

A Three-Dimensional Theoretical Framework for
Understanding Teachers' Use of Classroom-Based Data in Collaborative Inquiry Groups

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Collaborative teacher inquiry is increasingly seen as holding great potential for teacher learning and improving student learning. Yet, this type of work presents many challenges. Traditional school cultures of teacher privacy, congeniality, and conversations characterized by “coblaboration” (Perkins, 2003, as cited in Fullan, 2005, p. 48) are difficult to overcome (McLaughlin & Talbert, 2006). Despite these challenges, stories are emerging in the research literature that demonstrate the gradual changes that teachers can make and identify characteristics of successful groups and the support that contributed to their progress.

For the past five years, we have been researching the formation and development of teachers’ professional learning communities (PLCs) in secondary science and mathematics. These teachers were supported by a three-year professional development project (Partnership for Reform in Secondary Science and Mathematics or PRiSSM) that helped them engage in a collaborative inquiry cycle (see Figure 1). This paper provides an overview of an emerging theoretical framework grounded in our analysis of case studies across three of the participating districts. Late in the first year of the PRiSSM project, it became apparent teachers had difficulty in identifying and using classroom-based data that would inform their collaborative work. In our case study analysis, we looked for evidence of teachers’ interactions associated with data; from this the theoretical framework we present here emerged. Based on the analysis of PLC meeting observations, transcripts, and artifacts, and teacher interviews, we generated three dimensions relevant for situating a collaborative inquiry group’s work within the inquiry cycle. We present an overview of these dimensions: 1) the nature of teachers’ dialogue about data; 2) teachers’ stance toward classroom-based data; and 3) teachers’ exploration, collection, and analysis of data (their research design).

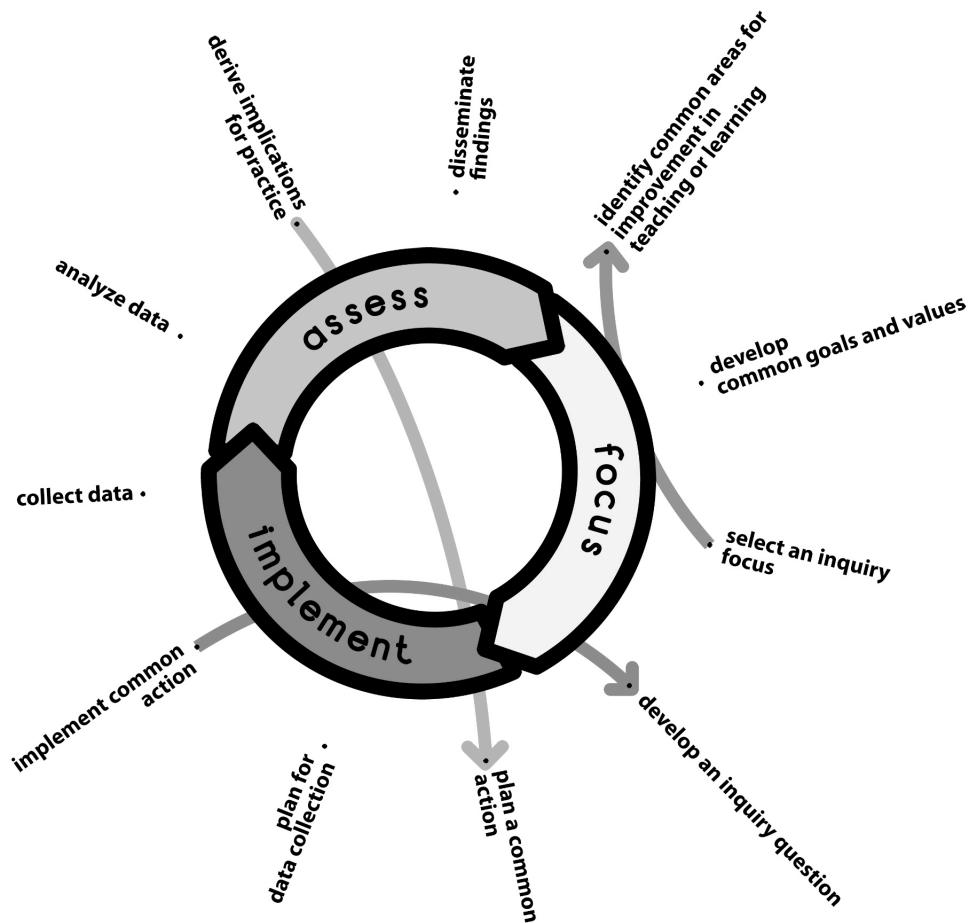


Figure 1. The Collaborative Inquiry Cycle

The Nature of Group Dialogue

“[We struggle] with having professional inquiry discussions, digging into a problem, finding out what is at issue with the students, looking at what the professional research says about it, getting in deep” (Leon, middle school science teacher).

As Leon notes, teachers have great difficulty in pushing their conversations beyond what Little and Horn (2006) call “routine conversations” that center on descriptions of classroom activities and problems. Teachers have little experience in conducting conversations that are less about sharing activities, information, and student anecdotes and more about raising and pursuing questions about learning goals, instructional practices, and all students’ attainment of their agreed-upon goals. Coburn and Russell (2008) describe the depth of teachers’ dialogic

interactions as “more detailed, more focused on issues of student learning, and more grounded in real and complex situations in their classrooms” (p. 219).

We examine the nature of teachers’ PLC data-based dialogue along a continuum from negotiation to consultation. Teacher dialogue is often characterized by the sharing of teaching stories (Garet, Porter, Desimone, Birman, & Yoon, 2001; Krebs, 2005; Little, Gearhart, Curry, & Kafka, 2003; McLaughlin & Talbert, 2006), such as specific incidences of successful or failed lessons and descriptions of students who did or did not learn. When these stories of practice are left unexamined, we characterize the nature of the *dialogue as consultation*. We draw from Grossman, Wineburg, and Woolworth’s (2001) description of pseudocommunity, which is a dialogic norm where teachers “behave as if we all agree” and maintain an “illusion of consensus” (p. 955) about their values and beliefs. In dialogue as consultation, teachers avoid disagreements or challenges that may lead to conflict. Conversational turns are relatively unconnected as teachers share ideas and practices but do not delve deeply or critically into meaningful issues. For example, teachers may share the class averages for students on the most recent vocabulary test and use this as evidence that instruction was more or less successful. While questions may be asked, these tend to be technical in nature (“Was this a higher average than in the last unit?” “What activities did the students engage in to learn the vocabulary?”). Consultation tends to be additive in nature, providing ideas, information, or skills that can be adopted, adapted, or ignored in the privacy of one’s own classroom.

We view *dialogue as negotiation* as holding much more potential for transformative teacher learning. Our conception of negotiation begins with Wells’s (1999) description of dialogic inquiry where teachers exhibit a “willingness to wonder and question” as they intentionally seek to understand each others’ statements, actions, and the ideas behind them. Teachers’ dialogic interactions characterized by negotiation surface differences in teachers’ beliefs and knowledge and these are questioned, examined, and reconstructed. While teachers pose questions to each other in both forms of dialogue, it is how these questions are taken up in subsequent conversational turns that distinguishes the nature of the discourse. When dialogue is

characterized by negotiation, conversation about a specific idea is sustained and the conversational turns are connected as group members attempt to co-construct meaning. This type of dialogue is risky for teachers, as probing questions reveal potentially conflicting beliefs (about learners, teaching, expectations), gaps in content knowledge, or challenge other forms of knowledge for teaching (Shulman, 1987; Shulman & Shulman, 2004).

In our research with seven PLCs, we find that teachers' dialogic interactions may range between the extremes within one meeting and over time, as topics and group membership fluctuate. Our analyses situate a teacher group's *collective stance* (as opposed to individual stances) *for a given time period* along this continuum. We have found that in some PLCs, there are teachers who come to the group with a pre-existing inquiry stance (Cochran-Smith & Lytle, 1999; Jaworski, 2006) and are able, at times, to push the conversation deeper. Alternately, we have also seen resistance from others to dialogue as negotiation. Our ongoing analysis of the seven PLC cases continues to investigate what supports teachers in moving toward dialogue as negotiation.

Improving and Proving Stances toward Classroom-Based Data

Drawing from Charalambos & Silver's (2008) approach to understanding how individual teachers assess student work, early in our research we perceived differences in the way that teachers groups made use of data. We characterized two approaches to using student work as *improving* and *proving*. The *proving* stance is a way of looking at data that foregrounds a quantitative approach to student work, spending much time on calculating percentages, scoring, making broad categories such as "got it" and "don't got it." These evaluations are summative in nature and represent the end of a learning cycle and shift to the next topic or task at hand. Teacher conversations at the end of a learning cycle have limited opportunity to influence instruction or further address student learning. In several cases, teachers assumed that they were expected to report achievement gains to outside stakeholders, such as administrators or colleagues. Numerical results, such as class averages or individual student scores, are gathered to verify that teachers' interventions were effective or that students' achievement had improved.

This approach is not unpredictable given the pressures put on teachers through high stakes quantitative tests (Gamson, 2007). While “data-driven decision making” has become the latest trend, how teachers think about this data has tremendous implications on how helpful and useful it is to teachers.

Another stance that PLC groups took when approaching data was an *improving* stance. When teacher groups took an improving stance, they accessed and discussed student work in an effort to extract information that would inform their thinking about students’ thinking, teachers’ practices, and learning expectations. An improving stance is characterized by the use of varied forms of assessment intended to elicit students’ understanding and misconceptions. These assessments can have meaning to the teachers as they also discuss content expectations, and negotiate what those expectations are and what those might look like in student work. Teachers who took an improving stance discussed among the group what classroom practices were needed for students to make gains, and they continually asked questions of each other throughout their inquiry cycle. Research suggests that an improving stance produces richer understandings and greater potential for growth in teachers when compared to a proving stance.

Research Design in a Collaborative Inquiry Group

“You have to look in the tank from different angles,
so we have to have a lot of different kinds of data.”

“Qualitatively is hard to grasp.”

Collaborative inquiry involves teachers in determining what data can inform their inquiry question and then designing the tools and processes for data collection and analysis. Comments such as the above (from classroom teachers in our research) illustrate emerging understandings and difficulties in enacting collaborative teacher inquiry, based on student data, to inform classroom practice (Kazemi and Franke; 2004; Krebs, 2005). Decisions to utilize data, which data to utilize, and how to analyze data have been shown to be both important to and difficult for teachers engaged in collaborative inquiry (Kazemi & Franke, 2004; Little, Gearhart, Curry, & Kafka, 2003). We have seen that teacher groups often lack experience in identifying classroom-

based data sources beyond tests and quizzes. Additionally, our research shows that teachers are often stymied in determining how to make sense of the data they do collect. As Hargreaves and Fullan (1998) have argued, teachers need to become “assessment literate” in order to properly make data-based instructional decisions. Teachers can become data rich and information poor when initial decisions about data selection, collection, and analysis are made without careful deliberation, limiting the potential power of future instructional decisions based on these important preparatory processes.

Ikemoto and Marsh (2007) discuss simple and complex approaches to data collection and analysis. We propose that simple data collection strategies limit the potential for understanding connections between teaching and learning. Simple designs reflect data collection from one point in time, one source, one type, or from secondary sources (such as state tests), or aggregated to reflect class average. More complex designs are characterized by data collection across the school year (multiple points in time), from more than one source (multiple teachers, for example, or from the classroom and from state exams) or more than one type of student work (e.g., exit slips and student journals). Regarding data analysis, Ikemoto and Marsh (2007) address several key aspects of interpreting and decoding data that are consistent with our proving-improving continuum discussed above. They distinguish between: 1) the use of assumption versus empirical evidence to ground the interpretation of the data, 2) description of the results versus a more sophisticated analysis that may lead to the generation of new understandings and theories about student learning, 3) individual versus collective participation in the analysis, and 4) a one-time or iterative consideration of collected data (p. 111). As we analyze the data analysis processes in teachers’ collaborative inquiry, we further consider the collective nature of the data itself and its role in the analysis process: 5) analysis of individual teacher data sets, or of a common set of data generated collectively. Complex designs may require more time than teachers have for executing the plan or making use of the data. Based on our research, we believe research designs that exhibit a balance of simple and complex features are the most powerful for teacher learning.

We also argue it is important to distinguish teachers’ exploration of data sources

independently from their actual data collection methods. This argument is grounded in our observations of more than thirty different professional learning communities over three years, and the difficulties they exhibited in determining what data to collect. As teachers consider which data sources to use to inform their inquiry focus, a more simple approach would be to choose data that is readily available and familiar, such as student grades or an in-class summative examination. In a more complex approach, teachers might consider the comparison of multiple sources of classroom-based data in relation to their research question and goals. Oftentimes, teachers' exploration of potential data sources is much more complex than the collection plan they ultimately implement.

Concluding Remarks

Teams of teachers are now expected to be more deliberate and systematic in looking at student data, to critically reflect on problems of practice, to gain exposure to others' ideas, to critically evaluate how others' ideas differ from their own, and to apply new understandings in practice. Perhaps the most important finding from this study is that attention must be given to supporting teachers' understandings of the nature and purposes of dialogue to enhance understanding of varying perspectives and increase commitment toward collective action. Additionally, teachers need opportunities to deepen their knowledge and skills with regard to the purposes and uses of assessment tools, specifically those tools that lead to greater understanding of student learning needs, challenges, and achievement.

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