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Improving Teacher Effectiveness through Structured Collaboration: A Case Study of a Professional Learning Community

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Abstract

This article reports on the results of a mixed method case study investigating the relationship between professional learning community (PLC) activities and teacher improvement in a first-year middle school. Data were collected from core academic sixth, seventh, and eighth grade teachers using a professional development survey, teacher interviews, and a review of school documents. Results demonstrated that professional learning community activities—that comprised same-subject, same-grade teacher teams—had the potential to achieve significant improvements in teaching effectiveness, but this effectiveness depended on a number of factors. Contributing factors included leadership and organizational practices, the substantive details of PLC activity meetings, the nature of conversations in PLC activities, and the development of community among PLC teams.

Introduction

While education has been an important issue in the United States for many years, passage of the *No Child Left Behind* Act in 2001 pushed issues of teaching and learning to the forefront of the American consciousness. The national debate over the most effective means of improving K–12 education encompasses topics as far ranging as the promise of new technologies, the injection of market competition via school vouchers, and the use of high-stakes accountability testing. Figuring prominently in the federal education budget, however, is a more traditional focus—funding to improve teacher quality. In 2006, for example, the federal government authorized almost 3 billion dollars for improving teacher quality (U.S. Department of Education, 2006). This focus is not arbitrary—while always recognized anecdotally, over the last 15 years teacher effectiveness has become the subject of considerable quantitative and qualitative research, with a growing body of literature suggesting that the classroom teacher can have a significant impact on student learning and achievement (Darling-Hammond, 2000; McCaffrey, Lockwood, Koretz, & Hamilton, 2003; Sanders & Rivers, 1996; Wenglinsky, 2002; Wright, Horn, & Sanders, 1997).

The most effective way to improve teaching quality, however, is a contentious issue, largely because the constituent elements of teacher effectiveness are still a topic of debate. While numerous studies and policy proposals have addressed teacher inputs—such as salary, education level, and certification requirements—in an attempt to improve teacher effectiveness, a number of recent reports and meta-analyses question the relationship between teacher inputs and teacher quality (Darling-Hammond & Youngs, 2002; Wenglinsky, 2000). According to Wenglinsky (2000), "Research has not consistently demonstrated a link between teacher inputs, such as salaries and education levels, and student outcomes, such as scores on standardized tests"

(p. 6). Instead, a counter body of research makes a compelling case that teachers' impact on student achievement is less dependent on teacher inputs and more a function of daily, classroom-level curricular and instructional decision-making (Joyce & Showers, 2002; Stigler & Hiebert, 1999; Wenglinsky, 2000, 2002).

Given these insights—that teachers are a primary school-based link to student achievement, and that pedagogical decision-making is a key lever in the teacher-student dynamic—the federal support of teacher professional improvement represents a logical and important investment. For school-based leaders working to maximize student learning and achievement, identifying opportunities to encourage and support classroom-level teacher improvement is a top priority. This is especially true at the middle school level, where issues of student learning and teacher quality are manifest. In a review of data from the Third International Math and Science Study (TIMSS), Heller et al. (2002) noted that, "In mathematics and science, U.S. fourth-graders reached a higher achievement level than their peers in almost every other developed nation. By the eighth grade, U.S. students had slipped to the middle of the list of nations and under-performed even students from several less-developed nations" (p. 1). Some researchers attribute this drop in achievement to teacher quality issues at the middle grades, resulting in part from uneven state licensing practices (Cooney, 1998; Heller et al.). According to Cooney, "Because of practices in teacher preparation, licensure and assignment to classrooms, too many teachers in the middle grades have too little knowledge of the subjects they teach" (p. 1). For the middle school principal, supporting teacher improvement is critical.

Recognizing the importance of teacher effectiveness in the arena of student achievement and school improvement, this study attempted to explore the way in which teacher effectiveness can be impacted by organizational structure, focusing on the "professional learning community" (PLC) school model. The professional learning community model represents an organizational approach that emphasizes faculty commitment to a mission of ensuring student learning, high levels of collaboration, and regular reflection on student and school data (DuFour, 2004b). Using a case study approach, the study explored the PLC structure as an alterative approach to teacher improvement, focusing specifically on the relationship between professional learning community activities and teacher improvement in a first-year middle school.

Professional Learning Communities and Professional Development Features

Traditionally, teacher improvement efforts at the district and school levels have manifested themselves under the formal designation of *professional development,* which typically comprises school-, district-, or conference-based workshops (Ball, 1996; Darling-Hammond, 1996; Garet, Porter, Desimone, Birman, & Yoon, 2001; Little, 1994; Sparks, 1994). Nevertheless, some schools have begun to explore alternative, or reform-type professional development activities that go beyond the more traditional teacher workshops. Examples of these alternative types include study groups, professional networks, and mentoring relationships (Loucks-Horsley, Hewson, Love, Mundry & Stiles, 2003), and many researchers and experts have suggested that these reform-type activities may respond more effectively to teachers' needs (Ball) and demonstrate a greater propensity to lead to changes in teacher instructional behaviors (Darling-Hammond, 1996; Loucks-Horsley et al.; Stiles, Loucks-Horsley, & Hewson, 1996). Nevertheless, effective and consistent school-based professional development programs are rare (Ball; Darling-Hammond, 1996; Garet et al., 2001; Little; Sparks, 1994; U.S. Department of Education, 2000).

Rick DuFour (2004a) took the concept of alternative professional development one step further. He argued that, rather than treating professional development as a distinct and separate entity or area of focus, as has commonly been the case, teacher improvement should be approached as a natural byproduct of larger *organizational management* strategies. While consistent with the notion of reform-type professional learning, this approach changes the conceptualization of professional development per se. Within this model, a school leader addresses teacher improvement tangentially, encouraging actions such as teacher collaboration, dialogue, and reflection through organizational structures and expectations rather than through formalized and scheduled "professional development" experiences. Professional development therefore becomes an integral part of daily routines, nominally indistinguishable from regular organizational behaviors, i.e., organizational structure becomes a primary agent directly mediating teacher professional growth. In DuFour's words, "the best staff development happens in the workplace rather than in a workshop" (DuFour, 2004a, p. 63).

DuFour's assertion that organizational structure and philosophy can connect to educational outcomes builds upon a growing literature base (Darling-Hammond, 1996; Hord, 1997; Little, 1994; McLaughlin & Talbert, 1993; Rosenholtz, 1989). For example, in a summary of five years of research conducted at the Center for Research on the Context of Secondary School Teaching, McLaughlin and Talbert noted that "teachers' responses to today's students and notions of good teaching practices are heavily *mediated by the character of the professional communities* in which they work" (p. 8, emphasis in original). In an evaluation of high school restructuring efforts, Lee, Smith, and Croninger (1995) found that schools organized under an "organic" model (which includes certain structural elements, such as reduced hierarchy and increased collaboration) experienced higher achievement rates and smaller achievement gaps than more traditionally structured schools.

In commenting on the work of Lee and associates (1995), however, Rowan (1995) cautioned that, "It is not structural change per se that creates successful schools. Instead, structural changes succeed in improving school performance only if they are consistent with, and support changes in, work practices (e.g., authentic instruction), and only if they are undertaken by a committed work force of teachers" (p. 15). DuFour's model of organizational structure, the "professional learning community" model (DuFour & Eaker, 1998), showed this focus on work practices and emphasized specific work-related organizational behaviors; by DuFour's (2004b) definition of a professional learning community, school leaders should require teachers to establish individual and organizational commitment to a common mission and goals centered around ensuring student learning; collaborate regularly on curricular, instructional, and organizational decisions; and collect and analyze organizational data and results. Echoing Rowan's focus on work practices, DuFour (2004a) argued that:

> When teachers work together to develop curriculum that delineates the essential knowledge and skills each student is to acquire, when they create frequent common assessments to monitor each student's learning on a timely basis, when they collectively analyze results from those assessments to identify strengths and weaknesses, and when they help each other develop and implement strategies to improve current levels of student learning, they are engaged in the kind of professional development that builds teacher capacity and sustains school improvement. (p. 63)

DuFour's (2004a) emphasis on teacher collaboration seemed to align well with the middle school model. As Arnold and Stevenson (1998) noted, teaming has been an emphasized component of the middle school concept since the 1960s, and the professional learning community model could be seen as a natural extension of the existing use of teacher teaming in many middle schools. Nevertheless, DuFour's (2004a) description of collaboration differed in many ways from the traditional teaming model emphasized at the middle level. For the most part, teaming in middle schools has been seen as interdisciplinary, bringing together from two to five teachers that share common students but teach different subjects (Erb & Doda, 1989; Rottier, 2001). The advantages of this type of structure are typically seen in the areas of relationships (e.g., teachers developing closer, more consistent relationships with their students), administrative consistency (e.g., setting consistent rules for behavior, homework, and the like), instruction (e.g., possibilities for sharing generalized instructional practices, such as cooperative learning), and curriculum (e.g., creating a coherent curriculum across subject areas).

In contrast, DuFour's (2004a) description of collaboration focused around teachers of the same subject identifying a common curriculum, developing common assessments aligned to that curriculum, and then analyzing common assessment data to make instructional changes. Within DuFour's (2004b) model of a professional learning community, interdisciplinary teaming would not be sufficient because it obviates the opportunity for teachers to focus on instructional practices and student learning tied to a common curriculum. For middle school educators, therefore, DuFour's (2004b) definition of a professional learning community represented a realignment, or at the least a significant extension, of the traditional teaming model.

The goal of the present study was both to address DuFour's claim that PLC-type activities lead to teacher improvement and to describe the relationship between same-subject PLC activities and teacher improvement in a middle school context in depth. To describe PLC activities, the study relied upon the literature surrounding teacher professional development as a critical lens of analysis. Specifically, the study used earlier research by

Garet and associates (1999), which attempted to identify the features of "high quality" professional learning experiences that connect to improvements in teacher content and pedagogical knowledge and skills, and to improvements in teacher instructional practices. Garet et al.'s study spanned three years and focused on professional development programs throughout the country that had been funded through the Eisenhower Professional Development Program. The authors identified the following six high-quality professional development features, which demonstrated either an indirect or direct qualitative and quantitative relationship to teacher improvements:

- Activity type (for example, traditional workshops versus reform models, such as study groups or peer mentoring)
- Activity duration (including both contact hours and span of time covered)
- Collective participation (i.e., whether participants are grouped by some common characteristic, such as grade level, discipline, school)
- Focus on content (i.e., the degree to which professional development develops teacher knowledge of content areas)
- Promoting active learning (the extent to which teachers are "active" during professional development, such as observing other classrooms, planning classroom implementations, or reviewing student work)
- Fostering coherence (the extent to which professional development connects to individual, school, and district goals and needs)

Garet et al.'s (1999) study, therefore, provided a specific language and framework to describe and explore the relationship between professional learning community activities and changes in teacher effectiveness. By addressing those features of professional development activities that researchers had found to relate to teacher improvements, this study was able to critically describe the extent to which and ways in which professional learning community activities related to changes in teacher effectiveness in a middle school environment. In doing so, the study focused on the following specific research questions, situated within the context of a first-year middle school:

- Which features of professional learning community activities, if any, demonstrate a significant relationship with changes in teachers' content and pedagogical knowledge and skills and with changes in teachers' instructional practices?
- Do the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, vary based on specific teacher characteristics—including years of teaching experience, grade level taught, and subject taught?
- In what ways do organizational and personnel factors—specifically, intra-organizational social dynamics, the personality and leadership style of the principal, structured planning time, and use of a block schedule—influence the teacher improvement efficacy of professional learning community activities?

Methodology

Using a case study format (Merriam, 1998; Yin, 2003), this study focused on a first-year middle school that had incorporated the professional learning community principles advocated by DuFour (2004b). The study site, Central Middle School, was located in a large, southeastern school district and served a population of predominantly white, middle-class students. The study focused on the 2004–05 academic year and relied on both quantitative and qualitative data to address the research questions. First, in an attempt to identify the relationship between professional learning community activities and teacher improvement, sixth, seventh, and eighth grade core academic teachers (i.e., language arts, math, science, and social studies teachers) at the test site were asked to complete a survey concerning the professional learning community activities in which they had participated. The survey content and data analysis protocol were taken directly from the Teacher Activity Survey used by Garet et al. (1999) as part of their national evaluation of the Eisenhower Professional Development Program. Survey questions addressed self-reports of teacher experiences and behavior, and the survey was initially distributed to teachers drawn from a national sample that included 93% of all districts in

Table 1
Relationship between Professional Development Features and Changes in Teachers' Knowledge and Skills and Changes in Teaching Practices

Professional Development Feature	Correlation to Changes in Teachers' Knowledge and Skills	Correlation to Changes in Teaching Practices
Content focus	.402	.214
Active learning	.313	.372
Coherence	.753	.612

the country (Desimone, Porter, Garet, Yoon, & Birman, 2002, p. 83). The survey data for this study were analyzed using descriptive statistics. Howell (2002) noted that descriptive statistics are appropriate when the "purpose is merely to describe a set of data" (p. 5). Because of the small size of the Central Middle faculty, it was determined that the use of descriptive statistics would be most appropriate in addressing the research questions.

Survey results were used to (a) identify the features of professional learning community activities that demonstrated a significant relationship with changes in teachers' content and pedagogical knowledge and skills and instructional practices; and (b) identify any variation in the features of professional learning community activities, along with changes in teachers' content and pedagogical knowledge and skills and instructional practices, based on years of teaching experience, grade level taught, and subject taught.

In addition, a purposefully selected group of ten teachers from the same school participated in qualitative interviews focusing on the inter-relationship of professional learning community activities, professional development features, teacher and school characteristics, improvements in individual teachers' knowledge and skills, and individual teacher instructional behavior changes. School documents were also analyzed to support the analysis of these relationships.

Results

This section begins with a brief description of Central Middle School before continuing to an analysis of results. Study results were divided into two broad categories—quantitative results from the Teacher Activity Survey, and qualitative results from the teacher interviews and document review—and analyzed separately using a concurrent triangulation approach (Creswell, 2003; Greene, Caracelli, & Graham, 1989).

Central Middle School

In 2004–05, Central Middle School was a first-year school serving sixth through eighth grade students in a large, semi-urban district in the Southeast. In the 2004–05 school year, Central Middle had 662 students and 44 classroom teachers, 24 of whom were considered core academic teachers. At the sixth grade, each teacher taught two subjects—either language arts and social studies or math and science—and teachers were paired into two-person teams that shared common students, such that a language arts/social studies teacher would share roughly 50 students in common with a math/science teacher. At the seventh and eighth grades, teachers typically taught only one subject (language arts, math, science, or social studies), and teachers were organized into three- or four-person teams sharing common students. All of the core academic teachers were organized into multiple professional learning community teams, which met on a regular basis. The majority of PLC time was spent in same-grade, same-subject teams (e.g., all seventh grade language arts teachers), which represented a departure from the more traditional focus on interdisciplinary team collaboration at the middle school level (Erb & Doda, 1989; Rottier, 2001). Teachers did also meet regularly as whole grade levels, as same-student teams (i.e., teachers who shared common students), across grade levels by discipline, and as a whole faculty, but significantly less time was devoted to these meetings than to same-subject, same-grade team meetings.

Another important facet of Central Middle concerned its development prior to opening. The principal for Central was hired in early 2005 and was given approximately six months to work full-time to manage the development of the school prior to its opening in August. The principal was also able to hire the entire faculty from scratch. Interview and document data revealed that the principal was interested in developing a professional learning community along DuFour's (2004b) model from the first day he was hired, and his personnel decisions were influenced by his desire to hire educators interested in and committed to PLC principles, especially collaboration.

Prior to the school opening, staff members participated in a number of activities intended to engender collaboration. These activities ranged from personality typing and team building exercises to developing a school mission statement. In addition, staff members spent many hours meeting in grade-level teams to begin developing norms and expectations related to issues such as student discipline policies, scheduling, and grading expectations.

Results from the Teacher Activity Survey

Of the 24 full-time core academic teachers at Central Middle School during the 2004–05 academic year, 20 were still working at the school at the time the study was conducted (of those four no longer working at the school, two had left the teaching profession, one was on maternity leave, and one had moved to a job at another school). Teacher Activity Surveys were distributed to all 20 eligible teachers; 15 surveys were completed and returned, representing a response rate of 75%.

The Teacher Activity Survey provided results on the extent to which Garet et al.'s (1999) professional development features were evident in professional learning community activities and the overall relationship between professional development features and teaching outcomes. Data analysis focused on four of Garet et al.'s identified professional development features: (a) collective participation, (b) content focus, (c) active learning, and (d) coherence (activity type and duration were consistent throughout the school, and were therefore not included in the analysis). Of the four professional development features analyzed, three—content focus, active learning, and coherence—exhibited a positive relationship to changes in teachers' knowledge and skills and changes in teaching practices, as seen in Table 1. This suggests that, as the extent to which each of these three professional development features was increasingly evident in professional learning community activities, teachers indicated increasing levels of change in their knowledge, skills, and practices.

Analysis of results also indicated important differences in the manifestation of professional development features across faculty sub-groups. While some differences were identified for individual professional development features across subject areas and teacher years of experience, these differences appeared to

Table 2
Extent to Which PLC Activities Included a Focus on Content, Provided Opportunities for Active Learning, and Fostered Coherence by Grade Level

	Content focus (0–2 pt. scale)		Active learning (0–20 pt. scale)		Coherence (0–9 pt. scale)	
	Mean	SD	Mean	SD	Mean	SD
All respondents	1.29	(.61)	9.8	(4.34)	6.8	(1.83)
6th grade	1.17	(.75)	11.9	(3.95)	6.7	(1.35)
7th grade	1.75	(.50)	9.0	(5.13)	8.4	(0.86)
8th grade	1.00	(.00)	8.0	(3.86)	5.5	(2.11)
National sample	1.36	(.72)	3.6	(3.49)	5.9	(1.92)

Table 3
Extent to Which PLC Activities Led to Enhancements in Teachers' Knowledge and Skills and Improvements in Teachers' Classroom Practices, by Grade Level

	Enhanced knowledge and skills (1–5 pt. scale)		Improvements in classroom practices (0–3 pt. scale)	
	Mean	SD	Mean	SD
All respondents	3.70	(.78)	2.00	(.61)
6th grade	3.90	(.54)	2.23	(.30)
7th grade	4.40	(.54)	2.35	(.60)
8th grade	3.00	(.60)	1.36	(.43)
National sample	3.19	(.89)	1.27	(.80)

represent anomalies rather than true patterns. In contrast, however, there existed a clear, consistent split in the manifestation of professional development features along grade-level lines; eighth grade teachers consistently reported lower incidences of high-quality professional development features and lower levels of professional improvement than did sixth and seventh grade teachers.

Table 2 summarizes the results for those professional development features that exhibited clear differences across grade levels: content focus, active learning, and coherence. In addition, Table 2 includes results from Garet et al.'s (1999) nationally representative sample of teachers that had participated in Eisenhower-supported professional development activities. For each professional development feature, eighth grade teachers' scores trended lower than both sixth and seventh grade teachers' scores. When compared to national data, Central Middle's average scores trended slightly lower than a national sample in content focus, slightly higher in coherence, and considerably higher in active learning.

Table 3 displays results for teacher outcomes by grade level, including enhancements in teachers' knowledge and skills and improvements in teachers' classroom practices. Table 3 also includes results from Garet et al.'s (1999) nationally representative sample. As a faculty, Central Middle teachers reported relatively high levels of change in knowledge and skills, with an average score of 3.7 on a 1–5 point scale (where 1 = not at all and 5 = great extent). There were, however, important differences across grade levels. The seventh grade teachers reported the highest levels of change with an average score of 4.4, while sixth grade teachers had an average score of 3.9. These scores represent high levels of reported change independently, but are also particularly high when compared to the national average of 3.19 obtained in Garet et al.'s study. The lowest score was that of eighth grade teachers, with an average of 3.0, which was markedly different from the seventh and sixthgrade scores, and fell just below the national average reported by Garet et al.

As a faculty, Central Middle teachers reported moderate levels of change in their teaching practices as a result of participation in professional learning community activities, with an average score of 2.0 on a 0–3 point scale (where 0 = no change and 3 = significant change). As was true with changes in knowledge and skills, there were important differences across grade levels in terms of changes in teaching practices. The seventh grade teachers reported the highest levels of change with an average score of 2.35 (indicating more than "moderate" but less than "significant" changes in teaching practices), and sixth grade teachers had an average score of 2.23. These scores represent high levels of reported change independently, but are also particularly high when compared to the national average of 1.27 obtained in Garet et al.'s (1999) study. The eighth grade teachers had the lowest score, with an average of 1.36 (indicating more than "minor" but less than "moderate" changes in teaching practices). This score was markedly lower than the scores for sixth and seventh grade teachers, and slightly above the national average reported by Garet et al.

Results of Document Review and Teacher Interviews

To collect more individualized, qualitative data, ten purposefully selected teachers were interviewed about professional learning community practices. Interviewees were selected on the basis of grade level, subject area, and teaching experience to represent a broad spectrum indicative of the general population of teachers in the school. In addition, team and school-level documents were reviewed, including minutes from grade-level and school meetings, the school Web site, the School Improvement Plan, and internal surveys.

The interviews and document review resulted in data that suggested trends at the school and sub-group levels, and the data also revealed individual anomalies. After multiple stages of analysis, the data were grouped and are presented here in the following three categories:

- The nature of PLC activities at Central Middle
- The relationship between PLC activities and teacher improvement for the interviewed teachers
- PLC activities in the context of the organization

The nature of PLC activities. Across all three grade levels, teachers at Central Middle reported meeting regularly in same-subject, same-grade teams to discuss administrative issues, such as consistent discipline practices, grading procedures, parent information, etc. At the sixth and seventh grades, where professional learning teams had between three and five people per team (i.e., three to five people teaching the same subject at the same grade level), these meetings extended to collaboration focusing on curricular and instructional issues, but this practice had not happened to the same extent at the eighth grade, where teams were limited to two people (lower eighth grade enrollment at the school resulted in a smaller eighth grade teaching staff). While at the eighth grade, teachers might "swap ideas, talk about where we are in the curriculum, share some instructional materials," at the sixth and seventh grades this extended to deeper levels of collaboration:

> We all had common assessments, common lessons, we all taught the same lessons. We all take our previous knowledge and our previous work that we had done on a particular unit, bring that to the table, talk about best practices that we had used, then we all used each others' activities and ideas to try it out. And also we reflected afterwards how we felt about activities and units, how well students had done, we did pre and post assessments to chart student growth—that guided our instruction.

While deeper collaboration does appear to have occurred at the sixth and seventh grade levels, one teacher noted an interesting perspective on that collaboration: "It's really about teaching—what and how are we going to teach—but it's not about student learning…. I think people have the intention of focusing on student learning, but really they focus on how they teach—I have yet to hear people talk about how many students have learned a concept, but I hear people talking about what great teachers we have—I think all our teachers are very strong, but you don't hear as much about the kids." In other words, most PLC conversations focused on what and how teachers would teach, but very little time was devoted to identifying how well students were learning and which strategies seemed to be most successful in promoting student learning. Interviews suggested that some conversations focused around student learning, and that these conversations were increasing in frequency as the year progressed, but through a review of the notes of various PLC team meetings, it became apparent that this teacher's comment was insightful.

Relationship between PLC activities and teacher improvement. Almost all of the sixth and seventh grade teachers indicated that same-grade, same-subject PLC activities had an impact on their professional improvement, and the indicated catalyst was most often the opportunity to collaborate with others. As one sixth grade math teacher said:

> My development in previous years was based on my own reflection and perceptions—I only had myself. This year I can reflect through the eyes of four to nine other people. When you're only looking at it from your own perspective, you can't see that it might be you. When you have so many eyes to see things, that alone has helped with my reflection and growth—ten times more growth this year than in previous years because I'm seeing things through at least ten other eyes. I have the opportunity to not only work with them and reflect with them, but to see things from their perspective as well as my own.

For eighth grade teachers, PLC activities seemed to hold a more tenuous relationship to professional improvement. While both eighth grade teachers interviewed spoke positively of PLC activities, they attributed any professional growth to factors outside the PLC structure. In one case, the teacher attributed professional growth to working with a new age group and independent improvement efforts, noting that, "Not much has changed as a result of PLC activities—I do a lot of reading in math journals, search on the Internet for best practices in math—it all comes back to problem solving, authentic problems, getting kids to show different ways to get to answers—that seems to be the consensus of the best way to teach."

The idea of professional collaboration and support was one of the strongest themes to emerge from the interviews. Another sixth grade teacher said, "Before [at previous school] I was thrown into a pool and it was sink or swim, here there is such a support system, I have grown tremendously." Even at the eighth grade, the idea of collegial support was important: "Knowing that there's somebody down the hall if you have a question, if you're wondering how to approach something instructionally, somebody you can talk to about it, won't give you the feeling that you have to figure it out yourself." The other eighth grade teacher mentioned the absence of a greater number of PLC members as an obstacle to professional growth, noting that "When there are only two in your PLC, there need to be more, with only two in a PLC and we disagree, and you know I know I'm right, you either convince or you give up, and if you really should be teaching one thing and there's just two of you and you disagree that's hard, so the PLC needs to be bigger so you can have a majority."

The other side of larger groups, however, was the added difficulty of reaching consensus and the gradual process of group norming. As one teacher pointed out, "Because we all have agreed to do the same lesson and format, at times when I would want to go off in a different direction or do something in a different way, it has been frustrating—that's why we reflect on the lessons afterwards, those reflections really help—in a way it restricted me this year but it has also made me grow and be more open to different ideas." Norming was identified as both a positive process, in that it led to experimentation with new teaching techniques, and a negative process, in that individuals sometimes felt constrained to deviate from agreed-upon norms. In addition, the regular process of collaboration resulted in more frequent personality conflicts. As one teacher put it:

> It's been hard for me to see people get so upset over things that long term are not going to have a huge impact. It has been really difficult to bite my tongue sometimes and say it doesn't matter because I think, you have to talk about things and work things out, when people take things personally it becomes a problem… When you're dealing with people in the PLC the way we have, when people are sharing ideas, dealing with conflict has been interesting, to say the least.

PLC activities in the context of the organization. Across grade levels and subject areas, teachers were clear in placing the successes of the PLC model within the larger organizational context. That is, while teachers spoke very positively about PLC activities, they indicated that it was not just the PLC model per se that had been successful, but also rather the PLC model as one important piece in a web of organizational factors. Teachers alluded to the combination of personalities at Central, the principal, the fact that it was a new school, and the structure of the daily schedule as factors that underlay Central's perceived success.

The first tenet of a PLC is a shared commitment to student learning, and the fact that Central was a first-year school allowed the faculty to set that commitment from day one. As one teacher said:

> A big success that came about was it being a brand new school so vision was set forth in the beginning. When we were being interviewed about collaboration, we all had the same goal, the same vision, we all knew that we would be working together, so there were no issues there. I think that is the main reason that we are so successful—you have to have everyone on the same page, you have to have everyone ready to work because it takes a lot. When you have five people you have different ideas and styles, but having the underlying goal that we're here to serve the students, to do what's best for students, that's what's made it so successful.

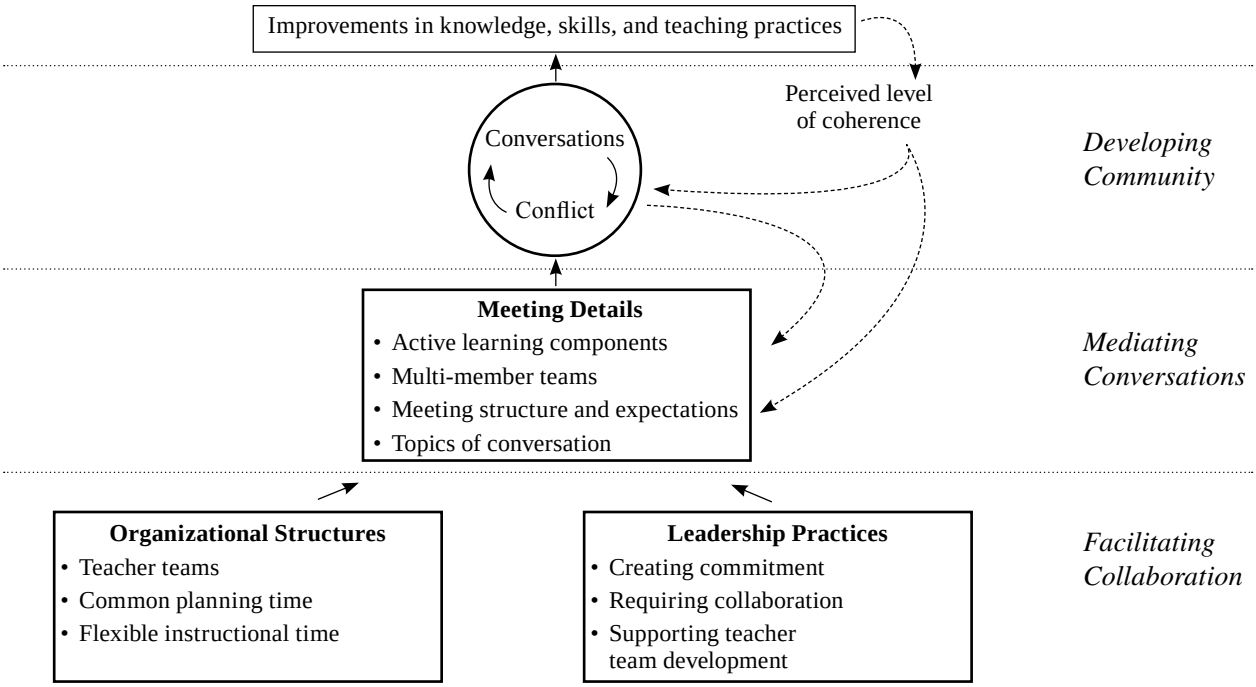

Figure 1. The relationship between professional learning community activities and teacher improvement at Central Middle School.

Leadership emerged as one of the most important factors underlying perceived success. Some teachers spoke specifically of the role that the principal played in the school. One teacher suggested, "I attribute it all to [the principal] because of the people he hired, setting those standards and those goals for us at the very beginning, making sure we understood what was to be expected of us." Another teacher said, "He hired the faculty, he delegated that authority out, but the amount of responsibility and faith he placed in us, he set that up as the model and people rose to the challenge." Yet another reported, "I think that all of the success is attributable to [the principal]—he is a motivator, whether through fear, praise, intimidation, he uses lots of strategies to get people to work in the PLCs. I attribute it all to him—he is the engine behind the machine."

Finally, interviewees identified the school's block schedule and structured common planning time as integral pieces of Central's perceived success. In general, it seemed that form followed function: the block schedule allowed for more student-centered teaching strategies, which were encouraged through PLC activities, and common planning time provided the opportunity for intensive collaboration, which was identified by teachers as the most important element in the perceived successes of PLC activities. One teacher noted, "I don't think we would be able to get as much done without 90 minutes of planning. I hear from other schools how difficult it is to talk to other people in same grade level because they don't have common planning." Another teacher put it simply, "One hundred percent [of the success] is due to common planning time—it would fall apart without common planning time."

Discussion

At Central Middle, a strong positive relationship existed between professional learning community activities and teacher improvement, but this relationship was complex and contingent upon multiple factors at multiple levels. It appears that certain foundational factors—such as common planning time, teacher collaboration required by the principal, and organizational support for teacher team development—created an environment in which PLC activities could contribute to teacher improvement, but these foundational factors were not enough. In addition, the details of professional learning community team meetings—such as the integration of active learning components and the number of PLC members—mattered, but these factors were primarily

important in the way that they supported the development of substantive conversations within PLC meetings around issues of teaching and learning. Ultimately, through an iterative process in which PLC conversations both raised and addressed conflict around curricular and instructional practices, it was the extent to which PLC teams were able to develop a level of team community that determined improvements in knowledge, skills, and teaching practices.

The results of the study are summarized in a model presented graphically in Figure 1. Within this model, three layers of factors describe the relationship between professional learning community activities and teacher improvement. At the first layer, a variety of organizational structures and leadership practices facilitate collaboration. At the next layer, team meeting details serve to mediate the substance of teacher conversations. At the third layer, a cyclical process of conversation and conflict support the development of community, which in turn supports changes in knowledge, skills, and teaching practices.

Facilitating collaboration. The success of the professional learning community structure as an agent of teacher improvement seemed to be interwoven with leadership strategies and organizational structures in a way that was both ubiquitously evident and difficult to disentangle. Interviewees spoke across the board of the importance of common planning time and the powerful impact that the principal had on the character and nature of the school. Nevertheless, data from the Teacher Activity Survey suggest that leadership and organizational factors were not the chief variable in the relationship between PLC activities and teacher improvement; while all teachers spoke to the importance of leadership and organizational strategies in the interviews, the disparity between eighth grade survey results and sixth and seventh grade survey results suggests that much more was at play. That is, each grade level in the building benefited from the same schedule, the same leadership, and the same structured collaborative opportunities, but not all grade levels indicated the same level of improvement. Instead, organizational structures and leadership practices served to create a foundation for collaboration within the school, working primarily in a facilitative, rather than causal fashion.

Mediating conversations. Once the structural and leadership practices were in place to facilitate collaborative practices, the next factor in the relationship between PLC activities and teacher improvement was the nature of professional learning community team meetings and the way in which the details of those meetings served to mediate, either positively or negatively, the substance of PLC conversations. Active learning emerged as one of the most important features of PLC team meetings. PLC activities incorporated significant amounts of group dialogue, and this dialogue was typically driven by active learning components: developing lesson plans, reviewing student work, scoring assessments, and others. While teachers at all grade levels indicated that they participated in active learning components, sixth and seventh grade teachers mentioned a depth to active learning that was not evident at the eighth grade. As an example, while an eighth grade teacher described active learning components in relatively superficial terms—"[we would] swap ideas, talk about where we are in curriculum, sharing some instructional materials"—a sixth grade teacher described active learning components as having considerably more depth:

> We would have weekly meetings where we would plan out our lessons for the week, we would also speak and reflect with peers. We all had common assessments, common lessons, we all taught the same lessons. We all take our previous knowledge and our previous work that we had done on a particular unit, bring that to the table, talk about best practices that we had used, then we all used each others' activities and ideas to try it out. And also we reflected afterwards how we felt about activities and units, how well students had done, we did pre and post assessments to chart student growth—that guided our instruction.

Developing community. Ultimately, teacher improvement within PLCs was driven by the extent to which teachers were able to build a sense of team community. At the heart of the PLC model is the idea of teams of teachers sitting down together and engaging in substantive conversations about issues related to teaching and learning. Through these conversations, teachers share instructional strategies, make decisions about curriculum and assessment practices, and analyze student achievement data. As a result of these conversations, teachers are then expected to learn from each other and to make improvements in what they teach and how they teach it—as one Central Middle teacher put it, "[I've had] ten times more growth this year than in

previous years because I'm seeing things through at least ten other eyes." Implicit in this model is a sense of community among teachers and an effective approach to working within a team. What the Central Middle data reveal is that the process of creating an effective team and building a successful community of teachers that are able to work collaboratively is a difficult and problematic process, but that it is this process that ultimately determined the impact that PLC activities would have on teacher improvement.

Emerging from the Central Middle interview data was a clear disparity between the nature of the teams at the eighth grade versus the nature of the teams at the sixth and seventh grades. Many of the sixth and seventh grade teachers spoke about conflict within their teams and how professional learning community activities often involved negotiation and strong differences of opinion, whereas eighth grade teachers spoke about maintaining individuality and careful consensus. Here are two quotes from eighth grade teachers concerning the nature of their teams and their teams' work:

> [Quote 1] Sometimes it feels like we should do everything the same but some people want to go into teaching because they want to express their own creativity—that shouldn't be forgotten. If you're asked to do something you're not comfortable doing, I don't agree with that—how effective will you be if you don't agree with it?
>
> [Quote 2] With only two in a PLC and we disagree, and you know I know I'm right, you either convince or you give up, and if you really should be teaching one thing and there's just two of you and you disagree, that's hard.

In contrast, the two quotes below describe the work of a sixth grade team and a seventh grade team respectively:

> [Quote 1] Learning to accept the fact that you're not the only one with ideas and that other ideas might be better than yours, it's okay for your idea not to be the best this time, to do the will of the PLC.
>
> [Quote 2] With most groupings of people you're going to have people who tend to dominate and think their way is the right way… having to gently get that person to evolve and try other ideas has been a process… we still have to be productive and we still have to get along…having to balance the voices has been a challenge.

This disparity in team dynamics and conflict management has been studied before in school settings. In a comparison case study of two middle schools, Achinstein (2002) examined the micropolitical factors that can affect the development of teacher community. One of the key features that emerged from her study was the way in which teachers managed conflict within teams. According to Achinstein:

> The kinds of organizational learning purported to result from building community among teachers are deeply linked to how they manage the difference amid their collaboration. The processes of conflict are critical to understanding what distinguishes a professional community that maintains stability and the status quo from a community engaged in ongoing inquiry and change. (p. 446)

One important factor in the development and management of conversation and conflict at Central was the size of the teacher teams. At the sixth and seventh grades, each PLC team had at least three members, whereas the eighth grade teams had only two members (or, in some cases, only one member). While those two-person teams may have ostensibly engaged in some of the same practices as the sixth and seventh grade teams (such as planning lessons together or discussing student work), the nature of the conversations and the team dynamic were different. The focus at the eighth grade was more on maintaining consensus and smooth working relationships than it was on addressing curricular and instructional issues in substantive and potentially contentious ways. Based on this fact, it seems that a basic prerequisite for successful PLC teams is a certain number of members. In reflecting on the nature of their teams, one eighth grade teacher commented on this

fact, "When there are only two in your PLC, there need to be more … the PLC needs to be bigger so you can have a majority."

Grossman, Wineburg, and Woolworth (2001) also explored the idea of teacher community and the spectrum along which the concept of "community" can exist. Grossman et al. worked with a group of high school teachers and attempted to create a professional community over a multi-year time span. What the researchers found was that the teachers went through multiple stages in building their community, moving from what the authors termed "pseudocommunity" to a more substantive and effective team. Once again, the subject of conflict was at the center of team formation. According to the authors:

> As community starts to form, individuals have a natural tendency to *play community*—to act as if they are already a community that shares values and common beliefs… This is called 'pseudocommunity'… The maintenance of pseudocommunity pivots on the suppression of conflict. Groups regulate face-to-face interactions with the tacit understanding that it is 'against the rules' to challenge others or press too hard for clarification. This understanding paves the way for the *illusion of consensus.* Because there is no genuine follow-up, conversation partners are able to speak at high levels of generality that allow each to impute his or her own meaning to the group's abstractions. For example, if notions of 'critical thinking' or 'interdisciplinary curriculum' are never defined, every discussion member can agree to this common cause without giving it so much as a second thought. (p. 955–956, italics in original)

The development of a true professional learning community at Central Middle, along with the realization of the teacher improvement benefits that accompanied that development, was therefore predicated upon a cyclical process of substantive conversation and conflict that appears to have emerged within the sixth and seventh grade teams, but not within the eighth grade teams. As a sense of team community began to develop, two outcomes emerged. First, the development of community created a feedback loop back to meeting details (indicated in Figure 1 by a dotted line); for example, as conflict arose, the teams developed new meeting rules to deal with conflict constructively, such as structuring rules for verbal participation in meetings, and these changes in turn supported deepening levels of community.

Second, and more important, as teams began to develop a sense of community, this created opportunities for teachers to learn from each other. In almost all cases, interview data revealed that the greatest reason given for growth and improvement within professional learning community teams was other team members. That is, as individual teachers grew to trust and respect each other, and as conversations increasingly addressed substantive issues of teaching and learning, teachers were able to "see through each other's eyes" such that each member of the team was able to benefit from the collective wisdom of all members. This process appears to have been frustrating and difficult, and not without its setbacks as the year progressed, but it appears to have had a substantive impact on teacher improvement. And, as team members gained in knowledge and skills, and gradually changed their teaching practices, they became more likely to perceive PLC activities as aligning with their own individual goals and needs, which Garet et al. (1999) would define as coherence. These improvements and perceived levels of coherence then created feedback loops to both the details of meetings and to the substance of conversations (indicated in Figure 1 by dotted lines). As teachers perceived themselves as improving, they increasingly focused their conversations on substantive issues of teaching and learning and they redesigned their meeting structures to facilitate those conversations.

Conclusion

At Central Middle, the primary strength of the professional learning community model was the way in which it opened up opportunities for teachers to learn from other teachers within the building. This represents a departure from more traditional professional development, in which the expertise commonly comes from the outside (Sparks, 1994). In addition, the professional learning community activities at Central represented the school's primary professional development approach; that is, formal professional development time at Central was dedicated almost solely to PLC activities, with little time invested in more traditional professional development opportunities. And, for most of the core academic teachers at Central, learning from each

other was more professionally rewarding and effective than their previous experiences in more traditional professional development had been. This finding has important implications for school leaders looking for ways to improve teaching practice: before looking to the outside, start by looking within.

Getting teachers to a point at which innovation and practice can spread, however, requires work from building leaders at multiple levels. Another clear finding from Central Middle was that, even under the best of circumstances, developing a successful professional learning community is difficult work and requires organizational and leadership strategies that are both foundational and ongoing. As was shown in the model in Figure 1, the principal's efforts translated into both organizational structures (e.g., teacher teams, common planning time) and ongoing leadership strategies (e.g., creating teacher commitment, requiring teacher collaboration). According to this study's findings, these efforts were critical both in terms of planting the foundational seeds that allowed a professional learning community structure to take root, and in terms of nurturing and feeding the PLC as it gradually grew and developed. For school leaders interested in developing a professional learning community, there are two important lessons here: first, that foundational structures must be in place to facilitate the development of a PLC; and second, that ongoing work is critical to the growth of successful practices.

The successes at Central Middle also represent a significant shift from the more traditional middle school conception of teaming. While Central Middle teachers participated in interdisciplinary teams, the primary emphasis in terms of time and work was on same-grade, same-subject teaming, in line with DuFour's (2004b) definition of PLC-type collaboration. This was a marked departure from the more traditional middle school focus on interdisciplinary teaming (Erb & Doda, 1989; Rottier, 2001), but it holds an important lesson for other middle schools. One of the criticisms of interdisciplinary teaming is that the work of teams rarely translates into curricular improvements (Arnold, 1997). According to Lounsbury (2001):

> Interdisciplinary teams continue to be the most distinguishing feature of modern middle schools, and their advocacy has not waned over the last three decades. However, behind the now common organizational presence of teams exists a widely recognized failure to exploit the powerful potential of teaming… Although readily accepting assignments as members of an interdisciplinary team and using common planning time for much collaboration on managerial matters, too many teachers put on the clothes of teaming but continued to teach essentially as they taught before when they were single runners… Teams became symbolic evidences of desired change but did not assure change in the way classrooms were conducted. (p. v–vi)

The results of Central Middle suggest that middle school leaders may need to rethink some of their assumptions around teaming, the primary work focus of teams, and the types of team configurations most likely to lead to real improvements in teaching and learning.

Finally, the story of Central Middle suggests that, even under the best of circumstances, the PLC model will not necessarily lead to exceptional teacher improvements. At Central, the PLC structure was really about facilitating substantive, collaborative, ongoing conversations among teachers about issues of teaching and learning, and while the PLC structure may have increased the likelihood that those types of conversations would take place, by no means did PLC activities ensure that they would. Before those conversations could take place, teachers needed to first develop a sense of community, and the process of building that community was both complex and circuitous. This finding brings to mind a quote by Pascale, Millemann, and Gioja (2000): "Living systems cannot be *directed* along a linear path. Unforeseen consequences are inevitable. The challenge is to *disturb* them in a manner that approximates the desired outcome" (p. 6, emphasis in original). In other words, the development of community was an organic and delicate process that depended upon a balance of clear requirements and open flexibility from school leadership, negotiation of personalities within teacher teams, a sense of coherence between PLC activities and individual goals, and the development of new skills in the area of teamwork and collaboration.

All of this is to say that, while professional learning community activities appeared to be successful in many respects at Central Middle, that success was never assured and the process was difficult. Conflicts clearly arose—and these were conflicts alien to most of Central's teachers, who had typically not been required to work in such close collaboration with colleagues—and teachers needed to develop new skills and attitudes to deal with those conflicts. At schools interested in the PLC model, it is likely that both teachers and administrators would need to develop skills in building and supporting effective teams and in dealing with conflict productively. Because Central Middle was a first-year school, the faculty and school leadership did not have the additional challenge of addressing an existing culture that may have been hostile to collaboration and open conversations. For existing middle schools interested in developing a professional learning community structure, the findings of this study should be taken with an especially large grain of salt. The types of training necessary to prepare teachers and administrators for substantive teamwork and collaboration, along with the challenges of attempting to convert an existing school into a professional learning community, are important areas in which more research would be beneficial, especially given the shift that DuFour's (2004b) conception of teaming represents from the more traditional, interdisciplinary model of teaming commonly found at the middle school level.

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