CHAPTER 3

High-Quality Research-Based Professional Development

An Essential for Enhancing High-Quality Teaching

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- Evidence about professional development as a key factor for improving teacher practices and student learning has increased.
- Characteristics of effective professional development include adequate time, study of content and pedagogical learning, active learning activities appropriate for adults, and follow-up support.
- Professional development can be more effective when it occurs within a culture of collaboration in schools.
- Literacy coaching combines many of the features or characteristics of effective professional development.
- The establishment of professional learning communities in schools requires a different way of approaching leadership in the school (i.e., requiring that teachers function as instructional/teacher leaders).

Research evidence over the past several decades has made it clear: Teacher quality is important. Teachers must have the knowledge and skills that enable them to address the challenges of the 21st-century classroom, which means they must have an understanding of their specific content and how to teach it to meet national, state, and local standards; know how to use technology to promote high-level

learning; and be prepared to teach in ways that enable all students to be "college or career ready" (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009). Although education changes as the demands of the classroom, school, or society change, the importance of teacher effectiveness has been a constant. As stated by Sir Michael Barber and Mona Mourshed, "the quality of an education system cannot exceed the quality of its teachers" (2007, p. 16).

And although teacher preparation programs have a responsibility to send well-prepared teachers into the schools, these novice educators have much to learn in their beginning years and will need ongoing professional learning experiences that help them meet the demands of a specific group of students in a specific context. Likewise, experienced teachers who have been in the system for a period of time understand the importance of ongoing learning as times change, and with them students, materials, and research findings that promote new and different ways of teaching. Moreover, at the present time, we have additional evidence that calls for new ways of supporting teacher learning (Blank & de las Alas, 2009; Bryk, Sebring, Allensworth, Luppescu, & Easton, 2010; Silva, 2008).

Over a 7-year period, Bryk and colleagues (2010) studied 100 elementary schools in Chicago that had improved and 100 that had not. Among other factors contributing to improvement was professional development. They summarize as follows:

> Our results affirm that quality professional development is a key instrument for school change. Most maximum leverage is achieved...when this professional development occurs within a supportive professional work environment where teaching is grounded in a common, coherent, and aligned instructional system. (p. 134)

In their longitudinal evaluation of the Eisenhower Professional Development Program, Desimone, Porter, Garet, Yoon, and Birman (2002) identified six key features or characteristics of professional development in improving teaching practice. The structural features include: design or organization of the activity; duration, including contact hours and span of time; and collective participation of the groups (vs. individuals). The core features include teacher engagement and active learning, coherence with school standards and goals, and content focus (in this review, mathematics and science). Desimone and colleagues concluded that most school-supported professional development projects did not successfully address these six elements.

In this chapter, we first define professional development, introducing what we call "the third wave." We then describe landmark large-scale studies that provide important evidence about the status of professional development, identify features or characteristics of effective professional development, and follow this with a discussion of standards for professional development. Finally, we describe three research-based approaches to professional development—literacy coaching, teacher leadership, and professional learning communities. We close with some major conclusions about the current research and make several recommendations for improving professional development.

WHAT IS PROFESSIONAL DEVELOPMENT?

During recent years, efforts have been made to define and describe effective professional development. For example, in their review of professional development literature, Anders, Hoffman, and Duffy (2000) present a list of six criteria that should be considered when designing professional development initiatives: (1) intensive/extensive commitment, (2) coaching/clinical model, (3) teacher reflection, (4) deliberation, dialogue, and negotiation, (5) voluntary participation, and (6) collaboration.

Then, in 2005, the American Educational Research Association (AERA) published a brief in which two waves of professional development are described. The first wave, beginning in the 1960s, focused on generic teaching skills—that is, helping teachers understand how to group students, hold their attention, allocate instructional time, and so forth. In the 1990s, research was focused on student learning, for example, how students reason and problem-solve. This second wave put the emphasis on content-matter knowledge as important in professional development programs for improving student achievement. In this brief, four important notions about professional development are described: (1) a focus on the subject matter being taught; (2) professional development aligned with teachers' classroom work, using actual materials and assessment tools; (3) sufficient time and extended opportunities to learn; and (4) the importance of evaluating professional development, focusing on both teacher practices and student learning (AERA, 2005).

We propose a third wave, a recognition of the importance of the culture within which teachers work and the need for distributed leadership that helps teachers focus on the goal of improving student learning. Thus we define professional learning as those *experiences that take place within a collaborative culture of shared leadership, that increase educators' knowledge about content and pedagogy and enable them to use that knowledge to improve classroom and school practices that improve student learning.* In other words, although we recognize the importance of professional growth of individual teachers, our primary goal is to discuss professional learning as it affects the collective ability and capacity of teachers in a school to address challenges and solve problems that enable the organization to become more effective in its most important endeavor—improving student learning. Although collaboration in schools has been mentioned in earlier studies (Anders et al. 2000; Bryk et al., 2010; Desimone et al., 2002) as a key feature of effective professional development, an emphasis on systematic approaches to developing such collaborative efforts has intensified in recent years.

PROFESSIONAL DEVELOPMENT: A SUMMARY OF KEY RESEARCH

In this section, we summarize the results of key research findings that provide an update about the status of professional development and criteria important to its success. Three major reports of teacher professional learning opportunities

conducted by Learning Forward and the Stanford Center for Opportunity Policy in Education in the United States have provided substantial information about the status of professional development in the United States. In the first report, Wei, Darling-Hammond, Andree, Richardson, and Orphanos (2009) evaluated the status of professional development in the United States in relation to professional development in other countries. The researchers found that between 2000 and 2004 there was a decrease in the number of learning opportunities that allowed for regular collaboration of teachers (e.g., regularly scheduled collaboration, observations of teaching in other schools). Teachers most often engaged in workshops and conferences (90%) versus coaching (46%) and observations of peers (22%). The report found that teachers desire more professional learning experiences concerning students with disabilities, subject matter/content, classroom management, and use of technology. They indicated that professional development that is disconnected from classroom practice has little impact. Finally, the authors cite the limited pool of rigorous research studies available about professional development (Wei et al., 2009).

In Phase 2 of this research study, Wei, Darling-Hammond, and Adamson (2010) addressed trends and challenges for professional development in the United States. The report, which uses several large datasets, indicated that a great majority of new teachers participate in some type of induction program (75%) and are mentored (80%). Most professional development projects studied focused on learning-specific content. Furthermore, the report states that teachers had fewer opportunities to participate in professional development activities that are sustained over time (e.g., more than 8 hours' duration) and that short-term workshops were still the norm. Last, teachers reported lack of access to professional development that focuses on at-risk learners (e.g., those with disabilities and special needs, English language learners [ELLs]).

In the Phase 3, Jaquith, Mindich, Wei, and Darling-Hammond (2010) provided an in-depth analysis of the policies of four states in which there was active teacher involvement in professional development and student achievement was improving. According to this report, state policies and systems are key to improving professional development for teachers. Specific features of state involvement include: standards for professional development; accountability and monitoring of professional development efforts; various intermediary offices that provide the infrastructure and support for professional development in districts; and resources that schools and districts can use to enhance professional development efforts.

Although these three reports provide important information about trends and challenges overall, only a few studies have focused specifically on the relationship between professional development and teacher practices or student achievement. Yoon, Duncan, Lee, Scarloss, and Shapley's (2007) synthesis of studies was an attempt to determine how professional development affects student achievement. Their sample size of more than 1,300 studies was reduced to 9 after applying evidence standards from the What Works Clearinghouse. All nine studies were situated in elementary schools and addressed reading, language arts, math, or science.

All studies had positive student outcomes and shared similarities in design elements; for example, professional development generally consisted of a workshop format. Similarities of these workshops included implementation of research-based instructional practices, an active learning component, and opportunities for teachers to adapt to meet the needs of the learners in their classrooms. Furthermore, the studies that showed positive student outcomes were also led by outside experts and were not in-house or site-based. These experts not only presented information to the teachers but also facilitated the implementation. The analysis also indicated that initiatives reviewed consisted of at least 30 contact hours and did include a significant amount of follow-up that was job-embedded and specific to the teachers' classrooms. Again, many of the features identified by others (Anders et al., 2000; Darling-Hammond et al., 2009; Desimone et al., 2002) were integral parts of the studies described by Yoon and colleagues (2007).

Blank and de las Alas (2009) also investigated the effects of teacher professional development (K–12) on student achievement in math and science and, in addition, identified the characteristics of professional development that best explained the degree of effectiveness. Their meta-analysis of 16 studies that met their established criteria revealed modest effects between professional development and student achievement in mathematics from the professional development program (12 of 16 studies focused on math). Features that were common across studies included strong focus on specific subject and pedagogical content and follow-up support, such as coaching, mentoring, networking, and so forth, that often included support for mentors and colleagues in their schools. Given that the individual studies in this investigation included both school-level work and studies for which individual teachers enrolled or volunteered, there was mixed evidence of the importance of teachers' collective participation.

In the most recent *Handbook of Reading Research*, Dillon, O'Brien, Sato, and Kelly (2011) discuss the research in professional development and teacher education for reading instruction. Although the primary focus of the chapter is preservice education, they do cite the need for additional professional development studies that examine direct observation of changes in classroom practices and student outcomes. They highlight literacy coaching as an important professional development model, although they also indicate that the effects of coaching on changing teacher practices or on student learning remains limited. They also emphasize the need for more longitudinal work, studying teacher practices for several years beyond the first year. They recommend formative experimental research, suggesting that new technologies will enable researchers to study geographically mobile teachers at multiple points in time.

In sum, the recent research has validated the importance of features such as focused content, active learning, duration, and ongoing support. But, in addition, it has emphasized a new feature, that of collaborative learning—that is, the importance of the organization in which the teacher works. Thus the "third wave" does not negate features identified as important; rather, the third wave adds another dimension that can be helpful in building capacity and ultimately improving student learning in the school. In other words, it is difficult to separate the various

features that are necessary in any effective professional learning program; rather, effective professional development would encompass as many of those features as appropriate for a specific professional development initiative.
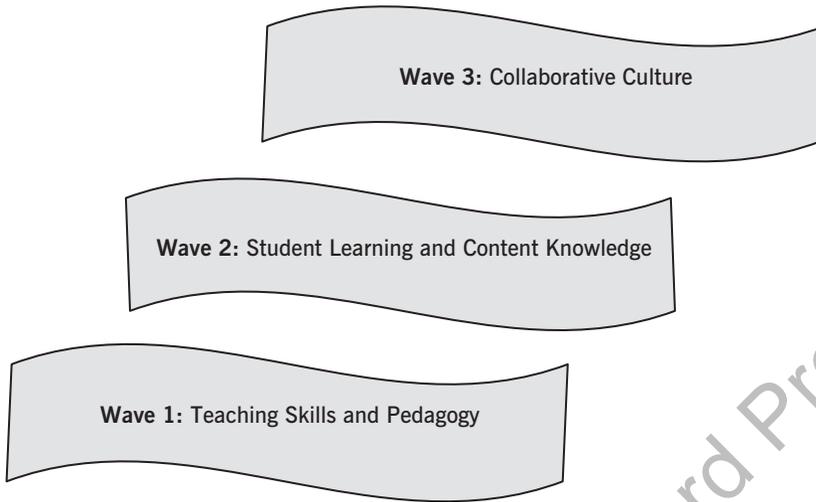
STANDARDS FOR PROFESSIONAL DEVELOPMENT

In the publication *Standards for Staff Development* (2001), the National Staff Development Council (NSDC) identified three important elements of effective professional development: content, context, and process. These standards were influential in helping educators, as well as researchers, think about features such as the content being addressed, the characteristics of the teachers, students, and schools in which the professional development was being offered, and the activities that would help ensure active engagement on the part of the participants. In 2011, Learning Forward (previously known as NSDC) released its new *Standards for Professional Learning*, which provided a more analytical overview for educators. Learning Forward made the decision to use the phrase "professional learning" rather than "professional development" to signal an increased emphasis on educators taking an active role in their own learning. The standards now include seven dimensions: learning communities, leadership, resources, data, learning design, implementation, and outcomes (*www.learningforward.org*). Learning Forward also indicates that professional learning by itself will not address all challenges that educators face and identifies four prerequisites for effective professional learning: (1) educators' commitment to all students; (2) educators' receptivity to professional learning; (3) importance of collaborative inquiry to enhance both individual and collective performance; and (4) respecting the difference in educators' learning needs. These standards, as well as those of other professional organizations, such as the International Reading Association (2010), the Council for Exceptional Children (2009), the American Speech–Language–Hearing Association (2010), and the Interstate Teacher Assessment and Support Consortium (2011), can be helpful for designing policies and shaping practice for professional learning and for evaluating the effectiveness of these efforts.

RESEARCH-BASED PRACTICES FOR PROFESSIONAL DEVELOPMENT

We begin with a discussion about what is called the "third wave," building on the two-wave model described by the AERA (2005). The third wave focuses on the importance of the culture of the organization as an important ingredient in effective professional development initiatives (see Figure 3.1). Then we describe three approaches to professional development that, based on research, include many of the features described earlier and also build capacity in the school by promoting collaboration, teacher leadership, and shared decision making.

Improvement in overall student learning requires collective participation and collaboration among all educators in the school. Such participation means that

FIGURE 3.1. Waves of professional development.

there is shared leadership in the building by which all educators have a role in facili-
tating literacy learning. In other words, the culture of the organization is impor-
tant. Although Joyce and Showers (2002), for example, continue to emphasize ideas
found in previous editions of their book *Student Achievement Through Staff Devel-
opment* (e.g., coaching), in the present edition, there is even more emphasis on the
importance of the organizational infrastructure, the need to create communities
in districts and schools, and the role of leadership. Joyce and Showers state that
educators involved in a staff development effort must function as a community of
professionals who study together, apply what they are learning, and share results.

     Evidence from both the educational field (Bryk et al., 2010; Marzano, 2003)
and the corporate world (Collins, 2001) speaks to the impact that the culture in an
organization has on those who work there and on its ultimate success. Specifically,
what matters is how the members of that organization interact with one another,
that is, the collegiality among members (Marzano, 2003). As cautioned by Fullan
and Hargreaves (1996), however, such collegiality does not come about by mandate
(e.g., that teachers *will* meet and plan together, that they are *required* to coach each
other). Furthermore, collaboration does not mean that teachers interact socially;
rather, the conversations among teachers must be focused on improving instruction
in the classrooms. Too often, there are structural changes that provide opportuni-
ties for teacher conversations, but there is little that helps teachers understand how
to work meaningfully with others.

     Leana and Pil (2006) provide solid evidence about the importance of school
culture or climate. In their study of a large urban district, they distributed ques-
tionnaires to teachers in many of the schools—elementary through high school—
and analyzed the relationship between teacher responses and student achievement.
What they found was that having a trusting climate in the school, that is, strong

social capital, was more important in predicting student achievement scores than other factors such as teacher experience or certification, generally known as human capital. Moreover, the patterns of responses were similar, regardless of level or type of school. In schools that exhibit strong social capital, "teachers talked to each other, shared the same norms, and had strong agreement in their descriptions of the culture of the school" (Leana, 2010, p. 18). In a later study of social capital in New York City schools, they asked teachers to identify the colleagues with whom they talked if they were having difficulties. Most often (a ratio of 2:1), teachers reported that they talked to their peers. As Leana (2010) stated, "They don't talk to experts. They don't talk to the coaches. They don't talk to the principal....they talk to one another" (p. 19). Leana does not negate the importance of human capital, the capacity and ability of teachers, but indicates that social and human capital are "inextricably intertwined" (p. 19). One must have both to have good classrooms and a good school. She makes a plea for recognizing the collective efforts of teachers, one that recognizes that teachers in a school have a shared destiny and a shared purpose.

The following three research-based approaches show promise in that they include many features found to be essential in effective professional development programs, including the importance of a collaborative culture. What is even more promising is that all three of these can be incorporated into a school professional learning plan–that is, a school can employ coaches to help lead professional learning communities. Such a school can also draw on the resources of its teachers to serve as instructional leaders. These three approaches all address both social and human capital/capacity. They involve teachers, what they know, who they are, and how they function with others (not in isolation as door closers) as a critical variable in the design of the approach. Moreover, any one of these, to be successful, requires an organizational structure in which there is a common vision and common goals and in which teachers work collaboratively to achieve those goals.

Coaching

Coaching is a good example of a key approach that has multiple feature of effective professional development in that it requires adequate time or duration and activities that build knowledge and theory and in that it provides for ongoing support and feedback. Moreover, it operates more effectively when teachers are receptive or ready for coaching; that is, when they recognize the importance of learning from others and trust the coach to work with them in a supportive, collegial fashion. Coaching frequently requires working with teachers in collaborative groups (e.g., analyzing data, lesson study, study groups) (Bean & Swan Dagen, 2012). Such activities can be most effective when the climate is one in which teachers share a common vision and have common goals for student learning (Vescio, Ross, & Adams, 2008).

A study by Biancarosa, Bryk, and Dexter (2010) provides an excellent example of an extended professional learning program, based on a train-the-trainer model, that builds knowledge of participants and provides for ongoing support and feedback over an extended period of time. The study was conducted in 17 schools with

second-grade students who were assessed with the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and the TerraNova test. Literacy Collaborative, a school reform program designed to improve students' reading, writing, and language skills, provides a graduate-level program for literacy coaches selected by their schools; coaches at the same time are teaching students at their schools. The program includes theory, content, and pedagogical knowledge about how to teach literacy, as well as how to work with teachers through site-based professional development and coaching. After the initial year, coaches spend half of their time working with teachers in their schools and also continue to teach students for the remainder of the time. The coaches during this second year facilitate a 40-hour course for their teachers and also work with their peers one-on-one, modeling, observing, and in general supporting teachers in their implementation efforts. The authors used an accelerated longitudinal cohort design to determine effects of the program on student learning. Results indicate significant gains in student literacy learning beginning in the first year of implementation, with larger gains during each subsequent year of implementation (Biancarosa et al., 2010, p. 27). Biancarosa and colleagues hypothesize that the increase in effects over time may speak to the fact that coaches may need several years to grow into their position and, in addition, to establish the relationships with teachers that enable them to work well together.

Neuman and Cunningham (2009) conducted a study in which they provided professional development intervention to early childhood educators; participants were randomly selected for one of three groups, including (1) coursework at a local community college, (2) coursework plus weekly coaching, and (3) a control group. These researchers found that professional development plus coaching was related to significant increases in teacher knowledge and practice; coursework alone had no effects, and results in this group were similar to those in the control group. Neuman and Wright (2010) conducted a study in an effort to examine the effects of coaching *or* coursework on the language and literacy teaching practices of prekindergarten teachers. In this study, 148 teachers from six urban cities were randomly assigned to one of three groups: a coursework-only group, an onsite coaching group, or a control group. Participants in group 1 attended a 30-hour program, whereas those in group 2 received onsite individualized coaching and those in group 3 received no professional development. Results indicated no significant gains between groups on their knowledge of early language and literacy. In other words, neither treatment condition appeared to improve teacher knowledge of early language and literacy. However, those in group 2, the coaching group, made statistically significant improvements in the literacy environment in their classrooms, as determined with the Early Language and Literacy Classroom Observation (ELLCO; Smith & Dickinson, 2002), an observational tool that assesses the environment and literacy activities. Although participants in group 1 appreciated the course they attended, they had difficulty transferring what they were learning to their classrooms, with some indicating that the literacy demands were too high and concepts too abstract. According to the authors, the results indicate that coursework may need to be adapted to meet the needs of adult learners and that coaching promotes application to practice. Coaching gave these teachers the ongoing support they needed

to implement important language and literacy practices in their own classrooms with their own students. Several limitations of this study are discussed: There was no measure of the effect of teacher learning on student learning, the professional development was developed and conducted by an external group, and participants were volunteers.

Matsumura, Garnier, Correnti, Junker, and Bickel (2010) summarize the results of a longitudinal randomized field trial of a literacy coaching program with 73 fourth- and fifth-grade teachers in 32 elementary schools with high teacher mobility. The 73 teachers were recruited midway through the program's implementation as replacements for teachers who had left their school or grade. The focus of the literacy initiative was effective reading comprehension, based on Questioning the Author (QtA), developed by Beck and McKeown (2006) as an approach for supporting meaningful discussions to promote and deepen reading comprehension. Professional development was provided for coaches; they studied the QtA framework, saw trainers model the approach, and were then given opportunities to practice teaching QtA lessons and provided with feedback. They also observed other coaches teaching such lessons. In addition, coaches had opportunities to build their coaching skills using notions of content-focused coaching (CFC; West & Staub, 2003).

Coaches then met with teachers to discuss the theories underlying effective reading comprehension and to help them plan QtA lessons. These coaches then met with teachers individually to help them implement QtA in their classrooms. Results indicated that there was an increase in participation in coaching for the CFC teachers relative to teachers in comparison schools, and more of the CFC teachers viewed their coaching experience as useful; however, few teachers participated in coaching at the level expected by program developers. Researchers also found significant average gains on the state test for the CFC schools, with ELLs scoring higher than ELLs in the comparison schools. There was not a significant effect for all students, although the trend was in a positive direction for the CFC schools. Matsumura and colleagues (2010) suggest that the fact that the coaching program was an established one—that is, that coaches had experience with the reform initiative and with coaching techniques—was a key factor in their ability to work with teachers new to the school and also had a positive effect on the student results.

In each of the preceding studies, there is a specific framework for instruction, based on theory and research in the field—in these cases, literacy instruction—and there are also opportunities for support of teachers as they attempt to implement these new instructional practices. In all these instances, the reform initiative is one that has been developed by an external agent or agency and, in addition, built on researched practices. Yet not all evidence about coaching as a follow-up approach to any instructional change effort is positive.

Walpole and McKenna (2009) discuss the fact that there is "mixed" evidence about coaching as a tool for changing teacher practices. They cite the results of the Garet and colleagues (2008) study, in which there were three treatments: professional development only, professional development plus coaching, and a control group. Specifically, teachers in both treatment groups scored higher than the control group on knowledge measures, and there was no difference between

the professional development-only and professional development-plus-coaching groups. Furthermore, there were no effects on student achievement. Yet Walpole and McKenna indicate that coaching still provides one of the important options for the future and cite the need for studies that address more specifically the various nuances of coaching. According to these authors, researchers must develop studies that recognize the multifaceted dimensions of coaching, including differences in the coach, what the coach does, and the context in which coaching occurs. In other words, coaching is not a "monolithic" construct (p. 31). They in fact provide their own definition of coaching, "a strategy for implementing a professional support system for teachers, a system that includes research or theory, demonstration, practice, and feedback" (McKenna & Walpole, 2008, p. 1). In other words, again, the professional development includes the development of knowledge based on theory, opportunities for modeling, practicing, and feedback. The researchers also identify questions important for both those interested in implementing coaching as an integral part of professional development and those involved in studying coaching:

1. How do models of coaching direct coaching efforts?
2. To what extent are coaching efforts mediated by characteristics of districts and schools?
3. How can coaches work with administrators to optimize their efforts?
4. How can coaching be differentiated to meet the needs of all teachers?
5. What personal characteristics tend to be shared by effective coaches? (McKenna & Walpole, 2008, p. 26)

Although coaching has shown great promise, coaching positions are often eliminated when schools face budget difficulties. Therefore, there have been efforts to investigate technology as a means of providing cost-efficient and effective coaching. Gentry, Denton, and Kurz (2008), for example, synthesized peer-reviewed studies on technology-mediated mentoring for teachers and found that teachers were positive about their experiences; however, they indicated that there was a need for more rigorous research on this type of coaching.

In sum, there is increasing evidence that coaching includes specific elements known to be important aspects of effective professional development: adequate time; opportunities to develop knowledge, both content and pedagogical content; and follow-up activities that help teachers understand how to implement effectively what they are learning. In addition, coaching appears to be most effective when it operates in a context that provides for the support of coaches and coaching and recognizes the importance of coaches as instructional leaders who can work collegially with teachers.

Teacher Leadership

York-Barr and Duke (2004) define teacher leadership as "the process by which teachers, individuals or collectively, influence their colleagues, principals, and other members of school communities to improve teaching and learning practices with

the aim of increased student learning and achievement" (pp. 287–288). Commonalities among descriptions of school-based teacher leaders include educators who:

- Influence peers and school community through collegial interactions (Danielson, 1998; Fullan & Hargreaves, 1996; Lambert, 2003);
- Work in classrooms and the overall school system (Katzenmeyer & Moller, 2009);
- Concentrate their efforts on school improvement, specifically student growth and achievement (Crowther, Ferguson & Hann, 2009; Donaldson, 2006; York-Barr & Duke, 2004); and
- Engage in formal and informal leadership responsibilities (Danielson, 2007).

This overview of teacher leadership is congruent with research on distributed leadership, which Spillane (2005) defines as "a system of practice comprised of a collection of interacting components: leaders, followers and situation" (p. 150). That is, distributed leadership is *stretched* across various personnel (principal, teachers, and specialists) within a school. The distributed notion reflects teacher leadership as an organizational element within a school.

There is a strong link between professional development and teacher leadership (Poekert, 2012), one in which the culture or organization is a vital backdrop for professional learning. Teacher leadership can be developed as a form of ongoing professional development, and in many schools teacher leaders are responsible for planning and implementing professional development (Swan Dagen & Nichols, 2012). Teacher leaders plan and facilitate these experiences but are also colearners in the process. So not only do they learn content, but they also grow professionally from their leadership experience. Therefore, professional development is "both a cause and an outcome of teacher leadership" (Poekert, 2012, p. 170). In this model, teacher leadership takes the form of job-embedded professional development.

Professional development/professional learning is just one of seven domains presented in the Teacher Leader Model Standards (TLMS) developed and released by the Teacher Leadership Exploratory Consortium (2011). The purpose of the standards is to "stimulate dialogue" about what constitutes the knowledge, skills, and competencies that teachers need to assume leadership roles. Domain 3, "promoting professional learning for continuous improvement," addresses job-embedded professional development aligned with school improvement goals. The standards indicate that teacher leaders should collaborate with peers and administrators; be knowledgeable about adult learning theories; facilitate peers' learning; use technology to promote learning; collect, analyze, and disseminate data on the effects of professional learning; advocate for time and support for job-embedded professional development; provide feedback; and remain current on emerging trends in education.

As highlighted in the TLMS standards, collaborating with peers is a critical element of teacher leadership, as it seems to improve teaching (Sparks, 2004), Teachers who work in isolation rarely change their practice (Greenwood & Maheady, 2001). Furthermore, Fuchs and Fuchs (2001) assert that classroom teaching becomes

more effective when peers and administrators collaborate and use student data as a backdrop to their decision making and planning. Collaboration is a key function of teacher leaders. Collaboration, as a form of teacher leadership, can transform schools as places of learning (Bean & Swan Dagen, 2012). This transformation, however, takes time and cannot be mandated or required for authentic learning and growth to occur. However, not all activities that take place between peers in schools can or should be labeled collaboration.

Little (1990) describes three layers of collaboration that are low intensity–low risk; they include: (1) collegiality through storytelling, which is mainly anecdote-based; (2) responding to peers' requests for help and assistance (when asked); and (3) material, idea, and strategy sharing. Authentic collaboration, which Little calls "joint work," is the most effective form of collaboration and includes activities such as team teaching, planning, observing, mentoring, and action research. For this type of high-level collaboration to be successful, the following school variables need to be considered: active support from principal and colleagues, available time and resources within the school schedule, and authentic opportunities to collaborate (York-Barr & Duke, 2004). Only when these elements are in place do schools have the potential to develop into places for professional/adult learning.

The *MetLife Survey of the American Teacher: Collaborating for Student Success* (2010) addressed collaboration opportunities of U.S. teachers. They reported that participating teachers on average spent 2.7 hours a week collaborating. These collaborating activities consisted mainly of team meetings or as participants in student-centered meetings. On the other hand, in the technical report called *Professional Learning in the Learning Profession*, Wei and colleagues (2009) reported on teachers in parts of Europe and Asia who have less direct contact with students and who spend more time planning and collaborating with peers. The authors report that in some instances these two activities are equal in duration (e.g., 15–20 hours teaching, 15–20 hours collaborating). Examples of collaborating activities include coplanning lessons, observing peers, evaluating student assessment and progress, developing curriculum, and participating in study groups.

Many have conducted research and published articles on such topics as how schools find time for teacher collaboration (Dearman & Alber, 2005), cultivating a culture by creating opportunities for teachers to pursue collaborative leadership (Mongiello, Brady, Johnson, & Berg, 2009), designing comprehensive professional development plans highlighting teacher collaboration (Kennedy & Shiel, 2010), and strategies to get teachers involved in collaborative efforts (Allen, 2006). However, very few empirical studies currently exist on the relationship between teacher leadership and its impact on teacher or student learning.

Colbert, Brown, Choi, and Thomas (2008) present the results of research studying the changes teachers made when they were given autonomy, responsibility, and funding to work with peers and select, plan, design, and implement their own professional development experiences. Teams of these teachers were solicited to apply for a $30,000 professional development budget to be used for a 2-year cycle. The teams were required to examine their own needs for professional development, and options for professional development activities included travel to conferences,

coursework, implementing and evaluating curriculum, and bringing in experts from the field into schools and classrooms. All teachers (100%) reported moderate to major benefits—empowerment, efficacy, self-confidence, and professionalism; 96% felt that participation had a moderate to major impact on their subject matter knowledge; 100% reported that participation had a moderate to major impact on their feelings of self-efficacy; 96% felt that they were engaged in a moderate to major amount of teamwork; and 83% reported the project had resulted in improving student learning. Through in-depth interviews, the researchers learned about the reflective experiences of a team of teachers from a Los Angeles elementary school. These teachers focused their professional development on nonfiction writing and decided to attend a workshop at New York's Teachers College. Once there, the team of California teachers met a second group of teachers, from New York, who were also attending the workshop. However, unlike the team of teachers who selected this opportunity, the New York group was disheartened about attending because the content did not match their professional needs. The California teachers felt that designing their own professional development experiences had resulted in a meaningful experience. One of the limitations of this study was that it did not address the effects on actual classroom practices or student achievement; rather, data were obtained using teacher self-perceptions.

Lieberman and Wood (2002) shared their research about the National Writing Project (NWP), one of the most successful teacher networks in the United States. The NWP project, which began in 1974, currently oversees nearly 200 university-based sites in all 50 states. Teachers participate in summer institutes and then continue collaborative work throughout the school year. Lieberman and Wood studied two NWP implementation sites in two states from 1997 to 1999. Through site visits, document analysis, interviews, focus groups, and classroom observations, they identified two key features responsible for the success of this project: (1) group social practices that build community and (2) ongoing networks (of teachers) in which relationships are supported and sustained. Lieberman and Wood identified the critical social practices that resulted in transformations in the NWP participants: treating everyone as a contributor; teaching other teachers; sharing, discussing, and critiquing in a public forum; turning ownership over to the learners; situating learning in practice and relationships; providing multiple entry points into learning communities; reflecting on teaching by reflecting on learning; sharing leadership; adopting a stance of inquiry; and rethinking professional identity and linking it to professional community. Also, Lieberman and Wood followed six teachers at various points in their careers and found that participation had had an impact on their teaching practices.

Hunzicker (2012) studied teachers who assumed informal leadership roles in their schools. The participants in this multiple case study were eight elementary teachers who were enrolled in a science, technology, engineering, and math (STEM) master's program. In this program teachers completed coursework, action research projects, and a teacher leadership portfolio. Self-reported data were collected for this multiyear project through focus groups, questionnaires, and narrative reflections. Hunzicker concluded that there were three project variables that

cultivated leadership: exposure to research-based practices (e.g., action research tied to coursework and school initiatives); increased self-efficacy (e.g., through student-centered instructional approaches such as data-driven decision making); and serving beyond the classroom (e.g., leading professional development, collaborative decision making). Through the project, aimed at improving teaching, teachers gradually developed leadership capacity. Effective professional development paired with job-embedded collaboration helped nurture these teachers into leaders. Exposure to these high-quality project experiences took place within the context of the project, and the teacher leadership skills of the eight teachers grew gradually over time.

In sum, developing teacher leaders requires time, administrative support, and authentic opportunities that focus on a teacher's work in school. Although leadership abilities can be innate or developed by an individual teacher, fulfilling the potential in this role requires a supportive collaborative school culture. The research evidence to this point has generally been based on self-report and focused on teacher responses or reactions to their experiences.

Professional Learning Communities

One of the prominent approaches to enhancing collaboration is the notion of developing a school as a professional learning community (PLC). But what is a professional learning community, and what evidence is there that the existence of such a community makes a difference in teacher practice and student learning?

Defining a PLC is not easy; various terms have been used to describe such initiatives— for example, "critical friends," "community of practice," and "community of learners." However, the five characteristics identified by Newmann and his colleagues (1996) are helpful in thinking about essential components of any PLC; these include (1) shared values and norms; (2) a focus on student learning rather than teaching; (3) opportunities for reflective dialogue; (4) collaboration as the norm; and (5) teaching made public. Too often, the term "professional learning community" is used to describe an organizational culture in which only one or two of these components exist (e.g., teachers have opportunities to collaborate). As cautioned by DuFour (2004), however, just labeling one's school as a PLC is not enough. For example, teachers can be given opportunities to meet frequently, but unless those meetings are focused on student learning, unless they provide opportunities for reflection, and so forth, they do not meet the criterion that defines a PLC.

What evidence exists about the value of professional learning communities for teacher practice and student learning? One of the key studies is that of Vescio and colleagues (2008), who reviewed 11 studies, published and/or peer reviewed, that provided empirical evidence about the effectiveness of PLCs. Their goal was to focus on these 11 studies rather than on the many others available that highlighted the self-perceptions of teachers who appeared to value such initiatives. Vescio and colleagues found that in organizations with well-developed PLCs, there was a positive impact on classroom practices and student learning. They were able to identify the following as essential characteristics of the PLCs in their reviewed studies: (1)

collaboration, which includes opportunity for reflection and open dialogue about teaching practices; (2) an emphasis on student learning; (3) teacher decision making, or what they called teacher authority; and (4) opportunities for continuous teacher learning. They also indicated that, although some of the studies did not identify specific changes in teacher practices, they did provide evidence of changes in the professional culture of the school. Vescio and colleagues call for more rigorous research to help educators understand exactly what it means to implement PLCs in schools in ways that enhance student learning.

A 5-year quasi-experimental study conducted by Saunders, Goldenberg, and Gallimore (2009) also supports the importance of teamwork as a means of improving student achievement. Saunders and colleagues compared two groups of schools, nine in which grade-level teams were given time to work collaboratively using protocols to think about student learning, and a matched group of six schools. During the first 2 years (Phase 1), they provided training to principals only, and during the final 3 years (Phase 2), training was provided for both principals and teacher leaders. In addition, the researchers provided explicit protocols for the grade-level meetings during Phase 2. These researchers found no differences in achievement between the two groups of schools in Phase 1, but achievement at the experimental schools improved at a faster rate and showed greater growth during Phase 2. Saunders and colleagues indicate that the addition of schoolwide leadership and structured support—that is, providing specific and explicit protocols focusing on meeting students' learning needs—were essential in building effective teacher teams. They conclude that time to learn to work collaboratively and structured support, in this case from external collaborators, are key elements leading to changes in student learning. They state, "time for collaboration itself, even when administratively supported, is unlikely to improve achievement unless additional conditions are in place that structure its use" (p. 1028). Saunders and colleagues indicate that the nine schools in the study were volunteers and that there is a need for evidence about whether such collaborative work will be successful if mandated by a district or school. They also highlight difficulties that schools might face because of multiple and competing initiatives.

The Saunders and colleagues (2009) study reflects some of the findings of Wood (2007), who analyzes one district's efforts to institute learning communities in its schools. She found that although there were many successes, there were also many difficulties, and district support and leadership is needed if such an initiative is to succeed. In this case study report, Wood, an outside researcher, collected data, including interviews, focus groups, observations, and surveys, over a 2½-year period from educators in an urban district struggling with changing demographics and an achievement gap between middle class and poor students. With support from a foundation, and using a professional development design of the National School Reform Faculty (NRF), the superintendent of the district began her efforts to establish learning communities in five district schools, including three elementary schools, one middle school, and one high school. Wood identifies several factors that limited the effectiveness of learning communities as a means of building capacity. First, many teachers failed to see a connection between their collaborative

work and student learning; that is, they enjoyed the community-building efforts, using protocols in group work, but did not delve deeply enough to engage in critical inquiry focused on improving teaching practices. There was also tension created by high-stakes accountability policies that competed with the agendas developed by those leading learning community efforts. Moreover, other curricular or assessment demands, especially those that came from the district, that forced changes in the agendas of the learning communities led participants to question the purpose of these communities. Wood concludes that for learning communities to be effective, "districts must invest greater authority and autonomy in participants as well as adequate time and support" (p. 2).

In sum, although the notion of "professional learning communities" seems to have the potential for changing school culture, teaching practices, and student learning, there is a need for more research about how such initiatives can be successfully established in schools, specifically, what conditions need to exist if they are to be effective. What is clear is that professional learning communities are not a "quick fix" but that establishing them in schools requires structured experiences, a long duration, and effective shared leadership.

CONCLUSIONS

Our work has led us to draw four key points about professional development in the schools.

1. We know a great deal about professional development and have substantial evidence that the most effective professional learning occurs when it is job-embedded, that is, when it relates to what teachers are doing in their classrooms and helps them to understand in more depth the subject they are teaching. Such professional development respects teachers as active learners who recognize the need for ongoing learning for improving instructional practices.

2. Professional development is a journey, not a single event, and it is based on the belief that effective teaching can occur only when there are opportunities for ongoing and active learning. Such professional development calls for teachers who understand and value the opportunity to continue to learn; at the same time, it highlights the need for professional development that is focused on the needs and goals of the schools. Therefore, it requires that school professional development initiatives should be focused and enable teachers to study in depth what they are learning. Too often, the multiple initiatives of schools create confusion and limit teachers' ability to implement with integrity what they are learning.

3. Enabling teachers to actualize what they are learning—that is, to use it in the classrooms—requires ongoing support and feedback, often through coaching or mentoring. Peers can also provide such support informally as they help each other understand the initiative being undertaken.

4. Professional development can be more effective if it occurs in a collaborative culture that emphasizes the importance of teacher as learner and schools as places of learning for both students and teachers.

RECOMMENDATIONS AND FUTURE DIRECTIONS

• There is still much to learn about what type of professional learning works best for whom and in what conditions. We need more information about coaching, how it may differ at elementary versus secondary levels, how structured it should be, and so forth. We also need additional information about the ways that technology can be helpful in promoting teacher learning in a cost-efficient and effective manner.

• We must continue to evaluate the professional development efforts that occur in schools. Although funded projects often require an evaluation component, schools and/or districts that implement professional development initiatives should also consider ways that they can evaluate the impact of these efforts. Such evaluative efforts can provide the information that schools need to better guide their school change or reform efforts; moreover, it will help them answer questions of accountability often asked of school personnel. Guskey's (2000) five-level model for evaluating professional development can be a helpful tool for those responsible for evaluation efforts. The model is one that is arranged hierarchically, from simple to more complex, and generally success at one level is necessary for success at the following levels. The five critical levels include: participants' reactions, participants' learning, organizational support and change, participants' use of new knowledge and skills, and student learning outcomes.

• There is a need for more rigorous and empirical research about professional development. Such research should address significant questions about the impact of professional development models on teacher practices and student learning. Longitudinal research on changes over time can provide important information about the impact of professional development.

QUESTIONS FOR DISCUSSION

1. How do the standards for student learning, developed at the state or district level, influence the professional learning experiences of teachers in a school? What supports are necessary from the state or district to enhance such professional development?

2. The chapter describes three specific research-based collaborative strategies for professional development. Which model(s) would be a "best fit" for the school where you work? What would be the barriers to implementation?

3. The theme of collaboration is highlighted throughout this chapter. What are the barriers to such collaboration in your school and how might you address them?

REFERENCES

Allen, J. (2006). *Becoming a literacy leader.* Portland, ME: Stenhouse.

American Educational Research Association. (2005). Teaching teachers: Professional development to improve student achievement. Retrieved from *www.aera.net/Publications/ ResearchPoints/tabid/10234.*

American Speech–Language–Hearing Association. (2010). Roles and responsibilities of speech–language pathologists in schools. Retrieved from *www.asha.org/policy/ PI2010-00317.*

Anders, P., Hoffman, J., & Duffy, G. (2000). Teaching teachers to teach reading: Paradigm shifts, persistent problems, and challenges. In M. Kamil, P. Mosenthal, P. D. Pearson, & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 721-744). Mahwah, NJ: Erlbaum.

Barber, M., & Mourshed, M. (2007). *How the world's best-performing school systems come out on top.* London: McKinsey.

Bean, R. M., & Swan Dagen, A. (2012). Schools as places of learning: The powerful role of literacy leaders. In R. M. Bean & A. Swan Dagen (Eds.), *Best practices of literacy leaders: Keys to school improvement* (pp. 355–378). New York: Guilford Press.

Beck, I. L., & McKeown, M. G. (2006). *Improving comprehension with Questioning the Author: A fresh and expanded view of a powerful approach.* New York: Scholastic.

Biancarosa, G., Bryk, A. S., & Dexter, E. (2010). Assessing the value-added effects of Literacy Collaborative professional development on student learning. *Elementary School Journal, 111*(1), 7–34.

Blank, R. K., & de las Alas, N. (2009, June). *Effects of teacher professional development on gains in student achievement: How meta-analysis provides scientific evidence useful to education leaders.* Washington, DC: Council of Chief State School Officers.

Bryk, A. S., Sebring, P. B., Allensworth, E., Luppescu, S., & Easton, J. Q. (2010). *Organizing schools for improvement: Lessons from Chicago.* Chicago: University of Chicago.

Colbert, J., Brown, R., Choi, S., & Thomas, S. (2008). An investigation of the impacts of teacher-driven professional development on pedagogy and student learning. *Teacher Education Quarterly, 35*(2), 135–154.

Collins, J. (2001). *Good to great: Why some companies make the leap…and others don't.* New York: HarperCollins.

Council for Exceptional Children. (2009). *What every special educator must know: Ethics, standards, and guidelines for special education.* Arlington, VA: Author.

Crowther, F., Ferguson, M., & Hann, L. (2009). *Developing teacher leaders: How teacher leadership enhances school success* (2nd ed.). Thousand Oaks, CA: Corwin Press.

Danielson, C. (1998). *Teacher leadership that strengthens professional practice.* Alexandria, VA: ASCD.

Danielson, C. (2007). The many faces of leadership. *Educational Leadership, 65*(1), 14–19.

Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad.* Palo Alto, CA: Stanford University.

Dearman, C., & Alber, S. (2005). The challenging face of education: Teachers cope with

challenges through collaboration and reflective study. *Reading Teacher*, *58*(7), 634–639.

Desimone, L., Porter, A. C., Garet, M., Yoon, K. S., & Birman, B. (2002). Effects of professional development on teachers' instruction: Results from a three-year study. *Educational Evaluation and Policy Analysis*, *24*(2), 81–112.

Dillon, D. R., O'Brien, D. G., Sato, M., & Kelly, C. M. (2011). Professional development and teacher education for reading instruction. In M. Kamil, D. Pearson, E. Birr Moje, & P. Afflerbach (Eds.), *Handbook of reading research* (pp. 629–660). New York: Routledge.

Donaldson, G., (2006). *Cultivating leadership in schools: Connecting people, purpose, and practice.* New York: Teachers College Press.

DuFour, R. (2004). What is a professional learning community? *Educational Leadership*, *61*(8), 6–11.

Fuchs, D., & Fuchs, L. (2001). One blueprint for bridging the gap: Project practice. *Teacher Education and Special Education*, *24*, 304–314.

Fullan, M., & Hargreaves, A. (1996). *What's worth fighting for in your school?* (2nd ed.). New York: Teachers College Press.

Garet, M. S., Cronen, S., Eaton, M., Kurki, A., Ludwig, M., Jones, W., et al. (2008). *The impact of two professional development interventions on early reading instruction and achievement* (NCEE 2008-4030). Washington, DC: National Center for Educational Evaluation and Regional Assistance, Institute of Education Sciences.

Gentry, L. B., Denton, C. A., & Kurz, T. (2008).Technologically-based mentoring provided to teachers: A synthesis of the literature. *Journal of Technology and Teacher Education*, *16*(3), 339–373.

Greenwood, C., & Maheady, L. (2001). Are future teachers aware of the gap between research and practice and what should they know? *Teacher Education and Special Education*, *24*, 333–347.

Guskey, T. (2000). *Evaluating professional development*. Thousand Oaks, CA: Corwin Press.

Hunzicker, J. (2012). Professional development and job-embedded collaboration: How teachers learn to exercise leadership. *Professional Development in Education*, *38*(2), 267–289.

International Reading Association. (2010). *Standards for reading professionals: A reference for the preparation of educators in the United States*. Newark, DE: International Reading Association.

Interstate Teacher Assessment and Support Consortium. (2011). *Model core teaching standards*. Washington, DC: Council of Chief State School Officers. Retrieved from *www.ccsso.org*.

Jaquith, A., Mindich, D., Wei, R. C., & Darling-Hammond, L. (2010). *Teacher professional learning in the U.S.: Case studies of state policies and strategies: Summary report*. Dallas, TX: Learning Forward and Stanford University. Retrieved from *www.learningforward.org*.

Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Alexandria, VA: ASCD.

Katzenmeyer, M., & Moller, G. (2009). *Awaking the sleeping giant: Helping teachers develop as leaders* (3rd ed.). Thousand Oaks, CA: Corwin Press.

Kennedy, E., & Shiel, G. (2010). Raising literacy levels with collaborative on-site professional development in an urban disadvantaged school. *Reading Teacher*, *63*(5), 372–383.

Lambert, L. (2003). *Leadership capacity for lasting school improvement*. Alexandria, VA: ASCD.

Leana, C. (2010). Social capital: The collective component of teaching quality. *Voices in Urban Education*, *27*, 16–23.

Leana, C., & Pil, F. K. (2006). Social capital and organizational performance. *Organization Science*, *17*(3), 353–366.

Learning Forward. (2011). Standards for professional learning. Retrieved from *www.learningforward.org/standards#.UlQkcvvD85v.*

Lieberman, A., & Wood, D. R. (2002). *Inside the National Writing Project: Connecting network learning and classroom teaching.* New York: Teachers College Press.

Little, J. (1990). The persistence of privacy: Autonomy and initiative in teachers' professional relations. *Teachers College Record*, *91*(4), 509–536.

Marzano, R. J. (2003). *What works in schools.* Alexandria, VA: ASCD.

Matsumura, L. C., Garnier, H. E., Correnti, R., Junker, B., & Bickel, D. D. (2010). Investigating the effectiveness of a comprehensive literacy-coaching program in schools with high teacher mobility. *Elementary School Journal*, *111*(1), 35–62.

McKenna, M. C., & Walpole, S. (2008). *The literacy coaching challenge: Models and methods for grades K–8.* New York: Guilford Press.

MetLife Survey of the American Teacher: Collaborating for student success.(2010). Dallas, TX: MetLife.

Mongiello, P., Brady, D., Johnson, G., & Berg, J. (2009). Strength training: Institutes pump up teachers' roles as instructional leaders. *Journal of Staff Development*, *30*(4), 20–22.

National Staff Development Council. (2001). *Standards for staff development.* Oxford, OH: Author. Retrieved from *www.nsdc.org.*

Neuman, S. B., & Cunningham, L. (2009). The impact of a practice-based approach to professional development: Coaching makes a difference. *American Educational Research Journal*, *46*(2), 532–566.

Neuman, S. B., & Wright, T. (2010). Promoting language and literacy development for early childhood educators: A mixed-methods study of coursework and coaching. *Elementary School Journal*, *111*(1), 63–86.

Newmann, F. M. (Ed.). (1996). *Authentic achievement: Restructuring schools for intellectual quality.* San Francisco: Jossey-Bass.

Poekert, P. (2012). Teacher leadership and professional development: Examining links between two concepts central to school improvement. *Professional Development in Education*, *38*(2), 169–188.

Saunders, W. M., Goldenberg, C. N., & Gallimore, R. (2009). Increasing achievement by focusing grade-level teams on improving classroom learning: A prospective quasi-experimental study of Title I schools. *American Educational Research Journal*, *46*(4), 1006–1033.

Silva, E. (2008). *Measuring skills for the 21st century.* Washington, DC: Education Sector. Retrieved from *www.educationsector.org/usr_doc/MeasuringSkills.pdf.*

Smith, M., & Dickinson, D. (2002). *Early language and literacy classroom observation.* Baltimore: Brookes.

Sparks, D. (2004). Look for ways to ignite the energy within: An interview with Jane Dutton. *Journal of Staff Development*, *25*(3), 38–42.

Spillane, J. P. (2005). Distributed leadership. *Educational Forum*, *69*, 143–150.

Swan Dagen, A., & Nichols, J. (2012). Teachers as literacy leaders. In R. M. Bean & A. Swan Dagen (Eds.), *Best practices of literacy leaders: Keys to school improvement* (pp. 21–42). New York: Guilford Press.

Teacher Leadership Exploratory Consortium. (2011). Teacher Leader Model Standards

(TLMS). Retrieved from *www.teacherleaderstandards.org/downloads/TLS_Brochure.pdf.*

Vescio, V., Ross, D., & Adams, A. (2008). A review of research on the impact of professional learning communities on teaching practice and student learning. *Teaching and Teacher Education, 24*(1), 80–91.

Walpole, S. & McKenna, M. (2009). Everything you've always wanted to know about literacy coaching but were afraid to ask: A review of policy and research. In K. Leander, D. Rowe, D. Dickinson, M. Hundley, R. Jimenez, & V. J. Risko (Eds.), *58th yearbook of the National Reading Conference* (pp. 23–33). Oak Creek, WI: National Reading Conference.

Wei, R., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession*: *A status report on teacher development in the United States and abroad.* Dallas, TX: National Staff Development Council. Retrieved from *www.learningforward.org.*

Wei, R. C., Darling-Hammond, L., & Adamson, F. (2010*). Professional development in the United States: Trends and challenges.* Dallas, TX: National Staff Development Council. Retrieved from *www.learningforward.org.*

West, L., & Staub, F. C. (2003). *Content-focused coaching: Transforming mathematics lessons.* Portsmouth, ME: Heinemann.

Wood, D. (2007). Teachers' learning communities: Catalyst for change or a new infrastructure for the status quo? *Teachers College Record.* Retrieved from *www.tecrecord.org/PrintContent.asp?ContentID=12829.*

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (Issues & Answers Report No. REL 2007-NO. 033). Washington, DC: U.S. Department of Education. Retrieved from *ies.ed.gov/ncess/edlabs.*

York-Barr, J., & Duke, K. (2004). What do we know about teacher leadership? Findings from two decades of scholarship. *Review of Educational Research, 74*(3), 255–231.