For Cohorts 1 and 2, she gave the entire staff a

choice to participate, with these participants slated to receive about seventy hours of

overtime pay during their first year in the program. Anne allocated a portion of her own

Title I funds for these purposes and the rest came from DLP's external funders and

central office stipends. These seventy hours included some of the teachers' seminar time

and additional time for participants to collaborate on their seminar projects and

assignments. According to the principal:

> I think it's the best Title 1 spent money—because it's real PD. It's research, it's instructional practices…There's so many pieces of it that really make it solid PD, and ongoing. And what's better than that! So I think with DLP in general that the collaboration is strong, it forces people to really take a look at their own practices. I think that now [my Cohort 2 teachers], in *my* eyes, are my model teachers. I could bring anyone to their classrooms and I'll never second guess what's going on—because now they're very conscious of their practices. Cohort 1 will tell you that they have changed all of their instructional practices.

The majority of Cohort 1 participants voiced interest in the program, through conversations with Anne and other administrators at the school, as a result of which the principal was the primary decision-maker as to who would participate. Cohort 2, on the other hand, was a more diverse group, that self-selected into the program, and in turn (as Anne noted): "all stepped up to hold leadership roles in their SLCs…They're go-to people. Especially Cohort 1. But now I'm finding Cohort 2 people find themselves as go-to people for the SLCs, which is kind of nice."

In 2007, when she reflected back on her initial decision to not include the administrative credentialing component in Inverness' DLP, Anne felt that she had made the right choice: "I don't think we would have been as successful [had we chosen the credentialing version]…And I think that my APs would have assumed that they already were there and they had nothing to work on in terms of leadership. And that was big for me. Because although we're not doing it for credit, we're not separating the need for the leadership skills and working on those pieces." Since Inverness staff did not have credentialing, Anne shared rhetorically:

> So what's our incentive? It's basically all about the kids I think. It's like that for everybody here. I think it's because we want the kids to have a successful future. I mean I know that to be true of almost all of us. And I think our second incentive is to prove to this narrow-minded [area] that it is a special and a great place for people to be. And for ourselves it's just to make adequate yearly progress and to do what we have to do in a very transient very low-level population.

When Cohort 1 and 2 participants reflected on their motivations to join DLP, they pointed to reasons that were all rooted in their site's specific circumstances and students. According to one teacher, "my first impression is looking at specific areas, what students need help in, trying to increase their achievement in certain areas. Almost like a business growth model: squeezing out three percent every year, kind of, as you go, and making the school better, kind of, bit by bit." Another participant pointed to the interplay between DLP and restructuring: "it's better that we have these smaller communities. I get to know kids by face. If I don't know all of them by name, at least I know them by face. And you develop a stronger relationship with the students…[and through DLP]…we can concentrate on a smaller amount of students."

Cohort 1 and 2 participants represented various SLCs. Many of them, however, echoed the ways in which DLP and SLC structures reinforced each other, as vehicles to use evidence to focus on the achievement and progress of a small group of students consistently over time. One participant asserted:

> I find that it's about time that we start to zero in specifically on specific items and tasks…And not just a school-wide mandate, but just to find specific kids who need specific help, and work with the teacher in observing. And I'm finding this to be helpful—because for many years I've seen what *hasn't* worked. And, you know, mandates and mandates and changes and changes. And this…I'm feeling like I'm part of something now that could possibly lead to specific changes, and changes in students' lives directly…I think that the purpose is to have school-wide growth in the statistics. But I see it as "to help students individually." That's how I will always look at it.

Even special education teachers who expressed feeling at times marginalized due to the small size and special resources required by their student population, recognized inquiry as a strategy that could take their students' needs into account and incorporate these into

evidence-based practices that other content area teachers were adopting. Several Cohort 2

participants voiced this motivation to join DLP:

> First, when I was involved in this, my initial reason…I'm a special ed guidance
> counselor…so I work with students from all the different houses…My reasoning
> for being involved with this is because I found that population to be a population
> that really needed a voice, and people to help them and who get caught up into all
> the statistics and the programming and getting the right classes for these kids. And
> it just seems like special ed was always an afterthought. And I really felt that I
> wanted to be part of this because I felt that somebody needs to represent this
> group in these meetings and make sure that we're included in the planning, and
> that we understand that they come from…they have different goals…I'm just
> looking at the statistics and narrowing in…So seeing all these little things *will*
> help me to work with the students better.

Inquiry Roles and Relational Supports: DLP Facilitator, Principal, and School
Facilitator

A lynchpin of Inverness' success in building a network around inquiry and

weaving inquiry over time into the fabric of SLCs' work, was the highly effective and

strategic collaboration between the school's principal and DLP facilitator. The principal

was a well- established and respected leader, both instructionally and operationally. She

was steadfast and clear in her vision for using inquiry and SLCs as simultaneous vehicles

for school improvement. Anne had a reputation both among her colleagues and in the

district at large as a determined and strong personality, as well as a principal who was

very effective at using evidence to illustrate success and point to areas that needed

improvement. At the same time, her articulated goal was to gradually and strategically

train and distribute leadership to her SLC heads (former APs), so that they could lead

inquiry and their SLCs to improve student success. In 2007, as Cohort 2 was wrapping up

its work and Cohort 3 was about to begin, she voiced this view of her role as a principal

in the DLP process: "I think eventually…I don't know about right now, because I don't

know if I can relinquish all that because we're still too early in the stages…but certainly

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later on to be more of a facilitator and a go-to person for everybody else to come to, but

almost that each [SLC] will begin basically running itself."

When prompted further, she declared that although "I'm not really a

delegator…there will be less that I will have to do, because it will happen…I've seen it in

[another DLP school]. It'll just happen. So you won't be putting out these day-to-day

fires. They go away. They really do go away."

While the majority of principals in the district did not articulate preferences for

DLP and school facilitators to the DLP architects, in Inverness' case Anne had very

specific guidelines:

> So they came one day and they met with us here, and they basically sat us down
> and said, "Okay, what are you thinking about? What are your plans? Talk to us
> about your proposal. Talk to us about what has worked and what hasn't worked
> here. Talk about your needs. What would you expect?" And we talked to them.
> And basically they turned around and said, "Okay, why do you need us here? I
> think that you can do that without us." And I said, "But I don't think so." And
> they were like, "Why?" And I said, "Well because: understand that the day to day
> happenings will drag us away from our goal. We really need an outsider who's
> going to be here and keep us on task, because the day to day happenings can
> really push you off the edge…"I need somebody who's going to call me on
> things, someone who's going to battle me and challenge me"…And they kind of
> looked at each other at the same time and said, "Okay. We know who to pick. It's
> got to be [Carrie]."

Anne was not only highly cognizant but also very honest about how challenging the

inquiry work would be. She explicitly specified her strategy to have an outside facilitator

to push the work and ask difficult questions that sometimes staff already embedded at a

school site feels uncomfortable or unsafe to ask. Finally, and most critically to what

proved to be a very successful partnership, Anne wanted a facilitator who was not only

experienced, but would challenge and push her to move inquiry forward, not just her

staff. Few principals would press so adamantly to have an outsider come into their

schools and challenge them openly, especially with respect to a risky innovation. In Anne and Carrie's case, this strategy proved to be highly effective. Carrie worked as Inverness' DLP facilitator for Cohorts 1-3, and continued as a consultant on the professional development initiative in writing that inquiry generated. She also provided some guidance and collaboration to the school facilitator Janine, who started that role in 2010, after doing graduate work at Inverness for several years.

Carrie and another DLP architect had worked closely together to design both the program's scope and curriculum. Carrie was a former teacher and administrator, with experience teaching and mentoring at both the K-12 and postsecondary level. She trained all DLP facilitators over several cohorts of the program. The DLP facilitators and Inverness' administrators and teachers widely praised her inquiry expertise, dedication, and facilitation abilities. She became an insider at Inverness fairly quickly, all while maintaining a critical friend stance and distance that allowed her to push the inquiry agenda forward with school staff, without creating conflict. According to the DLP 2 participants:

> [Carrie] keeps us on track. I think that's been her main role…She gives us guidance. She gives us a lot of guidance…[She's] always emailing us. "Call me anytime with any questions. If you don't understand this, let [me] know." She sits down and wants us to understand it…And also knowing that we've had things revised numerous times. "Okay, we realize this is not working." And being able to admit that it doesn't work and we've got to change something.

Carrie managed to get successive cohorts of DLP participants at Inverness comfortable with an open and iterative feedback process linked to revisions and concrete actions. Both research and practice suggest that this process is not the norm in many schools. Cohort 2 participants also noted that:

She keeps us on kind of a research perspective about things—just kind of I think from the background—in terms of presenting persuasive arguments…And the acceptance of constructive criticism…And feedback. And being able to accept that people may make comments about something, but it's to help you to improve the task and listen to other people's ideas, to be open to that…She's also helping us refine what our comments and critiques are. Like, what to look for. "What are you looking for?"…We had presentations two weeks ago and we were all going, "It was good."…And so [she said]: "What do you mean "it was good"? *Why* was it good?" You know, she's helping us to learn how to critique better.

As the DLP program grew in reach and number of schools, Carrie had to balance her time between the embedded critical friend role she occupied as Inverness' DLP/school facilitator, and her weekly trainings and ongoing support she provided to all intensive DLP schools' facilitators. 2009 in particular was a difficult year from Anne's perspective, because "every other school got 3-3 ½ days of facilitation and we lost Carrie…this year specifically, now that Carrie is down to only one day, and she wants to be here not just to support us but because obviously her and [her fellow DLP architect] need to know [what's happening in the school]."

The logistics of Carrie's role at Inverness resulted in Anne vocalizing certain frustrations to district-level leaders about needing a separation between the types of responsibilities inherent in being a DLP facilitator and a school one. Every other school in the district had a school facilitator, who worked on a wide variety of issues, including curriculum, assessment, and leadership development at the site. Carrie's main responsibilities entailed launching and supporting DLP cohorts school-wide at Inverness, which in and of itself was a very demanding job. She had the additional train-the-trainer role for all other DLP facilitators. Through DLP work, she targeted many of the issues that other school facilitators did at their sites, like data-based instructional decision-making, but these were additional responsibilities that she took on informally through her

role at the school. According to Anne, not having an individual dedicated to Inverness solely in the capacity of a school facilitator meant that:

> [I had] no connection to any of the other administrative things you're doing…I didn't have the walkthrough protocols…All of the more administrative stuff, I wasn't getting…I just felt like everyone else had an extra body! So even if it was just to throw around ideas or have conversations or just to be the middle person between the conversations that were being held at the central office. I felt like I was always a link away from everything.

Although Anne had the choice to change service providers during this time, she decided against it, and maintained a focus on DLP as a lever for school-wide change:

> Because I don't think all [the school facilitators] really do inquiry…DLP and [school] facilitators are different…But that school facilitator can certainly help with your initial conversations about your data…In your role as a leader, that other person can be the facilitator…Carrie and I had a nice mesh where I might go off on a tangent about things that weren't so factual, where she could bring me back to the factual things. You know. 'Cuz you're emotionally involved in your school, and they're not…And you need to start small. You need to have just a group of kids, a small group of kids, and I would say no more than 20 kids in that first group, where you just really monitor. If it's monitor 'credit accumulation', then let it be that.

The tension that Anne described between keeping inquiry focused on going small with a target group of students and sub-skills, and growing this work school-wide, was at the heart of many of the challenges that Carrie, Anne, and the DLP cohorts worked through with inquiry, especially at the beginning. According to Cohort 2 and 3 members:

> One thing that we had to keep telling our House was, "*Trust us* in this process." Because the same frustration *they* felt, all the coordinators felt. Because it is a process of trying to find the right answer. And we *would* get frustrated with Carrie—before we broke into small learning communities and were going through this process. Because we'd do all this research and inquiry work and data analysis, and then we'd come up with something, and Carrie would say, "You've got to get smaller." And we said, "Could you just tell us the answer? Can you tell us what to do?" And she said, "I can't. And every House is going to have different problems. And you need to learn how to work through this." So, once we understood that… That *was* part of the resistance now. Like, it's a moving target! "But you have to trust us. In the end, you're going to get results from it"…You just have to go through the process to finally see, "Okay, there's something here."

In 2008 inquiry work was really taking off school-wide through the SLCs. Carrie grew concerned about preserving the depth of going granular and staying focused on a small group of students as a lever for bigger change:

> I'm worried that people won't hold to getting small. On the other hand, in my slower moving thing, when I get used to it I'm like, "First of all, okay, let's see. Because if you *can* make a system-wide change faster, great." And, second of all, I have to admit that when I did the work at Inverness I would be saying "Stay small" and Anne would be saying "Move it."

In 2009 onwards, Inverness staff continued the inquiry work that had already taken hold at the school through SLCs, SLC leaders, and the continuity of support provided by Carrie and Anne's stable long-term partnership. At this point in time, Carrie passed some of her inquiry and other responsibilities on to Inverness' newly minted school facilitator. Janine had observed Inverness' restructuring and gradual embracing of inquiry from the start, as she had conducted her graduate research on one of the SLCs' inquiry work, so was quite familiar with both the school and DLP.

Janine was at Inverness twice a week, where she met with and updated Anne on SLCs' work and attended their common planning time to participate in inquiry. By 2010-11 inquiry processes were a core part of Inverness' daily work. Anne observed: "everything we do kind of meshes together. So if [the teachers] take a little piece of the differentiation and they use it to incorporate strategies within the curriculum that they're developing so that it's always there, I think they'll be able to do that. I have Carrie and Janine…they are willing to help support the direction. And Carrie is hell bent that this doesn't get stagnant."

Successive Cohorts' Inquiry Work

Cohorts 1 and 2: Going Granular and Deprivatizing Practice. Between 2006 and 2011, Inverness grew its DLP from eight inquiry teams and 30 teachers to 60 inquiry teams and counting. All staff was participating in at least one team (content-area, grade-level, or SLC- based), all SLCs had common planning time devoted to inquiry at least twice a week, and all SLC heads had undergone DLP training early on in the program's tenure at the school. Each inquiry team within each SLC had three to five members, met at least weekly, and focused on distinct target groups of students and learning targets.

Cohort 1 had the sharpest learning curve and worked intensely with Inverness' DLP facilitator. She trained all teams through weekly seminars whose content and structure were replicas of the credentialing DLP version in other schools. These teams spent a year identifying student target groups from the lowest third of achievement. They iteratively designed and assessed instructional interventions to move students on identified sub-skills in academic vocabulary building, writing, and math.

This first cohort put in place not just the inquiry processes that it would spread to subsequent cohorts through mentoring, but also the inquiry foci that formed the basis for SLCs' goals, planning, and work moving forward. According to members of Cohort 2, among others:

> One of the big goals that [Cohort 1 participants] had was…writing and the vocabulary initiative, which I'm pretty sure all the SLC…did a pretty good job of implementing that. It's harder in some subjects than others…And for some kids than others. But they definitely found that is the area they were going to focus on, and one thing that they pushed.

The three focal areas of academic vocabulary, writing, and math skills formed the foundation to identify target groups of students and learning targets. They also served as

the basis to implement a school-wide professional development initiative around writing, in 2006-2011 and beyond. From the start, a pervasive challenge for not just Inverness' but other schools' teams, was how to spread participation in and ownership over inquiry. A Cohort 1 member recalled:

> I do remember a *lot* of resistance in the beginning…It was almost like a secret society: "What are they *doing* down there behind closed doors?"…And so I remember those days…Because I always felt like people were looking at me in the hallway…"No, we're not a secret society!"…But when the administration says, "We're going to do this, but we want to do it with your strengths and create a program"…What do you think we should do with this program?"

When DLP first came into play at Inverness, some of the staff that was not involved with the program was not aware of what DLP participants were working on and harbored suspicions. As Anne increased communication around what inquiry was and how DLP members spent their time at meetings, some concerns diminished. The primary factor, however, in mitigating this resistance, was DLP participants publicizing and sharing their findings and data with colleagues. The spring of 2006 marked the first of many subsequent results-sharing sessions that DLP teams conducted with the rest of the staff. This first year of intensive, strategic, and publicized inquiry created the foundation to continue growing inquiry as a school-wide school improvement strategy. As Cohort 1 members recalled in 2010 when looking back to their first year of inquiry:

> Things have changed so much since then. And I think part of it was, once we showed our inquiry work and they saw "Yeah, this really works". And then they had a second cohort, and a third cohort. And then everyone became part of the process. And I think just the spread among the Houses, and people partaking in the inquiry work themselves, has really made a difference. Because teachers can *see*: yeah, we *are* moving students. And that's what being a teacher is about. *That's* what made the difference, I feel. I don't think it was the procession…The fact is that this wasn't rammed down our throats. They gave us a lot of open-ended options to work on these things.

In 2006-07, Cohort 1 passed the inquiry torch to Cohort 2, through mentoring and coaching, and with a consistent focus on academic vocabulary, writing, and math skills. As participants from both cohorts remember the experience of working together, there was a "bond" as a result of having gone through a shared ordeal. As part of the continued publicizing and transparency around inquiry work, Cohort 1 openly shared the obstacles it had encountered in implementing inquiry and strategies that participants had used to address these. Cohort 2 teachers observed:

> I find Cohort 1 is the most helpful in giving us direction where we're supposed to go. Because we get to learn from…their pitfalls. They come in almost on a regular basis on Tuesdays…And they…present something. What they did at that stage. Yeah, to speak of student work. They'll say, "In preparation for stage two this is what we did."…The end result of our spring term is to present to them. They were very helpful. And they know what they've been through and what we're going through…They keep us pointed in the right direction.

As the sphere of student success grew at Inverness, so did the network of teachers and school leaders engaged in inquiry. In the spring of 2007, a network of 22 inquiry teams and 48 teachers that represented about forty percent of Inverness' faculty was working across all SLCs (see Figure 15).[43]

During this year, inquiry took a stronger hold at the school, with a greater number of teachers involved. Resistance from some colleagues deepened during this time, as DLP participants moved to conducting low inference observations of target students who were not always confined to solely DLP teachers' classrooms. Teachers noted:

> The biggest resistance I had was going in to people who were not on board to observe their classrooms…One of the things we had to do was this low inference observation. And people were very… you know, observations in this school are

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[43] As previously stated in Chapter 5, an affiliation network models nested connectivity, which refers to how units in one part of a network (DLP teams/cohorts) are connected to units in another part (SLCs, departments, or other structures that provide the formal and informal shells to form communities of practice). DLP cohorts and SLCs are events (network nodes), and the ties (edges) that connect them represent shared memberships (co-occurrence).

very uniform and…And they're very serious. It can mean your job. "So who are *you* to walk into my room and say you're doing this nonjudgmental observation?"…I thought it was like spying. That's how I felt.

Figure 15. Inverness Network/Shared Memberships Around Inquiry, Spring 2007
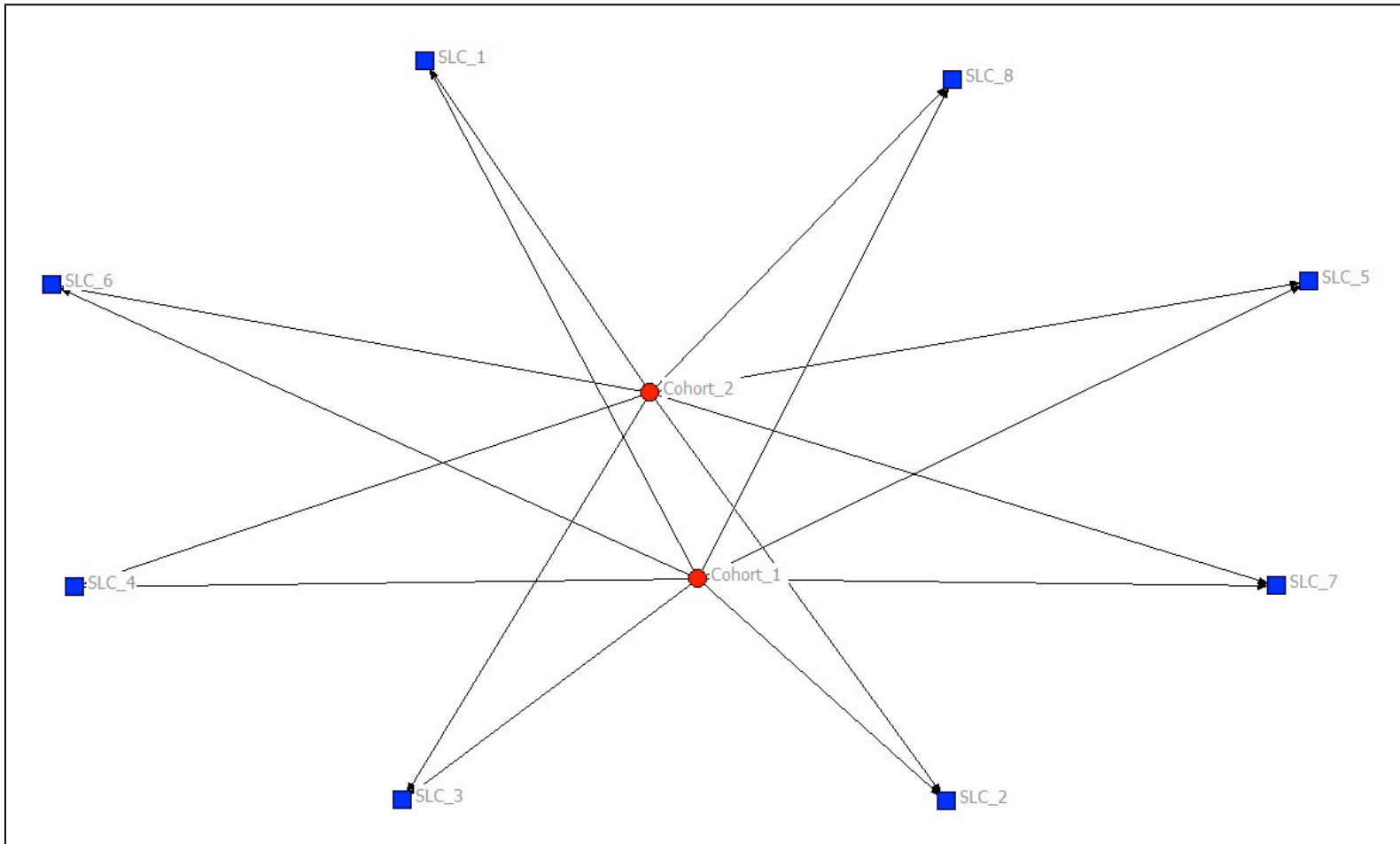
As Cohort 2 participants spent more time practicing low inference observations on each other, they developed and vetted a set of strategies for approaching colleagues to do the same. Strategies included: framing and keeping the focus of the observations on student learning rather than teachers' practice for evaluative purposes; reviewing the low inference observations with those observed; and sharing out student data that pertained to specific learning targets with teachers. Although this process was challenging, Cohort 2 participants ultimately reported "now we understand what low inference observations are, we understand what they mean, the purpose of them. And the teachers are more comfortable because we were trained more."

In addition to the interactions around student observations and school-wide professional development sessions around inquiry, DLP participants continued to leverage common planning time and SLCs as structures to increasingly build trust, knowledge, and a network around inquiry. A focus group of Cohort 2 teachers exchanged the following insights:

> In your house you do grade levels, right? Ninth grade target group, tenth grade target group. That's what we did last year, and that's what we're going to stick to. Because, again, it's involving all teachers. No longer is it just your kids, my kids and his kids without anyone else. Now it's every grade…Every single teacher individually is going to have to find a target group…So they'll be part of *a* target group…then we're gonna put it all together and we're gonna find out what was the problem, why are they the target kids, and what kind of intervention we can implement in the classroom so that kids eventually move forward.

DLP participants moved to observing and interacting with target students, in addition to sharing the same set of students with SLC colleagues. As this happened, DLP teachers drilled down to sharing data with students and discussing progress and metrics with them directly. A Cohort 2 participant noted a change in the way information sharing took place through inquiry:

From two years ago…it's a big big difference. Especially what we even did today in the common time meeting, we actually *met* with kids…We actually met together and we looked at their…we picked a grade level, we looked at their report cards and their transcripts and their exams. So kind of what we're doing here, we did on a small scale. And then we actually pulled them. We actually sat with two kids today and said, "Okay, this is what's going on. What can we do to change it?" And I think to me that was the greatest thing we could have ever done.

By the end of the 2006-07 school year, Inverness improved its freshmen students' credit accumulation by almost fifteen percent and made single- and double-digit increases in students' standardized test scores for all grades across a majority of content areas (Talbert et al., 2010). After two consecutive years of inquiry implementation, the DLP model was poised to take deeper root into the culture of the school. Cohort 2 participants decided to continue growing inquiry participation through mentoring Cohort 3 and continuing staff-wide inquiry PD into 2007-08.

Cohort 3, Steady Work: Network Structures and Leadership Capacity for Spread.
In 2007-08, teams continued struggling with and becoming successful at going small with data and targets. Teachers were beginning to engage in informal "team-of-one" inquiry. They monitored students' progress with instructional interventions in their own classrooms, in addition to the inquiry they did with their teams. During this time, as a third cohort of DLP participants joined the pack, Inverness' connectedness between DLP cohorts and SLCs continued to increase (see Figure 16). At this particular juncture in the school's inquiry trajectory, however, the qualitative depth of the relationships, trust, and expertise that this network of inquiry practitioners was developing was just as important for spread as the network's steadily growing density.

Figure 16. Inverness Network/Shared Memberships Around Inquiry, Spring 2008
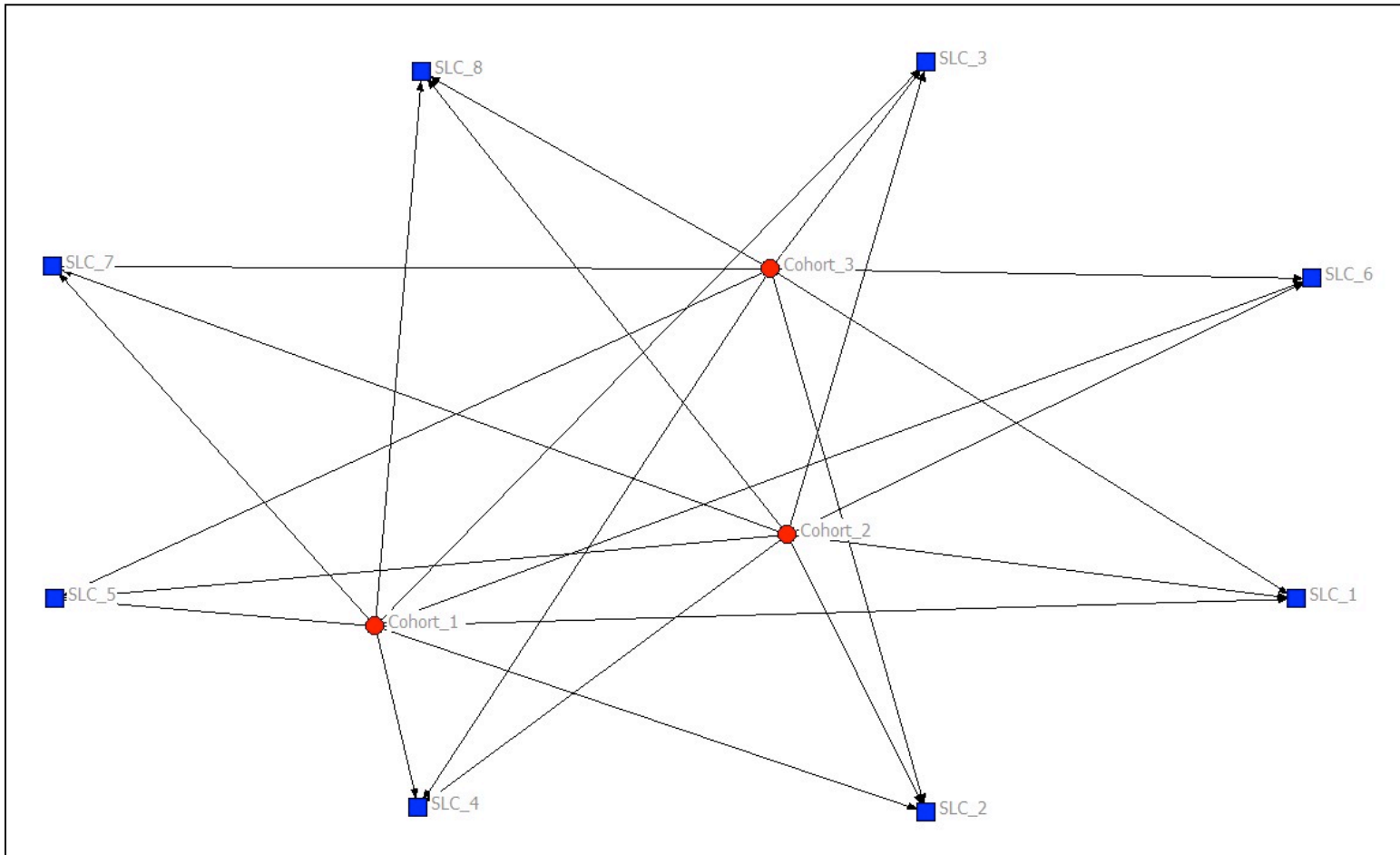
To begin with, the practices that Cohorts 1 and 2 had put in place around framing colleague observations as focused on student learning persisted and expanded. Cohort 3 jumped right into "observing each other because we were comfortable that way," without the hesitation and side-stepping that had characterized previous cohorts' work around this touchy subject. For DLP participants, who at 60 percent now outnumbered non-participants at Inverness, the norm of practice had shifted to observation and to giving and receiving feedback about how target group students were faring across classrooms. These cohort participants included school leaders in the articulation and framing of this process:

> And then it became like, someone would go, "I really need to see this child, this student, in your class"…And, in a sense, that's who I was looking at the whole time. I would look at one of my target students in that class—in science class or in math class—and I would study his behavior or her behavior in class. But I was also observing the teacher as well. But I had to approach it...because me, like a science person, I never did it before in my life! But I knew I needed to see that person that day.

Once the team had developed their own framing around following the student and not "looking at the teacher," members approached their school leaders, including Anne:

> There was some discussion at some point with the teachers: "How do I tell another teacher that I'm coming in? I have no authority." So as a group of teachers we went to the administrators—because they *can*. And we agreed that if we presented in a way that "we're not looking at *you*, we're not trying to catch *you* doing something wrong, but we need to see how So-and-So is operating within your classroom" it's completely different.

As Cohort 3 participants' frequency of observing each other and colleagues increased, so did their reflection about their own practice. One DLP 3 teacher described this bi-directional reflection process and changes in one's own instructional practices as follows:

> Already an observable change is because we're so more involved with each other and the students. Because *everyone* is looking at data—and not just an assistant principal, but there are *teachers* looking at data, *every* teacher looking at data.

Your awareness of what you're doing in the classroom just increases just from that fact, just by association and observing other teachers and starting to see, "Well, what are some of the habits that I have that they have?" And as a result you naturally make changes that improve your instruction…you can see subtle difference in your own teaching because of the level of awareness and how deeply entrenched you are in the process.

In the third year of DLP at Inverness there was still a consistent focus on writing, as well as academic vocabulary and math. This provided continuity in inquiry processes and practices transmitted across cohorts, among DLP and non-DLP teachers, and through SLC leadership. This consistency in inquiry focal targets provided the backbone to refine and continuously improve student success. One important outcome of maintaining stable learning targets over time was the opportunity to infuse these in cross-disciplinary conversations for which SLCs provided the structure and common planning time. DLP 3 participants described how DLP brought about the spread of this shift in thinking from teaching to learning:

> When we shift our thinking from 'how we teach' to 'how the students learn'—it's not just the teacher teaching the whole, but when you look at the individual students who are in front of you and how *they* learn, it's really created this entire shift in the way as a school community we're approaching what we're doing here…I can say very honestly that this is something that the entire school community is looking at. Guidance counselors who are part of our Cohort 1 group, non-instructional assistant principals, AP organization, AP guidance, we *all* are part of the process in really looking at the way our kids are learning.

Inquiry became more commonplace at Inverness and came that much closer to becoming a part of the school's culture and approach to improving student achievement. DLP became a tool to build collaboration not strictly around evidence use, but also around interdisciplinary thinking about students' skills outside of individual teachers' content areas. According to a DLP 3 history teacher:

> I stepped outside my content area a little bit—because usually I just taught history as history. And now I'm focusing more on writing more than I've ever done as a

teacher before. How to write an essay, grammar, punctuation…these are things—I mean, to be honest—as a history teacher I never really put the main focus on. But now I am! And that's all because of the research and looking at the [exams] and seeing what they're lacking and going into classes and doing low-inference observations…it definitely changed the way I teach.

An increasing proportion of Inverness teachers, both DLP and non-DLP ones, were using and owning inquiry practices in their own classrooms. According to Cohort 3 members, "what's happening *here* is that *we're* a part of the process, so we're discovering for ourselves what's working and what's not. So we believe *ourselves*—more than if someone told me what I should and should not be doing. I'm discovering for myself what's right and what's wrong. Therefore I become more vested in making the changes." As a result, various SLCs' inquiry teams articulated a need for cross-SLC collaboration on not only sharing data, but also interventions that had and had not been successful. The purpose of this dissemination was to identify effective supports and decision-making practices to inform systems thinking and systemic change.

Shift from Network Building to Coordinating Effort and Information. A critical mass of Inverness teachers was utilizing inquiry as a strategy to improve student achievement. Concern shifted from establishing a network around inquiry to assuring that this network coordinated efforts and information flow, to build systems of interventions and strategies to improve student success. In 2007-08 a former DLP participant had informally taken on a data specialist role in supporting different SLCs' inquiry teams with their work. The growing inquiry network and infrastructure at Inverness, resulted in SLC inquiry teams and school administrators identifying the need to connect different inquiry teams' efforts across SLCs at the school. DLP Cohort 1 members, the APs of

whom were SLC directors at the time, explained the need to connect target group and

instructional intervention work as follows:

> We're dedicating two days a week every week in our house meetings. Each teacher is going to get a copy of the transcript of every one of their students. And then from that we extract the target students of the house. But within each teacher they may also have target students that aren't *house* target students but their own target students…[so] we're actually creating a…centralized data team with one member from each SLC. We'll meet together on a monthly basis to basically streamline the data that's needed into the SLCs for whatever target work.

The goal of the centralized data team was to streamline the expansion of the sphere of

successful students, by providing a focal organizing point for the rapidly growing inquiry

network at Inverness. The strategy for rolling out this centralized data team in 2008-09

was to leverage the data specialist's and principal's inquiry expertise by having them lead

the team's discussions and guide its work. According to the data specialist and other DLP

1 participants:

> The goal is to…streamline the data that's being used, and to not only affect the movement of target populations within each SLC to benefit the SLC but to also benefit the school as a whole. The students in the SLC are moving, but at the same time it's coinciding with kids that need to make adequate yearly progress and so forth, so the school moves as well…

> Having a central data team is going to help really facilitate the lines of communication so that all of the SLCs really are going to have information as to what's going on in the other SLCs, so then we don't really necessarily have to recreate the wheel over and over again. You know, we can draw upon the research that another SLC has done to help speed things along in our own SLC.

> As the 2008-09 school year began, Inverness was poised to leverage the various

inquiry incubating units already in place – SLC teams, cross-SLC data team, and DLP

cohort teams – in order to expand its inquiry network reach school-wide into every

classroom. After three years of struggling with resistance from colleagues, going small

with target groups and learning targets, deprivatizing practice, and building relationships

and teams around inquiry, even non-DLP teachers expressed a sense of collaborative

urgency around scaling inquiry spread:

> When DLP first started I wasn't…part of Cohort 1. I don't think anyone here was part of Cohort 1. So we were asked to do…you know, while they made the extra stipend money, *we* were doing the data collection, *we* were doing the stuff. And, I'll be honest with you, I didn't want any part of it. I'm like, "Why do I have to do this? It's unfair. *I* don't get extra money for this. I've got to stay after school." And then, eventually, as you become a part of it, I think you can actually see the benefit. Because when you're actually part of something like that you see the benefits from a different angle than when you're on the outside of it. And I think the slow incorporation of not only DLP 1, DLP 2, and…being part of DLP 3, the idea here was to slowly infuse it into every house, into every teacher, so we all feel a little personable, so we all feel a little responsible for the changes. Especially when we see results! I mean that's the overall goal here. We want something that works! And…this seems to be working!

A DLP 1 participant articulated the following step for 2008-09:

> We're at a point now where we've done the research, we've developed…in some cases some very strong intervention programs for targeted skills. But we're at a point now where we're trying to figure out how as a school we can systematically put these strategies in place across the board…Right now it's sort of (for lack of a better phrase) word of mouth. You hear that so-and-so is doing this great intervention and this might be something that could help them in their particular classroom in taking advantage of it. So how is the school to kind of institutionalize these things that we found out across the board for *all* of our kids to benefit from?

Post Cohort 3, Here to Stay: School-Wide Network around Inquiry. In 2008-09

Anne mandated inquiry for the whole school (see Figure 17).[44] Headed into this school

year, about 60 percent of Inverness' staff was already participating in inquiry teams and

the DLP process was bubbling up as a successful one from the ground up. The mandate,

therefore, did not meet with major resistance. The SLCs and extant fabric of teachers who

already participated and believed in inquiry teams as vehicles of change, facilitated

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[44] Since all teachers were required to and participated in inquiry, technically all staff not part of DLP 1-3 took part in inquiry 2008-09 onwards. Figure 17 illustrates the grade-level teams that arose and grew this work in SLCs.

smoothing over residual resistance. The cross-SLC data team provided an additional connecting point for the inquiry network at the school.

To begin with, Anne, Carrie, and the SLC heads pulled together the learning targets that ongoing DLP work had identified into several school-wide efforts, to move from a reactive to a preventative model of addressing students' data-based achievement gaps. Inquiry teams engaged in at least two days of common planning time and support from Carrie each week, which was more than double meeting and planning time formally allotted to inquiry until this point. Staff used this time to analyze available achievement data to identify students who scored below certain thresholds in math and English Language Arts for being on track to graduate. Teachers implemented the following interventions for these students: differentiated instruction, heterogeneous grouping, individualized student attention and mentoring, before- and after-school tutoring, and eliciting regular feedback about comprehension of different concepts in class.

Figure 17. Inverness Network/Shared Memberships Around Inquiry, Spring 2009
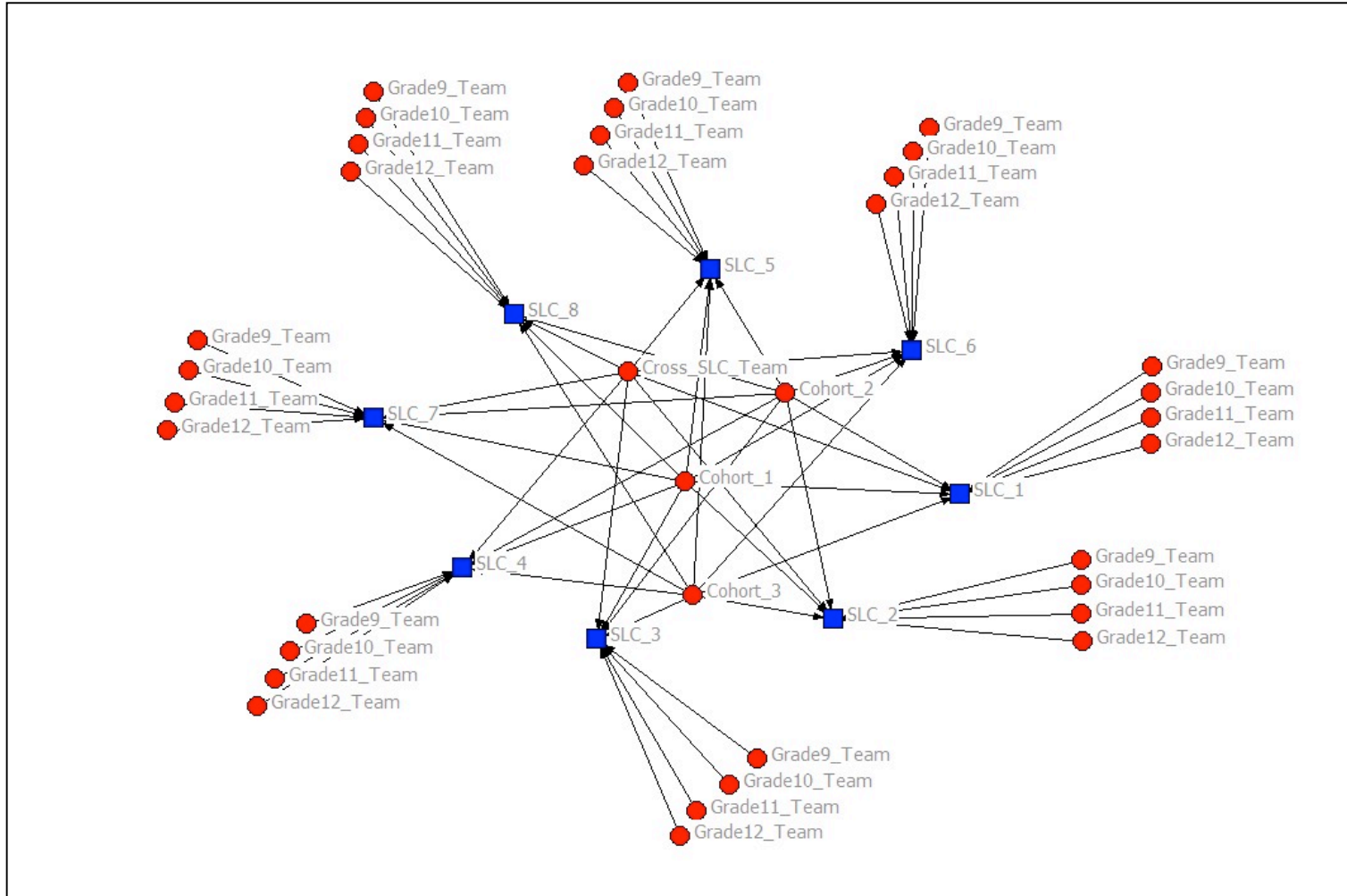
In 2009-10 and 2010-2011 the network around inquiry increased in density and connectivity. Additional inquiry teams formed within SLCs and the cross-SLC inquiry team solidified intra-SLC exchange and use of interventions and assessments (see Figures 18 and 19). In 2009-10, the principal and various teachers echoed one other when they described how inquiry had become an accepted and standard process at Inverness. The principal observed:

> Most SLCs…do inquiry three days a week, and talk one day a week, and SLC business one day a week…But part of inquiry is the PD that's kind of all meshed in at this point…And in addition to…Every SLC has to have at least one team still devoted to the writing inquiry…We suggested at least three inquiry groups for each SLC, according to their size; one of them mandated to still remain on writing…And this went out to the entire staff so that we can get feedback on where to go for next steps.

Teachers themselves corroborated the network and relationships built around inquiry as a school-wide improvement strategy:

> It's just amazing how this is sewn into the fabric of our school now. Just learning that skill alone is a big process. And we're just so used to doing it now. But the thing that we even do without thinking twice is, when you assess the kids it's "What do they know? What do they not know? What do they almost know?" And that's where you start with a skill. "What do they almost know?" They have an idea of it, but they haven't mastered it yet. After they master that, then the 'thing that they didn't know' becomes the next thing that they master.

Various teachers between 2006 and 2010 echoed the common goal of leveraging inquiry to improve students' writing. Starting with the 2009-10 school year, the inquiry teams lobbied to bring in an outside expert on developing secondary students' writing skills, which program met with great success. One SLC's teachers described how they incorporated the professional development that the whole staff had requested into their extant inquiry processes of conducting a baseline assessment of student's skills, selecting a learning target, and iterating interventions and their evaluations:

The process starts with a pre-assessment. Then teachers get together and look at the pre-assessment. And we've had tons of this [writing] training…So we kind of evaluate it using a lot of what we've learned there, and a lot of the rubrics and whatnot from rubrics that have been created from her teachings…So you evaluate it, and you target your skills. Once you've figured out your target skill, you figure out what your intervention is going to be. So you start with some interventions. Then you do interim assessments. More interventions. So you have this process of at least one or two or maybe multiple interventions. But in between each intervention you're doing an interim assessment saying, "Did it work? Where else do we need to go next?" That's where you're doing your tweaking.

Figure 18. Inverness Network/Shared Memberships Around Inquiry, Spring 2010
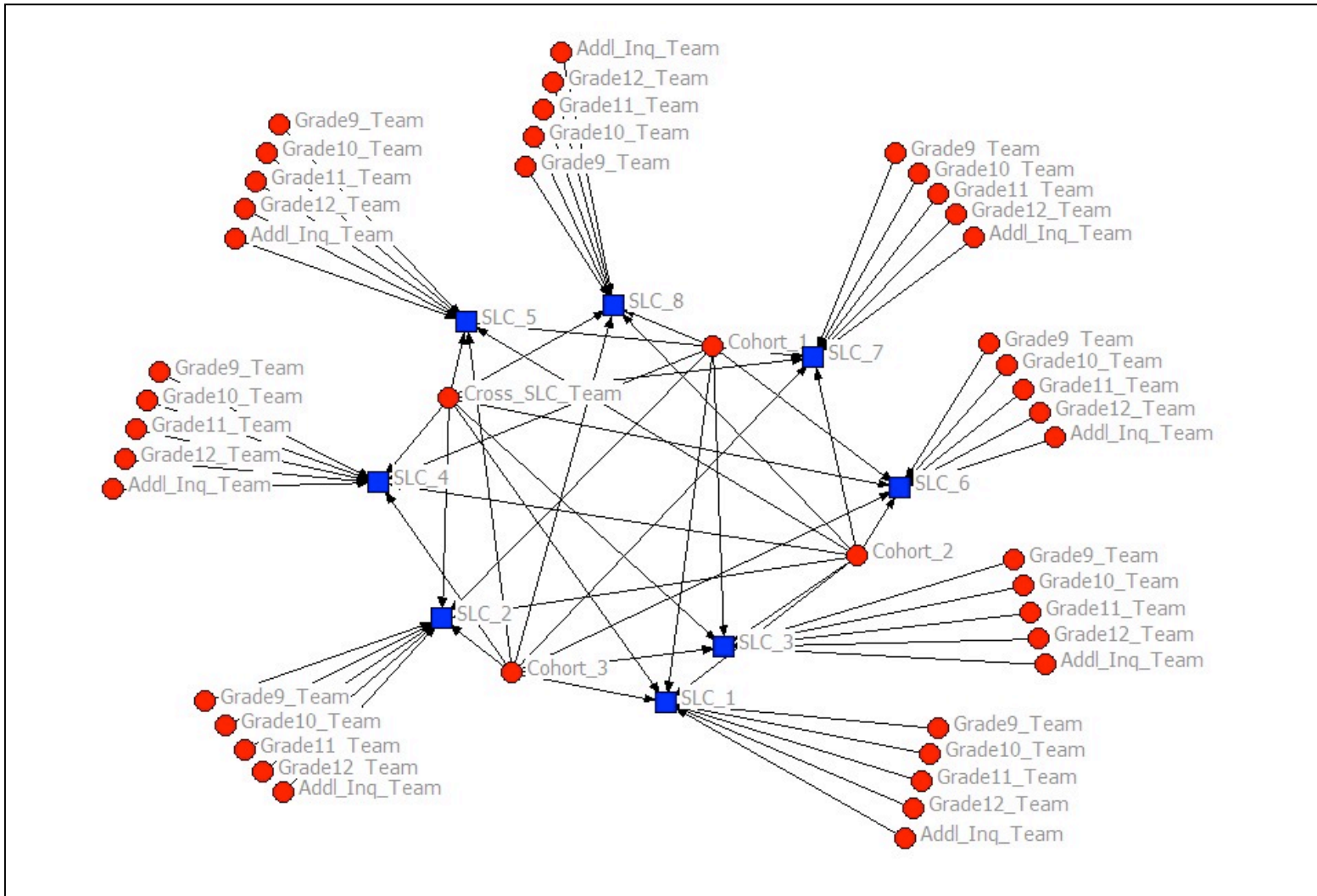
Figure 19. Inverness Network/Shared Memberships Around Inquiry, Spring 2011
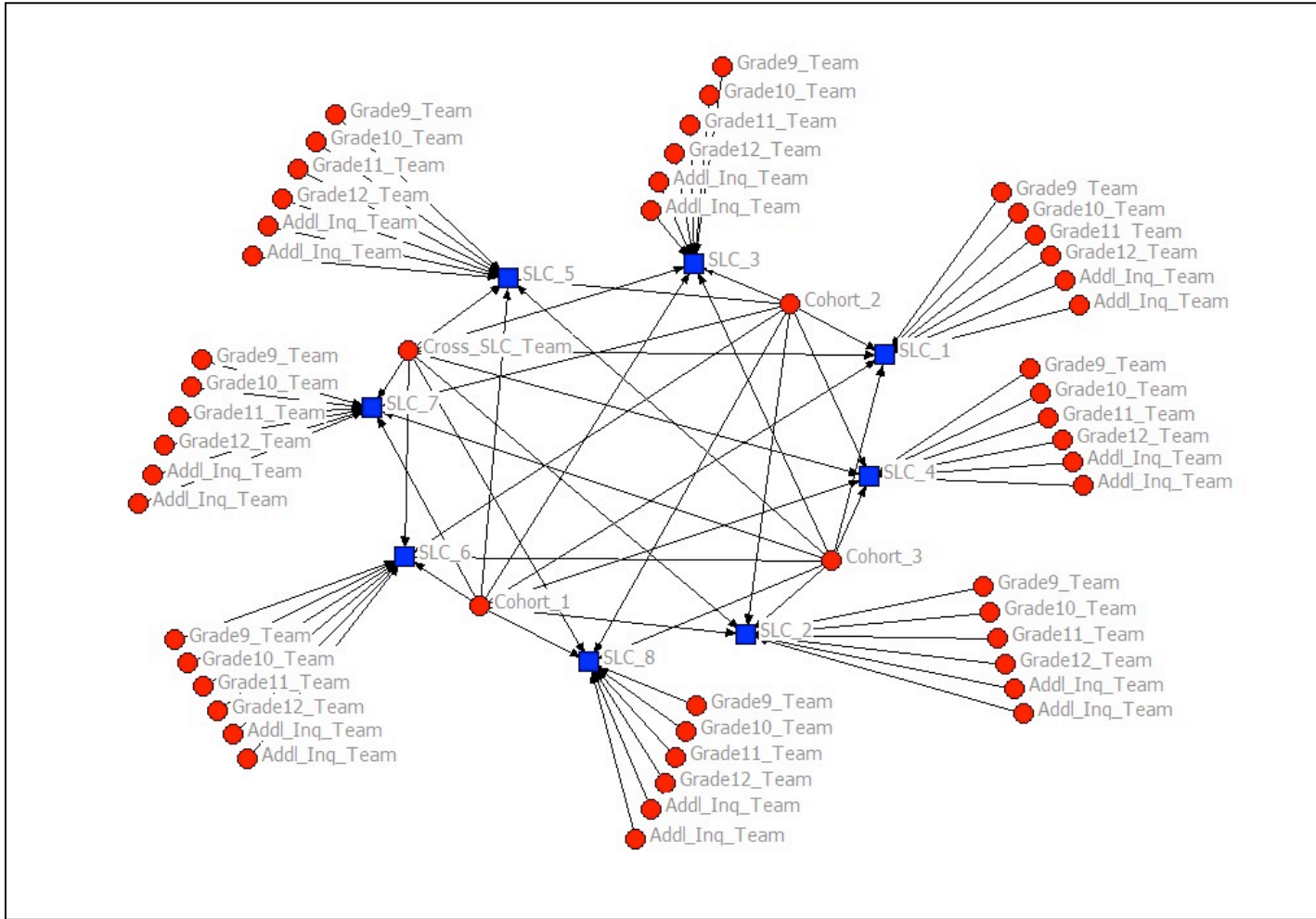
Anne pointed out that when she had attempted to institute similar external professional development at Inverness in the past, her staff had overwhelmingly rejected the idea and had not engaged with the materials. However, when Inverness' teachers identified through their own inquiry trial and error that writing was the main struggle for their students, they owned their decision-making process and the needs that it yielded, and requested school-wide writing PD. As Anne described, "now they want to know how do they use [her rubrics] and differentiate in a class. So it's about them wanting and needing it when it's real and ready, when the staff was ready for it. Five years ago if I brought her in, there would have been a disaster. Nobody would have wanted to listen to her…But now they listen to every word, and they hold onto her."

In 2010-11 and beyond, Inverness teachers continued their cycles of inquiry through pre- and post-assessment design and evaluation, sharing results with colleagues, and revamping intervention strategies based on results. They also began to have conversations with individual students around their own data on a regular basis. In addition, the discussion of student work across content area lines in SLCs had gradually become commonplace. As a result, teachers had an increased awareness of student progress and expanded their own sphere of understanding about students' outcomes across different classes.

When Inverness teachers reflected on the direction in which Inverness had moved over five years of developing and growing a culture and network of inquiry, they always returned to the original and persistent challenge of going small and Carrie's systematic pushing. DLP teachers noted:

You don't even know where to begin with the skill. Just had Carrie keep saying, "Well it's got to get smaller than that. It's too broad of a skill." And just *that* process is second nature now: targeting a skill and moving them. It's amazing.

…We'd heard of [the writing consultant's] process for awhile, here and there. And Carrie had presented to us as a department and as coordinators. And it just seemed…I don't want to say "too simple"…but it was very nuts-and-bolts: sentence structure, grammar. And there was a point where we realized, "As high school teachers, no, we didn't sign up for this. But it is what the kids need." And there was even a little resistance to going back to simple…teaching freshmen "What is a sentence?" This year some freshmen will be starting with that. Like, "Are you serious?" But then, within a few weeks, as you're making complex sentences and talking about subordinating conjunctions, freshmen know they need to know how to write a sentence. A well-developed sentence. Expanding that to a paragraph. So we always felt freshman year you should know what an essay is. But we couldn't just keep saying they *should* know it; they *didn't* know it.

There is an important note about inquiry networks and their representations in Inverness (and recalling those of Glades as well). In the case of Glades, as previously noted, edges (lines) represent individuals belonging to teams, while at Inverness edges represent groups of individuals belonging to cohorts. The cohort at Inverness is the means of inquiry training and spread. The figures below represent in an efficient way how inquiry grew at Inverness. Graphing all individual memberships would produce a dense sphere that would not yield meaningful information about the organization of units around inquiry, which units served as the vehicle for its spread. SLCs at Inverness each developed and continued several grade-level teams during the period of the study, and there was a great deal of coordination and spillover between DLP and SLC inquiry teams. At Glades the work of doing inquiry within SLCs was only underway during the study. At Glades inquiry network growth was gradual and information flow took place through individuals between DLP teams and SLCs. At Inverness network growth was much more dramatic: cohorts were comprised of different teams and growth and information flow took place between cohorts (comprised of multiple teams and individuals) and SLCs.

Then the SLCs in turn developed their own grade-level teams. Demonstrating the level of

interconnectedness around inquiry at the sites is one of the main goals of analysis. This

expansion, however, was not only structural: the qualitative content of relationships has

to do with the level of interconnectedness of practice around inquiry. Inverness' inquiry

stage was one where cohorts of inquiry participants had created bonding and bridging

capital that cut across various organizational units within the school.

Distributed Leadership

Part of the context unique to how large high schools implemented DLP, in

comparison to their smaller counterparts, was the greater number of staff that engaged in,

spread, and established a networked community of practice around inquiry. Large high

schools need to develop, coordinate, and organize broad leadership in order to bring

about and maintain change. This factor made delegating responsibilities and distributing

leadership around inquiry key to the program's success. Anne was an important advocate

of DLP and her participation in and legitimization of the program were key supports for

its growth. Anne handpicked inquiry as a strategy for school-wide improvement. She

used it to ground restructuring and the other main initiatives for change instituted at

Inverness starting in 2006. As a result, her initial buy in for inquiry was greater than at

other sites. Her honesty, transparency, and communication about her own challenges with

DLP modeled a learning stance for her staff in a highly authentic way that was successful

at eliciting teacher buy-in. According to DLP 2 participants:

> In terms of our cohort meetings [Anne] plays a strong role with us. But I think the
> role she's playing with the SLCs and DLP is to kind of set us in the right
> direction,,,. And so I would say she does organize things, but she seems to be kind
> of hands-off with some of the things…I find her very supportive…And
> honest…She really bought into this. And she's got her heart in the right place. She
> really wants to see this school turn around and do better. She gives a lot of hours

to this as well. After school she's with cohorts. And I think you really have to find a principal that's really going to be willing to do what *you're* doing. She doesn't expect us to do something that *she's* not doing. She didn't go through just the first cohort, and figured this out with everyone as a student…Right. She struggles as well.

Other teacher focus groups observed similar patterns about Anne's transparency around challenges and strategies for addressing them. Teams pointed to her accessibility around these and other issues as crucial supports for their own adoption of inquiry practices and beliefs:

[She acted] as a staff member, as us. And now coming back and helping us and being honest about…you know, "In the first cohort there was a lot of bumps and turns that they had to figure out, and they were able to realize what worked and what didn't work…And so you know what? We figured this out; I'm not going to stress you like that"—and being very open about that. She's very supportive of anything you need for this. Anytime. She has an open door policy. You can come in and ask her for anything. She…makes sure you have things. She tells the APs also to help us out—who have been. So, overall, she's honest, supportive, open…It's also a sense that it's voluntary on our part…She doesn't make you feel like you *have to* do this…There's no exclusion. And everyone…it's open and available to everyone. We were encouraged. It's very important.

Anne reported moments of increased understanding around inquiry, but was also completely upfront about the struggles that preceded these. In 2009, she asserted:

And I think back to the original DLP: why it was effective? Because I was part of it too. And if I, as someone who was already obviously a principal and didn't need supervision credits and wasn't taking DLP for credit but felt it was significant enough for me to sit there and give my opinion and be part of a team and work the same work that they were doing (I mean I didn't do *everything* they did, but I did a large part of it), it showed that I believed that it was important enough to be part of it. And, for me, I think it was important for me to be up there the other day with [her] in the building so that I didn't think that they only needed to hear what she had to say, but that I too was wanting to hear what she had to say for school improvement.

Anne did not distance herself from the "messiness" (as DLP participants at several schools described) of the iterations and uncertainty of doing inquiry work. She pointed to mistakes that she thought she had made prior to implementing inquiry. She articulated

how DLP shifted her thinking about distributing leadership for school improvement to

her staff and providing them the venues to identify and request the professional

development they needed to move more students. She explained the process of bringing

in an external writing program and consultant:

> I've learned from my mistakes. You know. I used to empty the school out—
> "Yeah, go to that workshop. Go to that workshop. Go to that workshop. Come
> back, turnkey it." The bottom line is, it never really gets turnkeyed. People pick
> up one or two or three tricks from wherever they went, and they put it in their bag
> of tricks, and they use it from time to time. But they never walk away with a more
> enriched classroom. They never walk away and develop a more enriched
> classroom environment from a workshop or a series of workshops…So the band-
> aid approach really doesn't work…It's about more preventative work. Having the
> teachers work together in common time—which I consider to be one of the best
> professional development tools that we ever had—and really coming up and
> synthesizing what it is that they need to improve in the classroom to improve
> these kids' academic standings, is *so* much better—because we change
> *everything*.

Anne was transparent, modeled behavior, and strategically delegated

responsibilities for building a collaborative network around inquiry. As a result,

Inverness' teachers reported their ownership of inquiry as "how we do things here" much

more frequently than at any other school. Anne observed that:

> They know it's theirs. And they don't point to anyone else now and say, "*You've*
> got to…I think that is. And I think the fact that in order for this to sustain itself
> there has to be that constant communication. You can never go backwards right
> now. They've learned to collaborate, they've learned to plan together, they've
> learned to communicate, they've learned to share. And now you can't put them
> back in the boxes of their classroom and tell them to just go forward without that
> conversation.

Inquiry spread to one hundred percent of Inverness' staff. Anne had slowly but surely

given her teachers the opportunity to put their inquiry practice to work in decision-

making around professional development. Teachers would marshal evidence to advocate

for the inquiry practices and continued training that would be most useful for developing

their skills to help their students. According to Anne:

> I kind of stepped back—for a number of reasons. One is because I just feel like,
> look, the bottom line is, I'm not gonna be here forever…And I just think that
> sometimes they tend to depend on my advice or my direction all the time…And
> they don't have to… I have a really bright crew of administrators, and they work
> very hard.

School Inquiry Measures

Inverness' inquiry network grew steadily in both density and connectivity

between 2006 and 2011. DLP and SLC structures eventually included all staff on at least

one team. The percentage of Inverness staff practicing inquiry grew from 25 to 45

percent between 2006 and 2007, 40 to 60 percent in 2007-08, and plateaued at 100

percent in 2008 and beyond. Extensive qualitative evidence confirms and explicates these

trends. Paired t-tests assessed whether differences over time in mean values on scales

measuring school-wide inquiry outcomes were significant (Table 16 shows a comparison

of differences).

Table 16. T-Test Results Comparing Inquiry Outcomes Across Time: 2008 to 2010

Outcome Measure	$M1_{2008}$	$M2_{2010}$	Mean Diff	t	P-value
Supportive Learning Environment	3.24 (0.10)	3.35 (0.07)	0.11	1.28	*0.09
Collaboration on problem solving	2.97 (0.10)	3.15 (0.08)	0.18	2.06	**0.02
Trust and shared accountability	3.90 (0.12)	4.10 (0.08)	0.20	1.65	**0.05
Collaboration on instruction	3.98 (0.11)	4.12 (0.08)	0.14	1.31	*0.09
Collaboration on assessment	4.27 (0.12)	4.28 (0.09)	0.01	0.06	0.48
Leadership for professional community and network building	4.03 (0.12)	4.15 (0.10)	0.12	1.29	*0.09
Leadership for data-based improvement	4.28 (0.08)	4.35 (0.07)	0.07	0.94	0.18
*p ≤ 0.1, **p ≤ 0.05, ***p ≤ 0.01					

T-tests detected significant increases in school-wide averages between 2008 and 2010 on supportive learning environment, collaboration on problem solving, trust and shared accountability, collaboration on instruction, and leadership for professional community and network building. These findings are in line with an overall increase in network connectivity at the school. There are compelling reasons to believe, therefore, that teachers on the whole experienced an increase in collaborative inquiry, use of evidence to drive instructional decisions, and trust and a shared vision and accountability for students' success, among others.

Despite overwhelming success at infusing inquiry practices and beliefs into the daily work of Inverness as a whole, as Anne and her staff noted, there was always room for improvement. Although, on average, Inverness grew to have a densely interacting and growing network around inquiry, inquiry outcomes disaggregated by SLC showed

variation across communities.[45] Interviews and focus groups suggested that inquiry leadership was not equally strong across SLCs, and could be one potential mechanism that influenced differences in SLC outcomes. DLP participants, school leaders, and DLP and school facilitators pointed to the fact that level and effectiveness of collaboration between DLP participants and SLC leaders was also not consistent. More data are needed, however, to explore these hypotheses.

Looking Ahead and Conclusion

By spring of 2011, inquiry practice and a strong belief in inquiry as an effective school improvement, had taken hold of the way of life at Inverness. Anne and Carrie had successfully strategized and built up a leadership threshold across all eight SLCs, through successive cohorts of DLP participants that modeled inquiry and coached one another as peers. After Cohort 3 completed their formal stint as DLP trainees, staff as a whole infused inquiry practice in each SLC. Inverness leveraged the incubation and growth of inquiry teams and work within SLCs. The school had made extensive inquiry and student achievement gains. Anne, however, in her constant learning stance explained in 2010 that despite teachers' ownership of the DLP process she felt that things had come to a bit of a halt:

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[45] SLCs were tightly clustered on supportive learning environment measures, with only a 0.7-point spread between 2008 and 2010. SLC 3's supportive learning environment growth exceeded all other SLCs'. Four of the SLCs showed growth on this metric, one stayed constant, and three declined. Collaboration on problem solving had a large spread and one that was almost twice the size of that of supportive learning environment. SLC 8 showed a marked drop on this metric, with SLC 7 dipping a little less but still substantially. Except for SLC 1 and 2, all others made gains on trust and shared accountability, but were overall much smaller for all SLCs than on other measures. This could, however, be due to the fact that SLCs were tightly clustered at a higher level on this measure, between 3.5 and 4.5 points. Collaboration on instruction hovered at a higher level as well, ~3.5-4.5, but results were mixed, with about half the SLCs showing losses and the others gains. Collaboration on assessment had relatively small variation among SLCs, and had about half the SLCs decline and the rest increase over time. Except for SLCs 7 and 8, all other communities reported a growth in leadership for professional community and network building. Leadership for data-based improvement showed a high and consistent growth or plateau.

But as long as it's their idea, it works out better. So they get to see it. We're a little stagnant in the inquiry work, which is… I feel like we're hitting a wall right now. And so do the APs. Feel like we already know what our weaknesses are…I think the piece that we kind of dropped—because it was the hard piece, which was the low inference observations—kept a pulse on the instruction, and we don't have that going on right now. Because it was hard, because teachers resisted, we kind of pulled back from that to keep them…They're seeing 100 percent that you can't just have a chalk-and-talk lesson and expect outcomes. They're seeing that. But now they're stuck with "What's next?"

The principal was not alone in sensing that there was always room for refinement with a moving target. Near the end of the study DLP participants spoke as researchers would about continuing to improve the systems in place to identify target groups, learning targets, and most important, student interventions:

We've developed a gut now. We know exactly where to start [and] where to go. We have a process. And so now instead of having this trial and error moving target thing, we've got a system…And it still changes! And it's *going* to change. Because in any data driven research, the goal isn't to prove what you're looking at; it's to revise your hypothesis and look further. And I think that's what Carrie was trying to get at. "Now that you've done this, okay. But *now*… This isn't the answer. Because it's never the answer in science. Now you have to revise your hypothesis and continue to research." And that's what keeps scientists—and now teachers—in business: continuing to revise our hypothesis to make it better.

Anne observed of herself and her teachers that "I think we really know our holes. I mean we examine them *every single day*…here last night I go and plug those things in and write to everyone at…11:00: 'Guys, I've got bad news. If we use this year's metrics with last year's numbers, we go back down to a [worse grade] again.' Which is devastating for us with all the work that we're doing." She frequently shared her data and conclusions about how Inverness was doing not only with district-level personnel, but also with her own colleague network. These fellow principals included those at Glades and at Jocelyn.

Jocelyn, Glades, and Inverness high schools illustrate distinct developmental stages of building a networked community of practice around inquiry. The following comparative analysis of schools' outcomes on salient measures of inquiry practice and spread illuminates differences in schools' approaches to DLP and the situative processes that drove inquiry.

CHAPTER 7: COMPARATIVE ANALYSIS AND FINDINGS

In 2010, Glades' principal observed that DLP 3 teams "had really become their own professional learning community." When reflecting about the extent to which inquiry had spread, Glades and Inverness DLP 3 participants echoed the sentiment that "everything is interconnected, it's not separate…our whole school is a community, the individual SLC communities, our administrators allowing us to be involved in their process of decision-making, the way we work within DLP [cohorts]…the school." This dissertation was concerned with how teams become their own communities of practice, how outside help can strategically facilitate this transition, and most importantly, how in turn these teams of practitioners can establish networks around inquiry. The study also investigated different stages of inquiry efforts and distinct social capital levers used to grow networked communities of practice. This chapter compares baseline conditions, inquiry work and relational processes, and inquiry outcomes at Jocelyn, Glades, and Inverness.

Getting Started: Schools' Inquiry Readiness

Table 17 summarizes and compares starting conditions salient to inquiry. All three schools served large proportions of minority and economically disadvantaged students. All had stable cadres of staff thanks to low mobility in leadership and teachers. Inverness and Jocelyn enrolled students from some of the same neighborhoods, while Glades was located in a different part of the city. The spouse of Jocelyn's principal was an administrator at Inverness. The schools' principals had known each other for years and communicated on a regular basis, due to their joint participation in SLC and principal network meetings. All sites implemented an intensive version of DLP 3, including

seminars and training with DLP facilitators. Inverness never included a certification

component while the others did.

Table 17. 2008 Jocelyn, Glades, and Inverness Baseline Conditions

Condition	Jocelyn	Glades	Inverness
Student population	Almost half minority; over half low SES	Two thirds minority and low SES	One third minority; half low SES
DLP version	Intensive w/certification	Intensive w/certification	Intensive no certification
Previous DLP cohorts	None	Two cohorts; graduates were SLC heads and data specialist	Two cohorts; graduates were SLC heads/APs
School culture	Somewhat supportive learning environment; resistance to change and limited history of collaboration	Somewhat supportive learning environment; some history of collaboration around instruction in content area departments	Very supportive learning environment; extensive history of collaboration around instruction in content area departments and some around data
School organization	Comprehensive: Subject Departments	SLCs x Subject Departments	SLCs
DLP role in restructuring	n/a	Restructuring direct result of DLP Cohort 1's work	Principal was planning on restructuring; built DLP model into restructuring
Principal stance	Open to DLP; not strategic; no strategic vision for DLP	Open to DLP; reformed by DLP and propelled by it into change	Open to DLP; strategic vision for DLP from the start and used DLP to drive her vision of change
DLP architects	No prior relationship w/principal	Existing relationship w/principal	Existing relationship w/principal

Many similarities existed between Inverness and Glades, and their staff and

administrators sometimes referred to them as "parallel places." Both restructured from a

comprehensive model to SLCs early on in their DLP work. At Glades, teachers' and

administrators' DLP work unearthed and drove the need to shift to communities. By

contrast, Inverness' leaders planned the school's restructuring in 2005-06, embedded

DLP into this plan by training the first cohort of participants in preparation for their

transition to APs/SLC heads, and moved to SLCs in 2006-07. DLP architects supported

both the transition to restructuring and DLP as a school-wide reform strategy from the

start.

Jocelyn's DLP roots differed somewhat from Glades' and Inverness'. Frank, the principal, had not taken on the agenda to restructure the school and piloted two SLCs. He did not have previous ties to DLP or its architects. He learned about the program through his conversations with Glades and Inverness principals, and his wife, an Inverness administrator. Frank wanted to shift staff to a mode of evidence-based practice and to increase their ownership over student success. He faced pressure from the DOE to create inquiry teams in his school (the school got ratings based in part on how well it implemented inquiry). Frank was looking for a vehicle for whole-school improvement, and tried to emulate the success that DLP had in achieving this at his colleagues' schools. Unlike his peers at Glades and Inverness, however, Frank did not: have a deep knowledge of the model or a strategic vision for how to roll out DLP; provide mentorship and develop leadership qualities in DLP 3 participants; or legitimize and publicize inquiry to facilitate DLP 3 teachers' efforts at building a network of colleagues around this practice.

Inverness moved to SLCs the same year as Glades. In Glades, SLCs emerged as new structures with distinct leaders (directors) from content area department heads (APs), which resulted in confusion over responsibilities and a period of transition for teachers and school leaders alike. By contrast, at Inverness SLCs absorbed departments and former department heads (AP equivalents) were re-assigned to head up SLCs. Glades' facilitator observed that "the Inverness model has more heavy emphasis on the APs and some of those leadership roles." Hence, while both schools demonstrated success with spreading inquiry and having teachers build a network around this, the processes that led to these changes were distinct. At both sites, however, the SLCs created supportive and

more personalized learning environments for teachers, and provided increased
opportunities for collaboration, which were both vital to inquiry.

Since Jocelyn did not pilot two small learning communities until the end of the
study, data are not available to document their outcomes as incubating units for inquiry.
We do know, however, that until 2010 when Frank launched the communities, the only
structures for collaboration available at the school were content area departments. The
culture in these departments, as well as Jocelyn as a whole, was highly resistant to
change; there was also a history of limited teacher collaboration. These two conditions
created a setting that was not ideal for beginning DLP, but also one where the program
could have been successful had the principal and DLP facilitator collaborated
strategically to train and mentor DLP 3 participants.

Returning to Inverness and Glades, there were several key differences between
the structures and qualitative processes in place in 2008 that influenced the pace at which
teachers built a network of practice around inquiry and how this community functioned.
Inverness' first large DLP cohort had no inquiry support in SLCs, built inquiry practice
from the ground up, and mentored subsequent cohorts. The principal and DLP facilitator
expected these teachers to lead inquiry and school improvement in not only their own
SLCs, but also school-wide over time. By contrast, Glades' first large DLP Cohort (3)
already had an extant and supportive inquiry base, as SLC heads had undergone DLP
training and principal mentoring. Glades and Jocelyn's first large DLP Cohort (3) was
comprised of several loosely organized teams. By contrast, Inverness' first large DLP
Cohort (1) was already comprised of eight teams under the principal's vision for inquiry

linked to SLC restructuring. Inverness' Cohort 3 was larger, more supported, and organized than its counterpart at the other two sites.

Process: Three Different Inquiry Journeys

Baseline conditions created different settings for inquiry practice and spread. Inverness and Glades may have been more conducive to DLP taking hold initially than Jocelyn was. However, a combination of strategic vision and support for DLP from the principal, and facilitation aligned with this strategy from the DLP facilitator, could have made the difference for success in Jocelyn as they did at the other two sites. The key processes behind schools' relative success or lack thereof with implementing and growing inquiry were the training that DLP 3 teams received from their facilitators, and how the latter worked with principals. Table 18 summarizes and compares relevant inquiry work and processes at the three sites in 2008-2010.

Table 18. 2008-2010 Inquiry Work and Processes

Dimension	Jocelyn	Glades	Inverness
Team composition	Homogeneous: less experienced teachers and one content area dominant on each team	Heterogeneous: years of experience and content areas	Heterogeneous: years of experience and content areas
Team dynamics	Somewhat collegial; did not rotate roles; access to target students and content area expertise not equitably distributed among teams, hence inequitable distribution of work among teams	Collegial; rotated assignment roles; equitable distribution of work within and among teams	Collegial; rotated assignment roles; equitable distribution of work within and among teams
Common planning time	No	Yes: 1x/week within SLCs	Yes: at least 2x/week within SLCs, specifically for inquiry
DLP facilitator's time on site	One day a week; increased to two days a week in second year of DLP 3	Two days a week for one; daily for the second	Two days a week
DLP facilitators and their role	One outsider who did not become insider	One insider and one outsider who became insider	Highly-embedded insider
DLP facilitator effectiveness	Strong facilitator	Outsider very strong facilitator, and supported insider in also becoming strong facilitator	Very strong facilitator (one of DLP architects)
DLP and principal interaction	Weak collaborative; irregular communication	Collaborative; facilitators established boundaries to share roles during leadership portion of trainings; very frequent communication	Strong and strategic collaborative; very frequent communication
Principal's role in DLP	Supporter; did not publicize DLP consistently; did not legitimize as priority for school; infrequent and passive observer at DLP trainings; cautious stance and lack of vision for DLP direction	Strong supporter; publicized and legitimized DLP as priority for school; active participant in DLP trainings; experiential vision	Strong supporter; publicized and legitimized DLP as priority for school; active participant in DLP trainings initially and scaled back once leadership more broadly distributed; highly experiential vision for continuous improvement through DLP/inquiry
Distributed leadership	No	Yes; somewhat	Yes; highly
School facilitator's role in DLP	Directive	Weak	n/a
Additional data roles at school	None	Full time data specialist (former Glades teacher and DLP 1 graduate)	Central data team
DLP knowledge	Primarily DLP facilitator	Primarily DLP facilitators and principal	DLP facilitator; cohort to cohort

transmission mechanism			

Team Composition and Implications. Teachers on DLP 3 teams at all sites pointed to a motivating interest in systems thinking and broader changes as reasons to join the program. DLP 3 teams were heterogeneous with respect to content areas at Glades and Inverness, but not at Jocelyn. Mixed content area teams had a comparative advantage, in that there was a higher chance they would have direct classroom access to at least some if not all target students. Having multiple subjects represented ensured that whatever learning skill the team chose to focus on, based on examining assessment and other data, it would have a member who could provide expert content knowledge to inform assessment and instructional intervention design. Jocelyn's math team struggled with both these issues. When the DLP 3 Cohort selected to focus on literacy as a target area for students, math team participants articulated their frustration at the disadvantage they had compared to the English team. They did not teach any target students and did not feel equipped to assess literacy skills or design appropriate classroom interventions.

Compositional issues coupled with the fact that Glades and Inverness teams represented different SLCs and had units through which to spread inquiry, while their Jocelyn counterparts did not, severely curtailed the latter's ability to build a network. Teachers' number of years of experience was another compositional issue that made a difference for teams' capacity to build relationships. Glades' DLP 3 teams were heavily skewed towards teachers who had taught for at least seven years (many had taught for ten or more, with some nineteen and twenty). Inverness teams were more balanced, with some long-time teachers and other teachers with three to five years of experience. Having a critical mass of veteran teachers made a difference for teams' comfort levels with

respect to: willingness to reach out to colleagues to observe classrooms; sharing inquiry findings; and trying to enlist others to use evidence-based instructional interventions. By contrast, at Jocelyn, teams were composed of at least half novice teachers with around three years of experience. Some of these teachers had not yet received tenure and did not want to create too many ripples in the school's extant culture of resistance to change. These more junior teachers never felt comfortable spreading the word about inquiry or asking colleagues to use interventions and other evidence-based practices.

Team Dynamics. Team norms that made a positive difference for inquiry included rotating roles for DLP assignments. This ensured that team members did not coast by on extant strengths and had to step outside their comfort zones and develop a broader range of skills. Glades and Inverness teachers practiced these routines, with some prodding from facilitators. Despite the Jocelyn facilitator's efforts to instill these habits in her teams, one of them deeply struggled with rotating and distributing responsibilities, and stunted members' capacity to develop inquiry skills.

Common to teams at all sites was the feeling that they had initially stumbled with their assignments. They would have liked to work with facilitators on identifying a target group of students more quickly. Glades and Inverness principals instituted common planning time for inquiry teams during the day, as a lesson learned from this feedback. One of the Glades teams had this time in place from the start and others saw how effective it was at improving work pace and communication. Team members brought the issue up with the DLP facilitators and school principal, who transitioned to a school-wide common planning time for inquiry teams the following year. At Inverness, school leaders instituted common planning time at least twice a week within SLCs, specifically for

inquiry. Leadership at Jocelyn never formalized common planning time; one of the school's teams carved common planning out on their own, but the other never did.

How Facilitators Worked with Teams and Principals. Site staff and leaders lauded their respective facilitators for their expertise, accessibility, support, and strategic facilitation. At Glades a duo of facilitators, one of whom was an AP at the school and the other an expert outsider, forged a successful collaboration with each other and the principal. Lily supported Jeff in finding his voice as a facilitator. She helped him build up his capacity to lead inquiry trainings through modeling effective facilitation skills. Although their interaction was not without some misalignments, they were effective at resolving issues due to regular and open communication, a shared set of goals and vision for DLP implementation, a respect for and blending of each other's perspectives as insider and outsider, co-planning of the trainings, and the need to craft a united front in their interactions with Glades' principal. He was very effective at leading and supporting DLP, and positioned himself as an expert with regard to the low inference observations and leadership training program components. This behavior interfered somewhat with Lily and Jeff's trainings. The three engaged in continuous sense-making together to define and delineate the roles they would play at the trainings in order to best support DLP 3 participants.

Over time, Lily grew to be accepted at the school as more of an insider, due to her effective collaboration with Jeff, approachability and expertise, and that, as she dedicated two full days a week to Glades, she built up an insider's understanding of personnel, culture, and systems. A similar story unfolded with Carrie at Inverness, except that she became embedded in and accepted practically as a staff member. DLP participants

praised her work ethic and expertise in the same way as their counterparts did with Lily and Jeff. She was known and begrudgingly appreciated for her relentless strategic pushing to go small (with learning targets and target groups) and stay small in order to bring about big change. As Anne's (Inverness principal) vision for DLP was as a school-wide improvement strategy embedded in SLCs, Carrie interacted with virtually the entire staff. Her facilitation and DLP work had a large scope. When Inverness began a staff-wide writing and professional development initiative that stemmed directly from DLP, she continued working with teachers on this non-facilitation front as well, which was not typical of DLP facilitators. Anne and Carrie worked very closely together and shared a vision for how to fold DLP into SLC roll out and how to build a network of practitioners around using evidence to drive instruction.

Jocelyn principal and staff were as pleased with Laura's facilitation skills and dedication as Glades' and Inverness' were with their facilitators. She was at the school just one day a week and never developed the deep knowledge that Lily did at Glades nor became embedded in the school's life in the way that Carrie did at Inverness. Although she recognized this scheduling disadvantage and by her second year had increased her time on site, this was too late. The main roadblock to Laura making headway with supporting DLP 3 teams was a dysfunctional dynamic with the school's facilitator (Samantha) and principal (Frank). Lack of communication and boundary-setting early on resulted in misalignment in understanding around DLP and the role that each of the three was to play in it, and a lack of common vision around its goals and outcomes. Jocelyn's school facilitator was over-involved not only in DLP, but in many aspects of school management. Samantha ran the leadership development part of DLP, which DLP

facilitators led at other sites. Although her role as school facilitator was to work in a supportive capacity with Frank, she came to function "practically as an AP." She interfered with Laura's role as facilitator. The two did not have clarity as to what DLP responsibilities each of them should limit their respective focus. During the second year of DLP 3, Frank asked Samantha to step back and began one-on-one planning meetings with Laura. However, the dysfunction was already apparent to DLP 3 teams and it was too late to recover and build new routines.

Both Inverness' and Glades' school facilitators were largely absent from DLP and did not interfere with program facilitation or DLP facilitators' ability to work directly with principals. At Jocelyn, by contrast, the school facilitator got involved with DLP to a level outside the scope of her responsibilities. She curbed Laura and Frank's ability to be strategic collaborators around the program and interfered with Laura's DLP facilitation at trainings.

Outside facilitators were the key players whose support and expertise helped DLP teams to go and stay granular with data, identify target groups of students and learning targets, design formative assessments, recruit colleagues, and lead change. Clearly, however, DLP facilitators' success depended on their interaction and strategic collaboration with the extant leadership fabric at the school, comprised of the principal, SLC heads/APs, and school facilitator.

Principals' Role in DLP Spread. All three principals wanted DLP to be a powerful lever of change at their sites. They believed it to be a means to bring about collaboration, distributed leadership and ownership over student learning, and a network of practice around evidence-based decision-making. They impacted the program and

participants' success at network building in three ways: legitimizing DLP and inquiry with the rest of the staff; mentoring DLP participants to see themselves as leaders of change; and providing opportunities for DLP participants to share work with and recruit staff.

Glades' principal was an active seminar participant, particularly in the leadership component of the DLP. His coaching with teachers empowered them to ask probing questions about school culture, engage in systems thinking, and involve colleagues in inquiry. He legitimized and directed the use of inquiry as a vehicle for whole-school change. He communicated clearly and consistently to all staff that he expected them to use evidence to drive practice and instructional decision-making to close gaps for under-achieving students. He helped mitigate mistrust and resistance to DLP participants' classroom observations of fellow teachers, by making it clear that these would not be used for evaluative purposes. He moved DLP 1 and 2 graduates into leadership positions, as SLC heads, APs, and data specialist, to provide capacity and support for inquiry in every SLC.

Inverness' principal committed to much the same course of action as Glades'. She legitimized inquiry with her entire staff and made it a clear priority for the building. She was less involved in the training seminars. Since she and Carrie co-planned goals and outcomes for these, her behind-the-scenes presence was known and felt, even when she was not physically present. Like Glades' principal, she trusted her teacher and SLC leaders. She scaffolded them to take on increasing responsibility around starting grade-level inquiry teams, recruiting colleagues through interdisciplinary conversations in SLCs, and conducting school-wide professional development around inquiry and student

gain results. Anne's vision, however, distinct from the Glades principal's, was one of continuous improvement. When teams and staff reached one plateau of comfort, she would press them on to the next. In this way, she moved her DLP 1 Cohort trainees into leadership positions with teacher support at each SLC; pressed successive DLP cohorts to mentor each other and maintain and build a community of inquiry; had cohorts lead a school shift to grade-level inquiry teams; instituted a school-wide writing professional development at teachers' urging and based on inquiry results; and eventually pushed to have every teacher involved in "inquiry-of-one" in their own classroom. These strategic moves did not take place in a vacuum, and each one was carefully planned and executed with Carrie.

Frank's approach to DLP and inquiry was much more cautious and hands off than his colleagues'. He wanted DLP to bring about change at Jocelyn, but did not develop a strategic vision or plan for how to do this. He wanted to distribute leadership, but never did. Perhaps he did not wield the centralized authority to do so, as he saw some assistant principals as barriers to change. Unlike Glades' principal, he did not move to engage the APs in a change process that challenged their views and prompted them to commit to a vision or move on. He did not scaffold or mentor DLP participants, so that it would have been prudent for him to feel comfortable with them running their own larger inquiry teams and staff-wide professional development. He wanted to radically change the structure and culture of his school to combat a resistance to change that was entrenched in his departments; however, he never dived into SLCs. He did not advertise or prioritize DLP widely or consistently as a lever for change. This impeded DLP 3 participants in

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getting buy-in from colleagues around trying evidence-based instructional strategies and classroom observations.

Frank also did not leverage his DLP facilitator's expertise or work strategically with Laura to develop and execute long-term plans for inquiry. After seeing the success that DLP had at Glades and Inverness, he underestimated the amount of strategic behind-the-scenes push that these outcomes required from a principal. Finally, he let his school facilitator take over many duties at Jocelyn that were outside the scope of her role and interfered with DLP. Frank had access to the same resources as principals at Glades and Inverness, vis a vis expert facilitation and DLP architects. He did not take advantage of these and lacked the vision to create a strategy for rolling out DLP, that the other two sites had used to build a network of inquiry practitioners.

Steady Work Continued: Inquiry Outcomes

At the end of the study in spring of 2010, Jocelyn, Glades, and Inverness had all participated in DLP for at least three years. Seventy-five percent of Glades' and one hundred percent of Inverness' staff was participating in some type of inquiry, whether through DLP, grade-level, or SLC-based teams. The thriving networks of practice that successive DLP cohorts established continue to refine evidence-based practices and recruit additional colleagues well into the present. Jocelyn's third DLP cohort was not successful at establishing a network of practice. After Cohort 4 broke apart due to conflicts with the DLP facilitator, the program lost traction. Staff reporting inquiry participation plateaued at 19 percent. Table 19 summarizes and compares network and practice outcomes at the three sites in 2010.

Table 19. 2010 School Inquiry Outcomes: Network, Spread, Colleague Involvement, and Practice

Outcome	Jocelyn	Glades	Inverness
Number of DLP cohorts	2	5	3 official and 3 subsequent waves of teachers participating in inquiry practice and expansion
Percent of staff involved in inquiry	19%	75%	100%
Number of practicing inquiry teams and teachers	5 inquiry teams (1 data team, 3 DLP teams, and 1 non-DLP inquiry team) -23 teachers total at the school	30 SLC and grade-level inquiry teams -90 teachers total at school -51 DLP 1, 2, 3, 4, and 5 participants total	60 SLC and grade-level inquiry teams -All 120 teachers on some kind of inquiry team
School-wide inquiry practice	Not successful	Success; plateau and saturation point reached; standstill in expanding systems of evidence-based practice	Growing and continued success; ongoing refining of systems
Network and spread	No network; isolates	Dense network w/shared connections across DLP teams and SLCs; connectedness can still increase	Dense network w/shared connections across multiple organizational units: SLCs, grade levels, and content areas
Primary organizational units for inquiry	None	SLCs; content area departments (limited)	SLCs; classrooms as teachers moved to conducting "1-member team" inquiry in their own classrooms
Staff leadership for inquiry	None; DLP 3 graduates did not move on to occupy leadership positions	DLP 1, 2, and 3 graduates; SLC heads; data specialist	SLC heads; cross-SLC data team; broadly distributed through SLCs and grade levels

Glades staff and leaders reported that through a "critical" and connected mass of teachers, the school had reached a "saturation point" with respect to inquiry. DLP participants perceived their next task to be that of continuing to expand systems of evidence-based practice and eventually involving all teachers on some type of inquiry team. Inverness, which had reached this goal, continued attempts to improve systems and organizing principles at the school. The intent was that all collaboration about student progress would revolve around examining student work and responding with appropriately designed and monitored classroom interventions.

Jocelyn DLP participants got stuck on inquiry spread when they ran against colleagues' resistance to change, including to collaboration and evidence-based practice. Although this type of pushback had not disappeared entirely from Glades and Inverness, DLP participants there found great success in using the following strategies to address it: they shared and discussed both student data and classroom observations with colleagues, with a clear focus on students; they over-communicated that the purpose of inquiry was to improve outcomes for the entire school, rather than assign blame for lack of student progress to individuals; and they continued their school-wide professional development around inquiry.

Both Glades and Inverness developed dense inquiry networks over time. As the number of teachers engaged in inquiry and the number and types of inquiry teams grew, so did the shared memberships among organizational units that incubated inquiry (SLCs, grade levels, and departments). Jocelyn, by contrast, never launched a network, and inquiry teams operated primarily as isolates without shared memberships (Figures 20-22 show a side-by-side comparison of the sites' 2010 inquiry networks). As connectivity at Glades and Inverness grew, so did staff leadership for inquiry. At Glades this came from DLP Cohorts 1, 2, and 3 graduates, who were SLC heads and the data specialist at the school. At Inverness SLC heads and APs became inquiry "go-to's," but inquiry leadership was broadly distributed to the rest of the staff as well. No DLP 3 or 4 participants at Jocelyn went on to occupy leadership positions, although several of them obtained their administrative credentials through the program.

Figures 20-22. Comparison of Three High Schools' Network Outcomes in 2010

**Figure 20
Jocelyn**
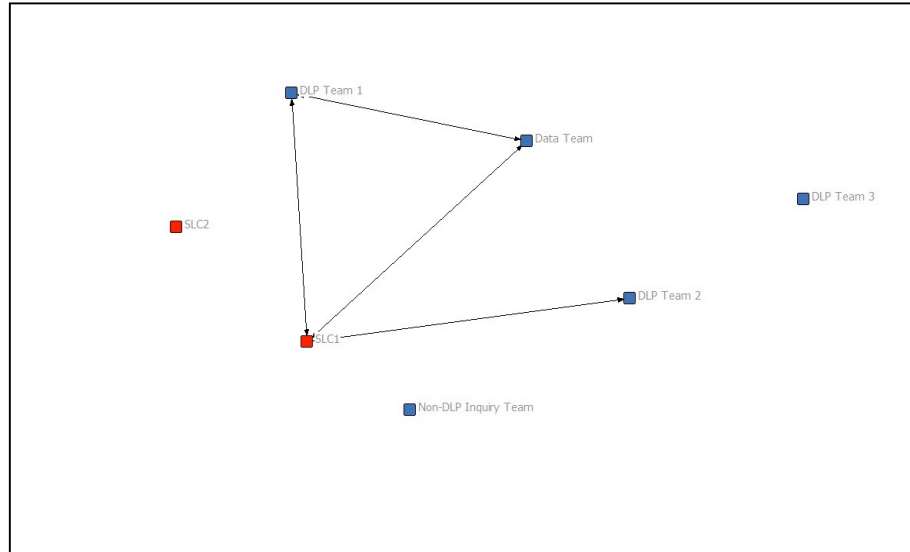
**Figure 21
Glades**
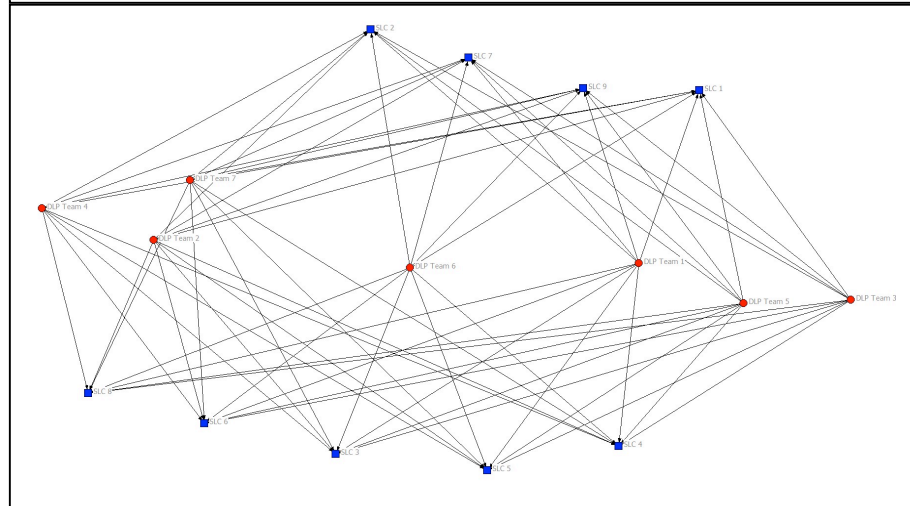
**Figure 22
Inverness**

In addition to network and connectivity growth, the schools also experienced shifts in culture around collective problem solving, belief in and reliance on data for instructional improvement, and evidence use to guide practice and thinking about student outcomes. Tables 20 and 21 show a comparison of Glades', Inverness', and Jocelyn's survey scale means and t-test results.
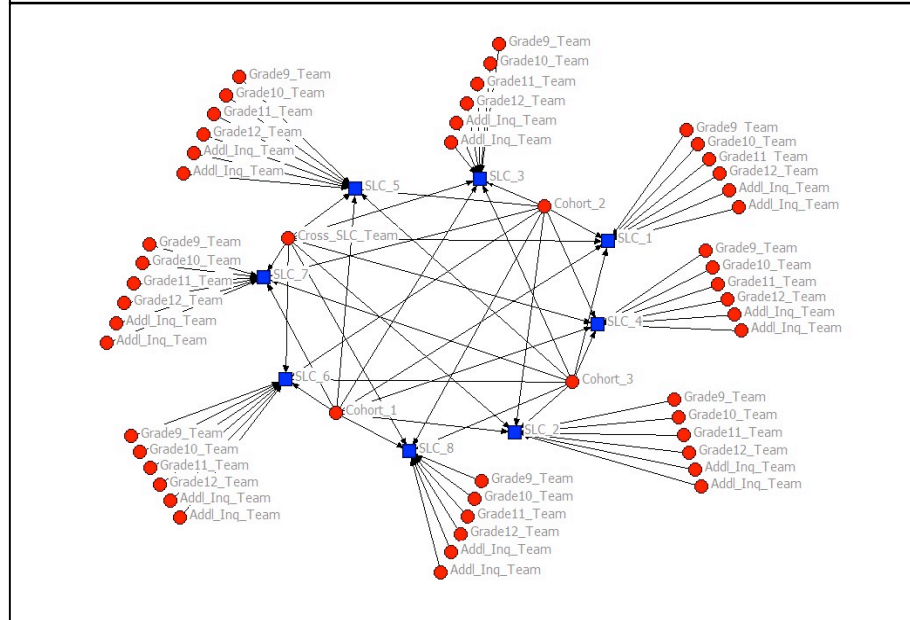
Table 20. Comparison of Three High Schools' Survey Scale Means

Outcome Measure	Jocelyn 2008 Mean	Glades 2008 Mean	Inverness 2008 Mean	Jocelyn 2010 Mean	Glades 2010 Mean	Inverness 2010 Mean
Supportive learning environment	3.07	3.06	3.24	3.01	3.29	3.35
Collaboration on problem solving	2.50	2.76	2.97	2.38	2.83	3.15
Trust and shared accountability	3.81	4.04	3.90	3.77	4.06	4.10
Collaboration on instruction	3.46	3.89	3.98	3.63	3.97	4.12
Collaboration on assessment	3.62	4.16	4.27	3.86	4.19	4.28
Leadership for professional community and network building	3.48	3.91	4.03	3.70	4.11	4.15
Leadership for data-based improvement	3.81	4.19	4.28	3.97	4.30	4.35
*p < 0.1, **p < 0.05, ***p < 0.01						

Table 21. Comparison of Three High Schools' T-Tests for Difference in 2008-2010 Means

Outcome Measure	Jocelyn Mean Diff T	Jocelyn P-value	Glades Mean Diff T	Glades P-value	Inverness Mean Diff T	Inverness P-value
Supportive learning environment	-0.65	0.26	2.68	***0.01	1.28	*0.09
Collaboration on problem solving	-1.06	*0.09	0.71	0.24	2.06	**0.02
Trust and shared accountability	-0.43	0.67	0.30	0.38	1.65	**0.05
Collaboration on instruction	1.52	*0.07	0.80	0.21	1.31	*0.09
Collaboration on assessment	2.06	**0.02	0.30	0.38	0.06	0.48
Leadership for professional community and network building	1.54	*0.06	1.72	**0.04	1.29	*0.09
Leadership for data-based improvement	1.56	*0.06	1.32	*0.09	0.94	0.18
*p < 0.1, **p < 0.05, ***p < 0.01						

T-tests detected significant positive changes for several average differences in salient inquiry work and spread measures at Glades, and almost all at Inverness. These findings triangulate with the schools' observed overall increase in network connectivity.

Jocelyn's movement on inquiry and network survey scales was more mixed, with some stagnation and negative changes, in addition to some increases. The two successful inquiry sites showed pronounced gains on supportive learning environment, compared to Jocelyn's decline on this metric. As already noted, collective problem solving underlies and is one of the main principles of DLP. In line with qualitative and network analytics, Glades and Inverness had growth in this area (with Inverness' being significant), while Jocelyn declined significantly. While Jocelyn declined (albeit not significantly) on trust and shared accountability, the other two sites grew. Interestingly enough, all sites showed some progress on leadership for professional community and network building, and for data-based improvement. As discussed in Chapters 4 and 5, an emerging hypothesis around these differences is that leadership varied across SLCs and influenced both SLC-specific and school-level results.

DLP at Three Large High Schools: Summary

Jocelyn, Glades, and Inverness were similar and different on their baseline inquiry environments. All three served largely minority and economically disadvantaged students; had a stable teaching staff and strong school leadership; and had at least some pockets of collaboration and support for experimenting with school improvement strategies. Glades and Jocelyn chose to implement the intensive version of DLP with a certification component that allowed graduates to credential themselves for administrative positions, while Inverness used intensive DLP without certification. Glades and Inverness had restructured into SLCs, moved DLP Cohort 1 and 2 graduates into positions as SLC leaders and APs prior to training the first large DLP Cohort (3), and had a relationship around previous reforms with DLP architects. Trained and expert

inquiry facilitators, who DLP participants lauded, worked with teams and school leaders at each site. All three principals were open to and eager to implement DLP as a school improvement strategy. Inverness' principal had a highly deliberate and strategic vision for rolling out DLP, which she engineered closely with her DLP facilitator. Glades' principal had a less clear vision but also well-developed goals and outcomes for DLP, and collaborated closely with his DLP facilitators to make these come to life. Jocelyn's principal was a more passive inquiry supporter, who did not collaborate closely or effectively with the site's facilitator. Jocelyn met with success around collaboration on assessments, one of the most challenging building blocks upon which inquiry is predicated. DLP 3 participants faced challenges when they attempted to grow their inquiry work, without the strong support of a DLP facilitator-principal alliance, and confronted with a resistance to change at the site. At Glades restructuring to SLCs and distributing leadership broadly to build community proved to be crucial to expanding inquiry. At Inverness, a highly strategized school-wide inquiry roll-out by the principal and DLP facilitator focused on infusing inquiry habits into staff practice.

The case studies of Jocelyn, Glades, and Inverness illustrated stand-alone stories of inquiry trajectory and network-building at three large comprehensive high schools. This cross-case analysis points to conditions that made a difference in implementing inquiry-based reform through DLP, a model that is well-grounded in evidence on the problems of school change. The relationships that DLP teachers, facilitators, and administrators formed around inquiry influenced how teams deepened and grew work. Lessons learned from Glades', Inverness', and Jocelyn's experiences can inform other large high schools' efforts to develop cultures of evidence-based practices and beliefs.

CHAPTER 8: CONCLUSION

Implications and Significance

Data-based approaches to school improvement are in high demand and rely on teams to enact and spread inquiry with outside support. One of the primary difficulties in implementing these data reforms is affecting teachers' commitment to innovation and their capacity to recruit colleagues to take on evidence-based practices (Honig, 2008). Building positive social capital and networked communities of practice around inquiry is a major concern for administrators and policymakers alike (Coburn, 2006). A network of practitioners with broadly distributed leadership can ensure that evidence-based practices have "sticking" power among staff, become part of school culture and routines, and have peer assistance and support (Knapp, 2008).

Research has affirmed that facilitator support is critical for the work of inquiry teams to be successful (Gallimore et al., 2009). What this dissertation discovered reinforces this finding and extends promising insights into how facilitator-team-administrator relationships shape the growth of inquiry networks and social capital in schools, under different context conditions and at distinct developmental stages. Research that sheds light on how relational processes and outside trainers drive collaborative inquiry is key to developing an understanding of how to build inquiry networks in schools. This dissertation showed how expert facilitators influenced collaborative inquiry under three different models for large school reform: Small Learning Communities coupled with traditional department structures (Glades); SLCs that absorbed departments (Inverness); and traditional departments (Jocelyn). The following question drove analyses:

1) How do school inquiry readiness, inquiry team composition and dynamics, and facilitator-administrator collaboration influence the adoption and spread of inquiry practices and beliefs over time?

   a. How do expert outside facilitators work with site administrators around inquiry?

   b. How do facilitators work with teams and school staff to support inquiry progress as different developmental stages of inquiry?

Team Composition and Dynamics

Homophily in social networks, or the principle that "similarity breeds connection," has been found to structure work relationships of every kind (McPherson, Smith-Lovin, & Cook, 2001). Some studies suggest that selecting teams homogeneous with respect to grade level or content area brings about a greater commitment to and spread of school reforms (Bryk, Camburn, & Louis, 1999). Others have found that homophily can in fact serve as a barrier to diffusion, by making it difficult for innovations to arrive from outside tightly connected communities (Easley & Kleinberg, 2010).

This dissertation lends credence and support to the theory that greater heterogeneity in organizational units represented and practices undertaken, is preferable to more homogeneous inquiry teams. Facilitators and school leaders can be strategic and avoid haphazard team selection. They can leverage team composition to increase the likelihood of success at accessing target students, testing out and assessing interventions, and creating connections with colleagues around analyses, interventions, and inquiry buy-in. First, trainers and administrators can build teams that are as diverse as possible along

the dimensions of content and teaching experience. At all three schools, teams that were more heterogeneous with respect to subject areas taught and years of experience generally fared better than those that were less diverse. These teams were more likely to directly implement the instructional interventions they designed in their own classrooms, rather than tracking target students down through colleagues to implement interventions. They moved through inquiry cycles more quickly and easily than their homogeneous counterparts. Diverse teams are more agile with respect to having the content area expertise to design and evaluate instructional responses in a broader area of subjects, and thus better able to address whatever learning targets students' data suggests are most important. Finally and most important to spreading inquiry, mixed teams had access to and relationships with a more cross-sectional population of students and colleagues, through SLC and departmental membership. These teams were able to grow more densely-connected networks around inquiry that spanned various organizational units.

Teams at the three schools were able to achieve moderate to high degrees of bonding capital. As communities of practice they problem-solved to gain "closure" as a dense local network. As the literature suggests, if and as team members interact with outside supports and colleagues around inquiry, then through this bridging capital, the team can profoundly change the very context within which it operates. At Inverness, teams continued to bridge practice outwards to a network, which continuously increased on levels of social capital and valuing inquiry as a way of doing things. Glades also made progress in extending inquiry practice beyond the explicit structures of SLCs to incorporate colleagues who taught the same subjects or collaborated through grade levels. At Jocelyn, teams attempted to bridge out to a network of practice, and their relative

differences from the other two schools in this represent a different developmental stage in the inquiry process.

Team Norms. Two practices were particularly helpful in developing not only DLP teams' inquiry, but also individual members' inquiry skills. Teams that established or lobbied for inquiry-specific common planning time during the school day, reported accomplishing more tasks and doing this at a faster pace than those who did not. Teams without common planning time struggled to get their inquiry processes of data analysis, identifying target groups, and putting on staff-wide professional development off the ground. Teams who moved from no common planning time to having this built into their work days reported a marked improvement in pace of work and quality of analyses and assignments.

A second key norm that made a difference for inquiry teams was the rotation of roles and responsibilities among team members. DLP participants who worked on teams that did not engage in this practice consistently reported less progress. Although it sometimes took them as individuals less time to complete their contributions to group assignments, they did not step outside their comfort zones to increase their analysis, management, and assessment skills. Teams that pushed members to take on different inquiry roles reported that participants expanded their skillset and grew more comfortable with leading inquiry. Responsibility for ensuring these practices rested primarily with facilitators. Trainers' ability to deliver on these, however, was also predicated upon their own relationships and positive social capital with site administrators.

Taking on New Roles. Collaborative inquiry develops teachers' professional identities as researchers, analysts, and leaders of change. Research in social psychology

and organizational behavior has extensively examined how identity development influences professionals' behavior (Ashforth & Humphrey, 1993; Pratt, Rockmann, & Kaufmann, 2006). When implemented successfully, as at Glades and Inverness, inquiry facilitated professional shifts in teachers' roles, practices, and self-conceptions as leaders and analysts. Districts and policies demand that teachers adopt new roles, like change agents and data-driven decision makers, at a faster rate than teacher preparation programs can keep up. Given this landscape, developing an understanding of how outside factors can facilitate the adoption of these new practices and roles, is now more urgent than ever.

One of the goals of inquiry-based reform is to develop leadership and practice around inquiry work. This shift presses teachers to "interpret who they are" through a situative and iterative process, comprised of role transitions and changes in one's self-definition (Burke, 2004). As decades of unsuccessful school reform efforts testify, enacting new practices does not necessarily lead to teachers adopting new roles (Tyack & Cuban, 1995). Changes in practice have to intertwine with related and accompanying shifts in teachers' self-definition in order to have any chance at permanence (Grossman, Hammerness, & McDonald, 2009). Teachers participating in inquiry at Glades and Inverness shaped their work into a fertile context for meaning and growth. With push from facilitators, teachers reported changing their practices to be more reflective, differentiate instruction to a greater degree, elicit student responses in ways that debunk previous assumptions about student knowledge, and gauge student knowledge through tools grounded in specific classroom settings.

Having the structures and legitimizing voices in place for inquiry spread is highly dependent upon a strategic and collaborative vision by principals and facilitators.

Building a dense and expanding network of inquiry practitioners, however, is not a top down initiative. The process begins with buy-in from the principal of inquiry as a school-wide improvement strategy, followed by the crafting of a strategic plan and vision with the DLP facilitator. Subsequent stages of development of social capital and a dense network include distributing leadership and sharing of the training floor (with principals modeling leadership skills and making explicit links to site-specific issues, and DLP facilitators in charge of inquiry pieces and consistent pushing of teams to go small for big changes). Inquiry requires buy-in by school leaders first, but is fundamentally an initiative that requires grass-roots distribution of responsibilities for students' success and experiential use of inquiry to get there.

DLP Facilitators and Teams

Meaningful and long-lasting changes in practice demand a great deal of effective professional training (Ball & Cohen, 1999; Wilson & Berne, 1999). Inquiry that deeply transforms leadership and practice requires experienced mentors with the capacity to guide shifts in teachers' practice, routines, and self-definition (Talbert, Scharff, & Lin, 2008). Effective facilitators also provide different levels and types of support to schools at different moments in teams' and sites' developmental stages of inquiry. This dissertation adds an understanding of how facilitators worked with teams to elicit these shifts, what school operational features made the structuring of these relationships possible, and what facilitator characteristics were most important for helping teams build inquiry networks and social capital at their schools.

Broad claims suggest that frequency and duration of interaction are key to building successful professional relationships (Marsden & Campbell, 1984; Portes,

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1998). Specifically, however, facilitators tended to have more success in training teams on inquiry when they spent at least two days a week at school sites. This amount of interaction provided a tipping point at which facilitators not only armed themselves with an understanding of their site's personnel, culture, and systems, but also became accepted as insiders to the school and grew to occupy more embedded positions with the staff. DLP facilitators hold an increasingly common position as expert outsiders, whose role requires that they quickly get up to speed with the idiosyncracies of their school(s). Similarly positioned outside trainers who wish to be effective at developing their teams' strengths would want to tow the line of critical friend and strategic ally. Facilitators met with the greatest success when they: spent at least two days at sites; developed an intimate understanding of their school's workings and culture; and maintained a critical friend stance while pushing DLP participants to go and stay small for big improvements.

Being a strong facilitator alone was not enough to forge an effective partnership with DLP participants. Facilitators at all three sites received training from DLP architects and praise for their facilitation skills and inquiry knowledge from school staff and leaders. Glades and Inverness facilitators, who were able to move participants to conduct inquiry and spread it to a network of colleagues, gained an intimate understanding of the school's routines. By contrast, Jocelyn's facilitator did not. Having a DLP facilitator that bridged outside inquiry expertise with customized application to a specific setting, staff, and students was key to building a community of practitioners. Initially, Glades' and Inverness' facilitators became accepted insiders and embedded participants, respectively. Over time Glades' facilitator stepped back to allow her co-facilitator who was an AP to co-lead and develop capacity amongst his colleagues to lead other staff in inquiry. At

Inverness, the DLP facilitator worked with successive DLP cohorts to develop a peer mentoring and training model, which within a few cohorts resulted in staff pushing inquiry forward without the need for additional outside expertise. DLP depended on facilitators who could weave themselves into but not lose perspective on the life of the school. In Jocelyn case the DLP facilitator attempted to weave herself more into the school's social fabric in her second year, but the opportunity to leverage embeddedness early on appeared to have passed.

What made a difference for facilitator effectiveness was recruiting individuals with K-12 site administrator experience. These facilitators were comfortable pushing principals to stay small with inquiry, share the floor with them at trainings, and let them take on an expert role in the eyes of staff with respect to inquiry. Key to being able to carry out a role as an expert outsider entering a school site is the ability to manage interpersonal relationships with principals, without creating a threat or misaligning expectations. It is also important for facilitators to be flexible in their scheduling and to spend more than mandated time at their sites, as they are needed outside the boundaries of a typical school day.

Since inquiry models are so experiential in nature, it is not as important for facilitators to have inquiry experience coming into leading inquiry, as it is to have ongoing training and their own professional network of practitioners. As this community of learners went through the shared ordeal of supporting teams in implementing inquiry at their sites, they leaned on each other extensively to troubleshoot and engage in their own collective problem solving efforts.

Schools need different types and levels of support from their DLP facilitators at

distinct developmental stages of inquiry. Being or becoming an insider as a facilitator is important at the beginning stages of inquiry. This level of intimate knowledge is necessary to understand the systems, relationships, and organizing structures (SLCs or departments, for example) through which inquiry can travel and which can be leveraged to build social capital. It is key for facilitators to hit the ground running with respect to becoming embedded in this sense; without initial momentum it is difficult to turn the ship around. Once facilitators do gain and leverage this knowledge to support their inquiry teams in tapping the organizational units and relationships that will yield network density and inquiry capital, teams are typically developmentally advanced enough that facilitators and teams can train successive cohorts of staff in inquiry, without an embedded outsider being necessary.

DLP Facilitators and Principals.

Various studies point to the importance of administrative buy-in for school reforms to be successful (DuFour & Marzano, 2009). DLP extends this threshold of legitimization higher, in that it explicitly asks principals to mentor inquiry teachers to become leaders and administrators. Implicit in this process is that DLP facilitators and principals had to share the training floor and mentoring responsibilities. DLP facilitators not only had to tow a fine line in building relationships with DLP participants, they also worked to collaborate strategically with principals. Glades and Inverness installed inquiry as a school-wide practice and built highly connected networks around it. This was due in large part to principals and DLP facilitators communicating frequently, co-planning at least parts of DLP trainings, delineating one another's roles and responsibilities to DLP participants, and establishing and continually refining a common vision and goals for

inquiry at the schools. Jocelyn's principal and DLP facilitator did not establish two-way communication, clarity in role division, or a joint vision for DLP's implementation and spread at the site. As a result, the program plateaued early on with respect to percent of staff involved and cross-collaboration among different inquiry teams. It is vital that DLP facilitators and principals maintain clear and frequent communication around DLP vision, training content, and how they share stage time at seminars. An explicit delineation of roles among DLP facilitators and all school leaders clears a path for DLP facilitators to create relationships with teachers and to keep participants' focus on inquiry rather than competing school priorities.

As much of the literature on school reform indicates, school staff typically cannot conduct business as usual if they are trying to spread a new reform. This is particularly true with building a network and social capital around inquiry, which requires opening up new pathways and opportunities for relationships to grow around evidence-based practices. All three principals created dynamic structural units so that new alliances could form around DLP. In the case of Inverness, this took on the form of SLCs that absorbed content-area departments, and infused inquiry throughout grade level teams and other informal cross-functional units. Glades had a hybrid matrix organization of these two structural units, and leveraged them to build up a community of inquiry practice. At Jocelyn, the two SLCs established contributed to DLP teams' traction around collaboration on assessment. Glades and Inverness may have taken restructuring a step further developmentally and scaled it school-wide, but all three schools attempted to re-organize into new incubating units for inquiry successfully.

Additional Data Support Roles

Data support can streamline inquiry adoption and internalization of an evidence-driven mindset among teachers, through timely data access, opportunities for data exploration, and data specialists (Barber & Mourshed, 2007; Supovitz, Mayer, & Kahle, 2000). These three resources support data collection, analysis, and interpretation and facilitate diffusion of inquiry among faculty (Kerr et al., 2006; Wayman, & Stringfield, 2006). As inquiry networks grew at Glades and Inverness, staff and leaders identified the need for cross-functional data supports to accommodate the increased need for timely data analysis that spanned multiple organizational units. At Glades the principal dedicated a full time staff member to work as a data specialist for the entire school. This investment of time and resources had a big payoff. Staff and inquiry teams came to depend on and collaborate with "Darth Data" (as he was affectionately called) on inquiry questions that traversed content areas and SLCs. At Inverness the need for a cross-SLC data team bubbled up directly from teachers. Staff noted that although within-SLC inquiry was functioning well, there was an increasing number of analyses that required cross-SLC collaboration and dissemination of findings. The cross-SLC data team emerged as an effective response to these needs and still operates at the school. Jocelyn's principal attempted to institute a similar support, through a non-DLP cross-departmental data team. However, the school did not yet have the inquiry network to support this broad type of cross-unit collaboration. As a result, staff did not demand the team's work and the team conducted very little cross-departmental inquiry. As the number of incubating units for inquiry and inquiry connectivity increase at a school, staff and leaders can consider ways to coordinate and share inquiry work.

Summary and Conclusions

Professional relationships are foundational for expanding inquiry and other challenging innovations in schools. Interactions among outside experts, teaching staff, and school leaders are not only vital for information flow, but also for structuring teachers' evidence-based practices and conceptions about themselves as agents of change. This dissertation shows that it is not enough to have only one type of positive relationship, in order to implement inquiry and use it to ground a network of practice. For instance, having an effective facilitator is futile without a supporting and legitimizing principal who distributes leadership and embraces inquiry as a school improvement strategy. Having a principal with a strong vision and support for inquiry, but weak teams that do not move the work to colleagues also stifles growth. Conducting and spreading inquiry is predicated upon how facilitators, principals, and teams all work together, and how they can work and leverage their connections to grow inquiry at the school. There are many ways in which expanding inquiry, moving from the team to the school level, can fail. There is primarily one, however, a robust and integrated effort predicated upon relational dynamics among trainers, teachers, and principal, to ensure that inquiry works and spreads.

Research, policy, and practitioner views of teaching have evolved over the last several decades to a focus on teachers as active decision-makers and reflective practitioners (Grossman et al., 2009). At the same time, the standards movement and efforts to increase the professionalization of teaching call for a greater commitment to teacher learning than ever before (Wilson & Berne, 1999). If new assessments and standards require innovation in teaching in order to move students, then teachers require

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new forms of inquiry and data training as well. Inquiry, however, seldom succeeds by virtue of mandate. Programmatic supports and school conditions matter, as does conceptualizing inquiry as a transformative reform rather than simply a new set of skills. Simply arming teachers with skills does not necessarily impact their core beliefs. If change is to be sustained, it requires more than behavioral modifications alone, what one does, but rather who one is as an educator.

The U.S. lacks a unified continuous learning framework for educators' professional growth. Consequently, teachers are forced to actively interpret and make sense of training intended to bring about change in their practice. This context grants teachers an enormous amount of discretion when it comes to implementing inquiry reform. Many teachers, recognizing the fleeting nature of many reform initiatives, refuse to engage. Teachers' conceptions of evidence use likely influence how districts respond to policy demands for data inquiry (Coburn & Talbert, 2006). Ultimately, teacher development "should be organized around a core set of practices in which knowledge, skill, and professional identity are developed in the process of learning to practice during professional education" (Grossman et al., 2009, p. 274). Since schools often suffer limited budgets and intense accountability pressures, programs and theories of action and learning that develop endogenous resources – teachers – are pertinent and valuable.

Limitations and Directions for Future Research

Follow-up interviews at the end of the study revealed that Inverness, now completely saturated with inquiry teams across organizational units, had set an ambitious new goal: inquiry of one. Having scaled out and learned inquiry collaboratively and in teams, teachers would treat their classrooms as the full set of students whose skill levels they would try to improve. The idea behind this plan is that every teacher would examine their own data and design instructional interventions appropriate to their students. In some ways this model of inquiry is a logical extension of DLP at a school site that had built a dense and cross-cutting network of practice and peer support around inquiry. At the same time, this inquiry team of one represents a radical departure from one of the key design principles of DLP, that it is in fact *collaborative* inquiry, predicated upon a community of learners. Research is needed to understand how this at once evolutionary and simultaneously distinct model of inquiry will work, in particular in comparison to the original DLP. As autonomy is still rampant in teaching, how would attempting to conduct one's own classroom inquiry leverage facilitation and relational supports from colleagues and administrators? What would a DLP classroom look like? How would teachers collect real-time assessment data around their students' learning targets? How could teachers provide ongoing facilitation for each other? How would teachers new to the school be inducted to this untraditional way of conducting practice?

Differences in SLC survey trends at Glades and Inverness pointed to variation in quality of leadership for collaboration for problem solving and data-based improvement. Additional research is needed, however, to explore what precisely accounts for these differences. Are these cross-SLC differences due to initial strategic choices (or lack there

of) by facilitators and principals about restructuring and who should lead the SLC? Are they due to loose coupling between DLP training received and its implementation by program graduates in their communities? Do micro-processes of sense-making and experiential learning account for observed variation in outcomes?

The three sites in this study present different primary transmission mechanisms of knowledge around inquiry: DLP facilitators and principal at Glades; DLP facilitator and cohort to cohort at Inverness; and DLP facilitator alone at Jocelyn. An important line of analysis to pursue further is what types and conduits of knowledge transfer are most effective at ensuring inquiry sustainability? Are outside experts, on-site leaders, and peers competing sources of knowledge that produce different levels of buy-in and interest in changing practice?

Although this study does not make causal claims, it suggests promising lines for conducting experimental or quasi-experimental studies on how teams develop networked PLCs. An experiment that would allow one to make causal claims about inquiry would entail the random assignment of teachers and/or schools to participate in inquiry or not. There are two main challenges to obtaining causal estimates of peer effects. First, there is self-selection, which occurs when study participants (teachers) seek out or are assigned to certain peers (inquiry teams) because of their potential outcomes. The teachers' final outcome will appear to be caused by the assignment to peers, when the causality is the other way around. A second problem is reflection, where if a peer influences a teacher, that teacher also influences the peer (Manski, 1993). For example, a teacher who has high leadership potential and observable inquiry habits of mind may work with teachers who exhibit less of these qualities, and then the first teacher would positively impact ("raise")

the inquiry commitment level of his or her team, on observable measures. Looking at final outcomes then, the first teacher will appear to have peers who are committed to inquiry and all teachers will appear to be "high achieving" on these metrics, but it will not be possible to identify the original teacher who caused the change. This is problematic for obtaining causal estimates because it means that treatment assignment (assignment to a peer group) is not ignorable. If teachers influence peers' achievement, then the measure of treatment condition is affected by the teacher's own initial achievement level, meaning that teachers who are "higher" and "lower" achieving are not equally likely to get the same kind of peers. One way in which scholars have attempted to address the selection bias issue has been through using fixed effects and instrumental variables to address reflection, and these empirical strategies could serve as a starting point for peer influence inquiry studies in the future.

This dissertation makes clear that school reform is not about the effects of random initiatives on the average staff member. Rather, reforms entail being strategic in selecting and building teacher leadership for inquiry-based change. Social capital, PLCs, and broader networks are vehicles of change for capacity-building reforms, that rely on relationships to transmit learning, buy-in, and practice. This way of thinking is in stark contrast to ideas about treatments that randomly assign teachers to something that works outside the social fabric and operates solely to build or measure individual skills. Districts make substantial and increasing investments in data-based initiatives and training and support around these innovations. This dissertation leads to an improved understanding of the professional relationships and supports that help teachers succeed in the challenging process of using data to help students garner the necessary skills to move ahead.

#	Source Name	Conceptual Bin	Study Questions /Purpose	Sample/Design	Independent Variables	Dependent Variables
1	Achinstein_2002_Community, diversity, and conflict among schoolteachers The ties that blind	PLCs	To examine the school reform lit on the desirability of school community building. Describe two case studies of different teacher professional communities in action over time. Point out positive and negative potentials of community and conflict in achieving desirable educational results.	Two Chicago public schools: one was a middle school	Teacher community (professional communities); teacher conflict	Educational outcomes for students; collaborative outcomes for teachers: 1) as occupational communities, teacher PLCs are engaged in common work, and involve a group of people across a school whose identity is drawn from their common work as teachers
2	AGI_2009_How High Schools Become Exemplary	Leadership	To explore the ways that leadership raises achievement and narrows gaps by improving instruction in public high schools	15 public high schools from MA, IL, OH, MD, TX, & DC previously identified by AGI for having unusually strong evidence of student learning as measured by gains on standardized state exams	Leadership teams' practices	Student achievement
...	...	...	...	...	...	...
188	Yasumoto (& Uekawa & Bidwell)_2001_The Collegial Focus & HS Students Achievement	Collegial focus, student achievement	The authors examine the consequences of teachers' collegial social relations for high school students' mathematics and science achievement	52 public high schools and 3,000 students	Teachers' collegial social relations	High school students' mathematics and science achievement
190	Young_2006_Teachers' Use of Data: Loose Coupling, Agenda Setting, and Team Norms	Data use	What factors within a school influence teachers' data use?	Embedded-systems perspective	Grade-level team norms and district and school leadership	Teachers' data use

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[46] Salient literatures that inform the conceptual framework are: 1) situative perspective; 2) groups and teams; 3) networks; 4) social capital; and 5) professional learning communities. I had extant familiarity with the topic's literature base, due to four years of inquiry research experience. I supplemented my existing database of relevant studies with searches on ERIC, JSTOR, Google Scholar, and PubMed, using the following parameters: 1) focus on 1990 to present; 2) fields of education, sociology, organization studies, and medicine (with specific focus on inquiry and application of network, PLC, and social capital frameworks); 3) search terms: data inquiry, network, teams, teacher practices, facilitators, teacher beliefs, evidence use, diffusion, spread, PLCs, and social capital. Of 254 studies that met search parameters, I discarded 64 whose scope was outside the research topic, and coded the remaining 190 publications in a matrix that culled information on the type of publication (e.g., journal article), conceptual bin (e.g., collegial focus), study purpose, sample/design, independent and dependent variables, type of analysis, findings, and limitations.

Analysis	Findings/Claims/Conclusions About My Constructs	Limitations	Implications
Lit review; school case studies (2)	Communitarian theory. How discussion of community often moves from "ties that bind" to those that "blind," ignoring differences and the role of conflict. Overly harmonious models of community within the literature often leave practitioners confused...	Small n	Examine the kinds of communities we want to build in schools that reflect democratic goals.
Regression; qualitative	Student achievement rose when leadership teams focused thoughtfully and relentlessly on improving the quality of instruction. Core groups of leaders took public responsibility for leading the charge to raise achievement.	na	Teachers undertook the following steps: 1) Accepted responsibility to lead change process; 2) Declared purposes of the work in mission statements; 3) Designed strategies, plans, capacity, and incentives for broadly inclusive adult learning; 4) Developed and refined quality standards for judging teacher and student work; 5) Implemented plans, monitored quality, and provided appropriate supports and incentives.
...	...	...	...
Growth model for achievement incorporating student, teacher classroom & department effects. Attention given to mechanisms of collegial social control.	When departmental faculties form collegial foci -that is, when they present a combination of communication density, intensity of instructional practice norms, and consistency of practice-the effects of their instructional practices on students' achievemen	na	na
Qualitative: takes the practitioners' perspective on what constitutes data.	Establishing rationale for teachers to use particular data, modeling such use, and structuring time for teachers to learn about using data are deliberate agenda-setting activities. Varying degrees of loose coupling between the case study districts	Time span	na

APPENDIX B: TYPES OF DATA COLLECTED

Semi-structured Interviews

Repeated semi-structured interviews yield a cross-sectional and longitudinal picture of the meaning that teams ascribed to the inquiry process and of the evolution of their practices and beliefs as they implemented the reform (for a sample "composite" inquiry participant interview protocol, see Appendix C). Questions focused on five broad relevant themes: 1) participants' background and motivation to join DLP; 2) experience in the program: trajectory, relationships, successes, and challenges; 3) team functioning and development; 4) perceptions around network and school culture changes; and 5) resources and supports that influenced depth of inquiry practice and beliefs. Triangulating research strategies to investigate the same empirical units increases the likelihood of obtaining accurate and unbiased observations regarding the phenomenon at stake (Seidman, 2006). Interviews were triangulated both internally, as we asked informants about relationships and depth of inquiry work at several points in several distinct ways during each interview, and across interviews, as we asked non-team informants the same set of questions about the inquiry teams.

Interviews took place in enclosed spaces, like classrooms or offices, in order to ensure privacy, and at the beginning of the school year before teams began inquiry, to provide a baseline. Interviews were repeated once or twice during each school year that teams participated in DLP, culminating in an "exit interview" where teachers were asked to reflect upon their inquiry experience as a whole and on their plans and aspirations. Interviews also elicited information about school setting and team characteristics. Interviews were professionally transcribed and stored on a database, accessible only to

researchers on the team who applied for and received the necessary permissions. One

disadvantage of using interviews to gather information about team experiences is that

these illuminate self-reported understanding rather than providing the opportunity to

observe direct group interaction. At the same time, the personal setting of the interviews

minimizes any risks that teachers might feel in speaking out about negative aspects of

inquiry work in front of their team members or administrators. Focus groups and seminar

and inter-visitation observations supplemented data collection at the group level.

Focus Groups

Group interviews provide an alternative way to individual ones for assessing joint

sense-making and behavior, and are particularly useful and necessary when attempting to

understand team and group-based processes (Emerson, 2001). Focus groups took place at

least once a year with each DLP team, either in lieu of or in addition to interviews with

individual team members. Questions focused on the same five general themes as

interviews, but with an emphasis on team functioning and development over time. Focus

groups also took place in private spaces on school grounds, with principals' permission,

and were recorded and professionally transcribed. Since group dynamics might prevent

individuals from speaking frankly about team functioning in front of colleagues, these

focus groups supplemented rather than replaced individual interviews.

Seminar Observations

One disadvantage of interviews and focus groups is that they provide self-

reported information (Weiss, 1994). Additional interviews were conducted with

administrators and inquiry facilitators, who provided independent observations of teams'

behaviors and conceptions. In addition, seminar observations provide direct

documentation of teams' joint learning process and interaction around inquiry. At least one seminar observation took place in each school annually, in conjunction with at least one interview or focus group, in order to allow for triangulation and no lag time between observed events.

Observations of Team Visitations

DLP teams from different schools conducted inter-visitations, in order to exchange inquiry ideas and practices. Observing these provided insight as to how teams built professional relationships not only within schools with their own colleagues, but also across schools. Inter-visitation observations took place in conjunction with at least one interview or focus group, to allow for triangulation and no lag time between observed events. These observations yield information about team characteristics and observed indicators of changes in teachers' practice and beliefs surrounding inquiry.

Surveys

Survey data permit an examination of variables more broadly, allowing for cross-site comparison and generalization. A baseline and two follow up surveys of inquiry team members in all schools and of all staff in focal schools, took place in the spring of 2008, 2009, and 2010. Surveys were administered through a combination of hard copy and online forms, based on principals' preferences. Participants were asked to budget about half an hour in order to complete a series of Likert scale and open-ended questions that covered four main areas: 1) school conditions; 2) professional development and instruction; 3) background and career in education; and 4) leadership aspirations. Inquiry team members, in addition to completing these questions, also answered questions about the following: 5) the inquiry team's work in the school; 6) type and extent of inquiry

supports received; 7) leadership development supports; and 8) experience with involvement in intensive DLP version, when applicable.

Learning Artifacts and Work Products

Learning artifacts include communication exchanges among DLP facilitators, which illuminate an additional important perspective of how facilitators experience their relationships with each another, teams, and school staff. Work products consist of inquiry presentations, assessments, student work analysis, inquiry cycles, and other deliverables that DLP teams generated throughout the school year. Although these do not yield first-hand reports or observations, they nonetheless provide an important source of information about the depth of teams' thinking and practice around inquiry.

SEMI-STRUCTURED INTERVIEW PROTOCOL (NON FIRST-ROUND
INTERVIEWS)[47]

Framing (post introductions and identifying self as Stanford researcher): I am trying to

capture themes in DLP team members' experiences with the inquiry and leadership

model of school reform. I want to emphasize that this interview is confidential (hand

confidentiality sheet to informant and explain that it assures him/her of confidentiality

and is both a district and Stanford requirement). None of your comments will be

identified with you in conversation or in print. I would like to tape the interview to ensure

quality and thoroughness. Is this okay with you? (If informant agrees, then offer to

provide a transcript if they are interested; if not, do not record and ask if it's okay to take

notes).

Relevant Themes:

- Background and motivation to join DLP

- Experience in the program: relationships, successes, challenges, trajectory, and

  supports

- Team functioning and development

- Perceptions around larger changes: network and school culture

- Resources and supports that made a difference for inquiry work and spread

Interview Questions:

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[47] This "composite" protocol presents key questions repeated during various rounds of interviewing. The protocol was jointly designed and iterated by the research team, as we fine-tuned research questions over time. The protocol was also customized with additional site-specific probes. As we already had entree, good rapport, and baseline interviews with informants, this protocol excludes questions eliciting background information, like participants' school role or tenure. Interviewers selected which questions to ask depending on amount of time available with each interviewee, but always included at least one question that addressed each of the broader relevant themes described. As the protocol is a semi-structured one, interviewers used the questions applicable to the interviewee and school, based on research and joint conferral before site visits.

1. What prompted you to join DLP? (Follow up: who influenced your decision, e.g. colleagues, principal; probe for any organizational links between informant and these individuals, like content area, grade level taught, friends, etc.)

2. What were your expectations of the program when you started? Why? Based on what?

3. How would you describe DLP to someone who is not familiar with the program? Is the program different from what you expected? If so, how? If not, how does it align with your original expectations?

4. Please bring me up to date on your inquiry work this year. (Follow up: target group of students, learning target, sub-skills, DLP assignments, seminars with colleagues, facilitators, principal involvement, etc.).

5. Tell me about your DLP team. (Follow up: members, content areas, how they work together, who they interact with externally, e.g., principal, facilitator.)

6. I want to capture the learning process and struggles that you experienced as part of a team in DLP – and would like you to reflect on your experiences since you started.

   a. Where do you think your team's greatest progress has been since school started? (Follow-up: What were these changes? Any big transitions? Please describe. How did these come about?)
   b. What's been your greatest challenge this year? How have you addressed this?
   c. What resources have made the most substantial difference in moving forward and dealing with challenges? (Follow up: ask for specifics and how these made a difference; facilitator, readings, assignments, tools, feedback, administrators, data specialist, the team itself, school culture?)

7. Now think about how if at all you as an individual changed in your thinking about teaching or your practice/role as a teacher. Also consider any changes that you have noticed in school culture and spread of inquiry over time.

   a. Is there any kind of change in one's thinking or practice that accompanies inquiry work? (Key probes: assumptions about students, student learning/focus, perceptions of data, role as a leader in the school; per classroom instruction: focus on individual students, assessment use, instructional responses, etc.).
   b. What about changes in your students? (Key probes: sharing data with students, student ownership over success, etc.)
   c. What about changes in the school and/or your colleagues? What if any norms or systems have changed or are you working to change? Do you

think your colleagues have been influenced in any way by your DLP team efforts? (Follow up: coaching, resistance, legitimization of DLP, word of mouth, colleague recruitment, etc.?) Have there been any decisions made to change policy or practice in the school (or SLC/department)? Do you see a network developing around inquiry, in your school or through your interactions with practitioners outside your building?

8.   Finally, I am interested in what your experience has been with the district in general. Besides your DLP instructor, has your team interacted with or received any other support from your district central office? What kinds of additional supports might you need?

Thank you very much! I really appreciate your sharing your time and thoughts with me – both are very valuable. If you think of anything else, please don't hesitate to get in touch with me at any time. I look forward to talking again in ___ (spring/month/several weeks/etc.)

APPENDIX D: SURVEY SCALES

The Center for Research on the Context of Teaching (CRC) at Stanford University

developed these survey scales using data from the 2008 and 2009 Inquiry Team Survey

and 2010 Teacher Survey for New Visions Evaluation, a web-based survey of IT

members or a selection of teachers who were involved in inquiry in all public schools in

New Visions in New York City. Principal components analysis was used to identify

survey items that load on a common factor. Alpha coefficients indicate the internal

consistency of a scale. Survey items that make up each scale used four- or five-point

Likert scales from 1 ("Strongly Disagree") to 4 or 5, depending on the scale ("Strongly

Agree"). Scale scores equally weigh component items and are reported as means (1-4 or

1-5) (CRC, 2010).

1) Supportive School Environment (7 items in 2008, 6 in 2009, and 5 in 2010. Alpha =
0.83)
- 4-point Likert scale, ranging from 1 ("Strongly Disagree") to 4 ("Strongly
  Agree")

*Please indicate how much you agree or disagree with each of the following statements
about working conditions in your school.*
- This school has a clear vision of reform that is linked to standards for student
  learning and growth
- There is a great deal of cooperative effort among the staff members
- The school administration's behavior toward the staff is supportive and
  encouraging
- The principal talks with me frequently about my instructional practices
- I am supported by school leaders in efforts to improve instruction for my students
- I receive ongoing feedback and evaluation useful for improving my instruction
- This school has a clear vision of reform that features the use of data on student
  performance to focus improvement efforts

2) Collective Problem Solving (2 items. Alpha = 0.75)
- 4-point Likert scale, ranging from 1 ("Strongly Disagree") to 4 ("Strongly
  Agree")

Please indicate how much you agree or disagree with each of the following statements about working conditions in your school.

- Teachers take an active role in school wide decision making
- The faculty has an effective process for making group decisions and solving problems

3) Trust and Shared Accountability (7 items. Alpha = 0.90)
- 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree")

How well does each of the following statements describe the teaching culture of your school or SLC ("Small Learning Community" if you teach in a large high school divided into SLCs)?
- Teachers trust one another
- Teachers share a vision of good teaching
- Teachers feel responsible to help one another do their best
- Teachers use time together to discuss teaching and learning
- I make a conscious effort to coordinate the content of my courses with that of other teachers
- When addressing particular instructional challenges, I feel comfortable asking for advice or help from other teachers
- I feel comfortable giving feedback to other teachers on ways they might improve their instruction

4) Collaboration on Instruction (5 items. Alpha = 0.88)
- 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree")

How well does each of the following statements describe the teaching culture of your school or SLC ("Small Learning Community" if you teach in a large high school divided into SLCs)?
- I receive meaningful feedback on my performance from colleagues

How well does each of these statements describe how teachers work together in your school or SLC (if you teach in a large high school divided into SLCs)?
- We share and discuss student work regularly
- We meet regularly to review student performance on benchmark assessments
- We discuss particular lessons that were not very successful
- We work together to improve instruction

5) Culture of Assessment Use (2 items. Alpha = 0.81)
- 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree")

How well does each of these statements describe how teachers work together in your school or SLC (if you teach in a large high school divided into SLCs)?
- We use a variety of assessment strategies to measure student progress

- We use assessment data to evaluate our curriculum and instructional practices

6ab) Leadership in School or SLC (These three scales derive from the same survey question)
- 5-point Likert-type frequency scale, ranging from 1 ("Never") to 5 ("Always")

Now consider leadership in your school or SLC. Please indicate the extent to which leader(s) do each of the following... School/SLC leaders...

a) Leadership in School or SLC: Community Building (2 items. Alpha = 0.89)
- Actively seek and make use of diverse and controversial views
- Negotiate successfully between opposing points of view

b) Leadership in School or SLC: Data-based Improvement (3 items. Alphas = 0.93)
- Use data to identify patterns to inform decision making
- Use objective evidence to identify, frame and solve problems
- Use data to evaluate the effectiveness of decisions

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