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NEA RESEARCH
WORKING PAPER

Professional Community and Professional Development in the Learning-Centered School

Judith Warren Little
University of California, Berkeley

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Contents

For more than two decades, research has shown that teachers who experience frequent, rich learning opportunities have in turn been helped to teach in more ambitious and effective ways. Yet few teachers gain access to such intensive professional learning opportunities.[1] More typically, teachers experience professional development as episodic, superficial, and disconnected from their own teaching interests or recurring problems of practice. This prevailing pattern—a few rich opportunities, many disappointing ones—speaks both to the promise and to the limitations of professional development, as it is typically organized. An important part of this enduring story centers on the schools and districts where teachers work and whether they are positioned well to foster professional learning opportunities that enhance the quality of teaching and learning.

This paper focuses on professional development and professional community as foundations of the learning-centered school. Its purpose is to marshal research evidence that can be used productively to enhance professional learning and thereby to nourish such a school. To establish benchmarks for best practice, the paper begins with an overview of the goals that professional learning serves, suggests strategic content priorities, and ends with a discussion of effective approaches or means. It is addressed to school leaders—especially teachers and administrators—who must identify priorities for professional development and allocate scarce professional development resources in ways that will improve instruction and enhance children's success in school.

As will become apparent, the research is uneven (for a recent review, see Borko 2005). We know more about the characteristics of high-quality formal professional development (typically outside the school) than we do about the content, processes, and outcomes of ongoing, informal

[1] The evidence is consistent on this point. See findings from the nationally representative survey of elementary, middle, and high school teachers reported by Garet and others (2001) and the study of elementary teachers' participation in mathematics professional development conducted by Cohen and Hill (2001).

workplace learning. We know a substantial amount about how to help teachers become effective in helping students learn core academic subjects (especially math and science), but our knowledge tends to come up short when those students are also learning English as a second language. We know more about the benefits of strong student assessment practices than we do about how to help teachers incorporate such practices into daily instruction. We have begun to assemble rich portraits of teaching that responds to and builds on student diversity in ways that support student learning, but we have little in the way of research on related programs of professional development. The research provides more guidance for schools in some areas than in others—or, put another way, the lessons from research do not map neatly or completely onto the professional learning needs or interests of a given school. Nonetheless, it provides a worthy starting point.

The School's Stake in Teacher Learning

The basic premise of this paper is that a school is more likely to be effective in supporting high levels of student learning and well-being when it also plays a powerful, deliberate, and consequential role in teacher learning. As the context most directly connected to the daily enterprise of teaching and learning, the school has a stake in pursuing professional development purposes that together build the individual and collective expertise and commitment of the staff, sustain professional growth for both novice and veteran teachers, and equip the school to tackle its most central goals, priorities, and problems.

Four Goals for Teacher Learning

The school's stake in teacher learning may be expressed in terms of a set of four broad, ambitious goals that join the needs and interests of individual teachers to the collective needs and interests of the school.

Making Headway on the School's Central Goals, Priorities, or Problems

A key test of professional development lies in its capacity to mount a strong collective response to schoolwide problems or goals. Some of these problems and goals arise out of a broad policy agenda affecting all schools—raising the bar of educational achievement and closing the achievement gap. Other problems and goals arise from teachers' and parents' interest in educational benefits that go beyond measured academic achievement in tested subjects: students' overall intellectual growth; their social, moral, and political development; their independence and self-confidence; their aesthetic sensitivity; and more. Finally, some problems and goals arise out of the specific circumstances of each school. For example, schools in some areas have experienced a flood of non-English-speaking immigrants over the past two decades and reasonably expect that all or most teachers will acquire expertise in teaching second-language learners. A well-wrought school plan would show evidence that professional development forms one part of a larger strategy for pursuing ambitious levels of teaching and learning in this school, with these students, in this community, and with these resources.

Building the Knowledge, Skill, and Disposition to Teach to High Standards

The quality of a school's teaching staff can be judged by the depth and breadth of knowledge, skill, and judgment that teachers bring to their work, both individually and collectively. Sound hiring practices offer one resource in this respect, but hiring well-qualified teachers will not be sufficient to meet this goal. Insights into teachers' expertise and their learning trajectories have multiplied as researchers have uncovered the complexities of teaching and the cognitive and social demands associated with learning to teach well. Thus, one test of effective professional development is whether teachers and other educators come to know more over time about their subjects, students, and practice and to make informed use of what they know.

Cultivating Strong Professional Community Conducive to Learning and Improvement

Research has steadily converged on the importance of strong teacher learning communities for teacher growth and commitment, suggesting as well their potential contribution to favorable student outcomes. Schools whose staff members espouse a shared responsibility for student learning and are organized to sustain a focus on instructional improvement are more likely to yield higher levels of student learning. Creating and sustaining robust professional learning communities is difficult, but research provides examples of what such communities look like and helps illuminate the conditions that place them within reach. Effective professional development might thus be judged by its capacity for building (and building on) the structures and values, as well as the intellectual and leadership resources, of professional community.

Sustaining Teachers' Commitment to Teaching

Individuals experience professional development at particular points in a teaching career and in conditions that bolster

or erode commitment to teaching over time. Here, the test of professional development lies in teachers' access to professional opportunities that afford them satisfaction, support, and stimulation appropriate to their stage of career and that make good use of their acquired expertise and experience. Recent studies of teaching careers, derived primarily from in-depth biographical interviews, emphasize the meanings that individuals attach to their work, the kinds of professional responsibilities they seek, and the identities and relationships they form. These studies draw attention to overlooked intersections of professional career and professional development (e.g., how particular teaching assignments build on, stimulate, or frustrate teacher learning). Such studies seem particularly consistent with recent initiatives in the support and assessment of beginning teachers and the cultivation of networks, teacher research groups, and other manifestations of professional community.

Why Focus on the School?

Despite talk of "site-based staff development," most organized professional development activity takes place outside the school. Furthermore, in an era of heightened accountability pressures, more districts are exercising control over professional development, thus constraining funds and staff time at the school level. Yet an alternative vision of teacher learning is emerging from the research. School-based professional communities are the core of the system; these are purposefully and coherently linked with external professional development opportunities.

Why focus on the school?

First, and most simply, the school is where the work of teaching and learning resides. It is where the problems of practice take on a particular face, where pressures for achievement are most directly felt, and where investments in professional learning pay off or do not. To focus on the school is to sustain attention to improvements in teaching and learning and to signal a broad conception of professional development encompassing "the full range of activities, formal and informal, that engage teachers or administrators in new learning about their professional practice" (Knapp 2003, p. 112). The school looms large not because it is the site of formal professional development activity (although it may be) but because its staff have a stake in thinking wisely and strategically about whether and how the school is organized to invest in professional learning.

Second, the school is important because a school's failure to create an environment conducive to professional learning has high costs. Students bear those costs in the form of inadequate instruction and high teacher turnover. Teachers bear the costs in the form of weak instructional support and personal stress. In contrast, schools that are well organized for professional learning stand to reap the benefits of demonstrable student gains and enduring teacher commitment. Over the past two decades, evidence has accumulated that the workplace learning environment matters. Schools that support teacher learning and foster a culture of collegiality and continuous improvement are better able to support and retain new teachers, pursue innovation, respond effectively to external changes, and secure teacher commitment (Johnson and others 2004; Little 1982, 2003; Little and Bartlett 2002; Louis and Kruse 1995; McLaughlin and Talbert 1994, 2001; Rosenholtz 1989).

Corresponding to the four goals for teacher learning outlined above, conceptions of professional development in education have both broadened and deepened over the past two decades. We have moved from a model that emphasized the acquisition of discrete skills and behaviors to a more complex vision of teacher thinking, learning, and practice in particular subject domains. We have moved increasingly away from an individualistic view of teacher growth and toward a view that emphasizes a school's collective capacity and that credits the potential power of strong professional community. We have acknowledged the ways in which teachers' career experience and teaching commitments are shaped by the quality of the workplace environment and by the nature and extent of their professional ties. In addition, in many schools and districts, professional development planning has matured. Plans that were once a laundry list of activities are more often framed in terms of explicit links between student learning goals and expenditure of professional development resources.

It is true that school-level changes emerging from these bodies of research have been slow in developing. The most ambitious examples of powerful teacher learning remain relatively rare and modest in scale. Not all practitioners can say that they have frequent and meaningful contacts with colleagues or consultants or that they have been richly supplied with stimulating ideas, materials, and experiences. Indeed, many would readily report being "in-serviced" in ways that do little justice to their experience, interests, and circumstances. Patterns of local resource allocation at both the school and district levels have tended to favor traditional training models over promising but unfamiliar alternatives. Large districts are more likely than smaller ones to offer intensive, sustained professional development. Few schools or districts conduct meaningful

evaluation of the benefits derived from professional development activity. Yet meaningful shifts are evident. Table 1 summarizes the direction of these shifts in the form of strategic benchmarks for professional development and professional community at the school level.

Of course, no school exists in a vacuum. Schools are embedded in relationships that directly or indirectly affect teachers' work and professional development—relationships with school districts, the state, professional associations, reform organizations, and various professional development providers or partners. In particular, school districts have assumed growing importance as a context for professional learning and as a source of both resources and requirements for teaching. Although this paper centers on the school, it does so with the understanding that the school's ability to support teachers' professional learning depends both on its *internal resources* and on its *external connections* and relationships.

Professional Development Rooted in Goals And Problems of Teaching and Learning

Educators and researchers have lambasted the scattered, shallow, fragmented array of activity that so often makes up the professional development landscape, reserving special criticism for activities that seem remote from teachers' priorities and problems of practice. In a paper commissioned for the National Commission on Teaching and America's Future, Ball and Cohen (1999) acknowledged this long-standing problem and offered a remedy: designing professional development more persuasively "in and from practice" (p. 10):

> Rarely do…in-services seem based on a curricular view of teachers' learning. Teachers are thought to need updating rather than opportunities for serious and sustained learning of curriculum, students, and teaching.…
>
> Hence, we propose new ways *to understand and use practice as a site for professional learning,* as well as ways to cultivate the sorts of inquiry into practice from which many teachers could learn. (Ball and Cohen 1999, pp. 3–4, 6, emphasis added.)

Problems of Practice and the Instructional Triangle

When Ball and Cohen (1999) urged more opportunities for teachers to learn in and from professional practice, they focused professional development squarely on what many now term the *instructional triangle:* the relationships between teacher, students, and content. The instructional triangle encompasses the dynamic, fluid, and complex interactions by which teachers help children learn challenging subject content and pursue other important intellectual and social goals.

Lampert's *Teaching Problems and the Problems of Teaching* (2001) provides a compelling illumination of the instructional triangle. Drawing from her 5th grade classroom, Lampert showed how teaching mathematics required that she solve problems related not only to her goals for students' content learning but also—and simultaneously—to her goals for building a classroom culture in which children can reason and argue about mathematics, learn how to work both independently and collaboratively, build up "intellectual courage," and develop a sense of their own growing understanding and accomplishment. In working toward those ambitious ends, she had to find ways to "cover the curriculum" without compromising "the complex character of content" while contending with "the complexities of human character." Throughout the book, the children's encounters with problems in mathematics helped Lampert, as teacher, expose and work on the problems of teaching.

Lampert's (2001) book embodies the kind of teaching knowledge required if teachers are to help all children meet ambitious standards. It also suggests the crucial importance of professional learning opportunities that are rooted firmly and specifically in problems of practice. Finally, it demonstrates the way in which the large, seemingly intractable problems of student achievement and achievement gaps—the problems that pervade policy debates and that stimulate waves of reform—take on a local and arguably more tractable face in each classroom and each school.

Consistent with the principle of organizing professional development in and from practice, then, a school organized for teacher learning would promote systematic attention to teaching and learning in multiple ways. School leaders would support teachers in acquiring a deep understanding of what it means for children to learn core concepts and skills in particular subject domains. School staff would develop the habit of collectively examining evidence of student learning and investigating the sources of students' progress or difficulties. Teachers would be helped to locate and participate in the best of external professional development opportunities and to parlay what they learn into collective capacity in the school. Partnerships with organizations or groups outside the school would be

Table 1. Benchmarks for Professional Community and Professional Development

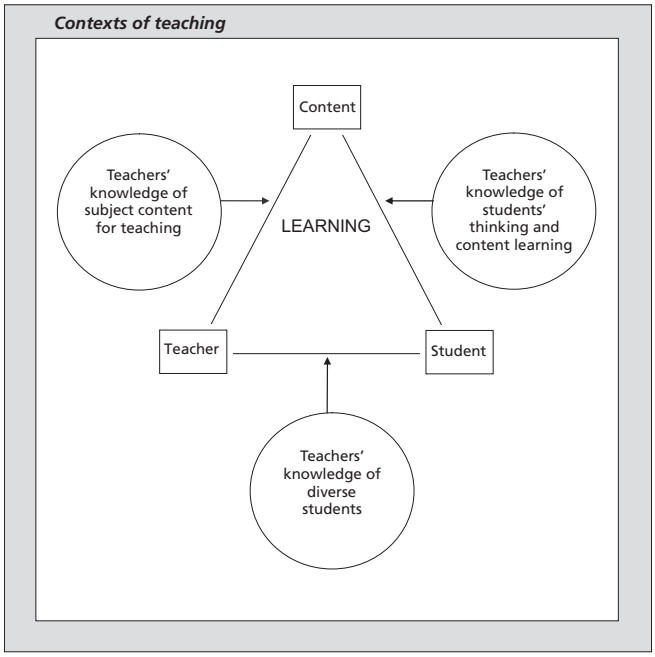
Benchmarks for…	Moving from…	Moving toward…
Purposes for professional development	Individual knowledge or change	Individual, collective, and school goals: ■ Making headway on school goals and problems ■ Building knowledge and skill to teach to high standards ■ Cultivating a strong professional community ■ Sustaining professional commitment.
Content focus of professional development	Unfocused "laundry list" of topics not related to school improvement goals Relationship to student learning unclear, unexamined, or left up to teachers to figure out	Focus on the "instructional triangle": ■ Pedagogical content knowledge ■ Student thinking, learning, and assessment ■ Understanding and responding to student diversity.
Strategy for professional development	Episodic training events on topics often disconnected from practice Strategies poorly designed to achieve effect	School-based professional communities are the core; these are coherently linked with external professional development opportunities. Strategies have characteristics associated with effectiveness: collective participation, active learning, coherence, sustained duration.
Professional community as resource for professional learning	Professional community a weak resource for professional learning Little attention by school leaders to building strong professional community Working conditions weakly or unevenly conducive to professional learning	Continuous learning is a school-wide norm; learning is embedded in the professional community. Cultivating professional community is a focus for school leaders. Working conditions are conducive to professional learning (teaching assignment, time, space, materials, and access to colleagues).
External professional development supports	Insufficient external support for teacher learning and school capacity building	Multiple external professional development opportunities link school professional communities with ■ New advances in knowledge about subject content, learning, and teaching ■ Opportunities to understand students and their diverse communities ■ Externally developed tools and materials.

strategically chosen for their contributions to professional development and professional community.

From Problems of Practice to Professional Development

Working from the image of the instructional triangle, the following sections take up three entry points for professional learning. As Figure 1 shows, each represents one of three principal *relationships* in the instructional triangle; each offers a potential focus for activity within the school and for strategic participation in programs and partnerships beyond the school. The instructional triangle is useful as a strategic guide that provides a clear focus for the *content* of professional development.

Figure 1. Professional Development and the Instructional Triangle



Source: Adapted by the author from Cohen, Raudenbush, and Ball (2003).

The first relationship centers on teachers' understanding of subject domains for purposes of teaching. A substantial body of research now supplies evidence that teachers benefit from in-depth understanding of subject-specific concepts and from an understanding of how to help students learn them. Research on subject-specific professional development programs, sometimes in conjunction with innovative curricula, shows the power of intensive professional development to deepen teachers' understanding, alter teaching practice, and promote student learning. In particular, these programs may help teachers transform basic subject knowledge into the practical knowledge required for teaching, or what Shulman (1986) termed *pedagogical content knowledge.*

The second area of professional development activity and research centers on teachers' grasp of students' thinking and learning. This relationship puts students' interaction with the content of the curriculum into the foreground. It encompasses efforts to expand teachers' facility with formative assessment as well as other initiatives that involve close, collective examination of students' thinking by means of what students say and do and the work they produce. In all of these activities, an underlying assumption is that systematic attention to student learning—and to students' responses to the instructional activities intended to promote that learning—will foster teacher learning and improve instructional decision making.

The final relationship focuses on teachers' understanding of and responsiveness to the students they teach, with special emphasis on understanding the nature and significance of student diversity. Of the three starting points for professional development, this relationship presents the broadest terrain by encompassing the many sources of student diversity—cultural, linguistic, cognitive, and more—that present resources and challenges for teaching and learning. Further, it offers a particular reminder that the instructional triangle of classroom life resides in—and reflects—multiple contexts beyond the classroom.

As Figure 1 suggests, these three relationships intersect and intertwine in practice. However, each relationship places a different aspect of the instructional triangle at the center, and each tends to emphasize a different central purpose for professional development activity. Subject-specific professional development focuses principally on the depth of teachers' subject-teaching expertise and how it might serve as a scaffold for children's learning, aided by well-designed curricula and instructional resources. Professional development focused on children's thinking and student work turns attention to the nature and progression of children's learning (in general and in particular subject areas) and the meaning they make of instructional activities and materials. Finally, professional development focused on student characteristics and conditions highlights teachers' knowledge of how those characteristics and conditions affect students' success in learning and how teachers' response matters. Together, the three suggest a broad set of foundational concerns and priorities for professional development.

Building Subject Knowledge for Teaching and Learning

In the last decade and a half, perhaps the most important developments in teaching and professional development center on expertise in specific domains of subject teaching. As teachers attest and research amply demonstrates, simply knowing a subject is not sufficient for knowing how to teach it. Nor is familiarity with a generic set of pedagogical routines sufficient for teachers to manage the subject-specific complexities that arise as students grapple with new concepts or skills.

The term *pedagogical content knowledge,* coined in the mid-1980s by Shulman (1986, 1987), captures a notion that dates to John Dewey in the early 20th century: that teachers must find a way to connect the subjects they teach to students' ideas and experience in ways that yield deep conceptual understanding and build skill and competence. Broadly defined, pedagogical content knowledge is the practical knowledge that enables teachers to transform the content and epistemology of a subject discipline for purposes of teaching.

Convincing evidence regarding the importance of pedagogical content knowledge comes from studies that range from small-scale, quasi-experimental investigations of teacher change to large-scale survey studies of content-focused professional development. Together, these experimental and survey-based studies support certain conclusions about the importance of subject-focused professional development and about the most effective features of professional development design.

In one experimental project designed to help elementary teachers with the teaching of fractions, researchers designed activities focused on the underlying mathematics, the specific math curriculum, children's mathematical understanding and motivation, and student assessment, including the use of student work and classroom videos to illuminate children's mathematical thinking and development (see Saxe, Gearhart, and Nasir 2001). Project researchers developed three professional development configurations. Teachers in the first group participated in an intensive program that included the full set of content-focused activities, facilitated by the project developers; a second group received the curriculum materials and participated in an implementation support group, but did not experience the structured activities; and a comparison group taught as usual. The most significant effects on student learning and the most uniform shifts in teaching practice were associated with the group having the most intensive and integrated approach to looking at mathematics, children's understanding, and assessment. Other studies of specific programs, primarily in mathematics and science but also in literacy and history, offer similar findings.[2]

Large-scale survey studies reinforce the findings from these small-scale, program-specific experimental studies. In a detailed survey of professional development participation and classroom practice in mathematics reported by California elementary school teachers, Cohen and Hill (2001) found that the more that professional development focused in depth on mathematics curriculum, instruction, and assessment (e.g., by working with teachers to understand and prepare for the use of replacement units), the more teachers' classroom practice reflected an ambitious conception of mathematics teaching. Schools where teachers reported the most ambitious practices of mathematics instruction were also those with higher student achievement in mathematics.

Findings from an evaluation of the large, federally funded Eisenhower Professional Development Program in math and science further help to specify the characteristics of "high-quality professional development" in content areas. In a three-year study of teachers in 30 schools in five states, researchers investigated the extent to which professional development accounted for reported changes in classroom practice. In a paper summarizing the study, Desimone and others (2002) reported that teachers with the highest level of participation in particular kinds of subject-focused professional development also showed the greatest changes in their reported math and science practice. Taken together, these studies underscore the likely benefits of content-focused professional development compared with other emphases. They also point to the conditions under which those benefits are likely to be realized.

Sustained Focus on Subject Teaching

Professional development with a sustained focus on subject teaching—strongly tied to the curriculum, instruction, and assessment that students would encounter—produces the most consistent effect on subject teaching and student learning.[3] Other professional development

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[2] An exhaustive review of this literature is beyond the scope of this paper. Among the research reviews, see Wilson and Berne (1999); Kennedy (1998); Little (2004); Randi and Zeichner (2004).

[3] In research conducted in the 1960s and 1970s, professional development focused on generic pedagogical practices was shown to have measurable effects on students' basic skills (Brophy and Good 1986). More recent research suggests that the depth of student learning is related to the depth and subject-specificity of teacher learning. For a useful brief summary, see Cohen and Hill (2005).

emphases, such as using hands-on activities, organizing cooperative small groups, taking steps to increase gender equity, or preparing teachers for leadership roles, certainly respond to widespread interests and concerns. However, none of them shows a consistent relationship to teachers' conceptions of subject teaching or reported practices of subject teaching. Only the professional development focused on subject knowledge for teaching does so.

Collective Participation, Active Learning, and Coherence

A focus on subject-teaching content thus appears to be necessary, but it is also insufficient. In the Eisenhower evaluation studies cited above (Desimone and others 2002), individual participation had less of an influence than participation by a group of teachers from the same school, department, or grade level. Programs were also more effective when they afforded teachers the opportunity "to become actively engaged" and were coherently linked to prior knowledge and other activities. The authors sum up:

> Professional development is more effective in changing teachers' classroom practice when it has *collective participation* of teachers from the same school, department, or grade; and *active learning opportunities,* such as reviewing student work or obtaining feedback on teaching; and *coherence,* for example, linking to other activities or building on teachers' previous knowledge. (p. 102, emphasis added.)

Time Matters, but Only If Focused on the Right Stuff

Common sense suggests that activities of greater duration would yield more benefits. However, just as *subject* focus alone is insufficient to enhance teacher knowledge and practice, so must greater investments of *time* be coupled with other strategic and design choices. In the study of California's elementary teachers described above (Cohen and Hill 2001), teachers with the most sustained professional development were more likely to pursue extended mathematical investigations with their students, hold classroom discussions about problems and their solutions, and have students write or talk about their mathematical reasoning. The study's authors emphasized that "time spent had a potent influence on practice," but only if the time was spent on content, curriculum, and student tasks (p. 88).

Similarly, the national survey of teachers conducted for an evaluation of the Eisenhower professional development programs (Garet and others 2001) found that the "duration" of professional development (defined both in terms of total contact hours and span of time over weeks or months) achieved its effect primarily through the greater likelihood that teachers would experience active forms of professional learning and a coherent link between new professional learning, prior professional learning, and student learning standards in their state, district, and school.[4]

The principal lesson from this body of research is that teaching to high academic standards requires subject knowledge *for teaching.* This pedagogical content knowledge is most effectively developed through professional development that combines a number of key features. Effective professional development is content-focused, active, collective, coherent, and sustained.

Focusing on Students' Thinking and Evidence of Learning

Students produce a mountain of work in school each year, but only a fraction of those data are mined for instructional guidance. (Supovitz and Klein 2003, p. 13.)

Most teachers say they learn from their experience with students and that they do so in the course of their daily work. Yet few say they have the time or resources to stand back from the daily fray and articulate what they have learned—or how they have learned it. Few teach in circumstances where their observations of students and their explanations of student success or failure form part of an ongoing dialogue with colleagues or inform a school-level assessment of teaching effectiveness. Even where such dialogue occurs, it may be narrowed and constrained by an emphasis on measured achievement that limits consideration of the nuances of students' thinking.

Meanwhile, a growing body of research suggests that systematic attention to children's thinking and learning will pay off in improved classroom practice and student outcomes. As one recent review (Grossman, Schoenfeld, and Lee 2005) put it:

> Effective teachers know much more than their subjects, and more than "good pedagogy." They know how students tend to understand

[4] By helping to specify the conditions under which "more time" matters, these two studies (i.e., Cohen and Hill 2001; Garet and others 2001) help explain why Kennedy's (1999) review of professional development effects on student learning found minimal or inconsistent results with regard to the duration and distribution of professional development.

> (and misunderstand) their subjects; they know how to anticipate and diagnose such *mis*understandings and they know how to deal with them when they arise. (p. 205.)

This body of research includes studies of three main sorts. A first category of research involves collaborative classroom assessment studies, in which teachers and researchers have worked together to develop and validate assessments embedded in curriculum in core academic areas. These studies supply evidence of benefits to students and to teachers when assessment strategies are integrated into instruction. Based on a review of collaborative assessment research and other quasi-experimental studies of professional development, Little (2004) concluded that

> These studies…provide evidence that groups whose members systematically examine student work and student thinking were associated with higher student learning gains, more self-reported and observed change in teaching practice, and more growth in teacher knowledge than comparison groups where looking at student work was not a central activity. (pp. 104–05.)[5]

A second group of studies focuses on professional development programs and other school-based activity in which teachers' collective examination of student work and investigation of students' thinking forms a principal resource for professional learning. These studies show how teachers' fund of pedagogical content knowledge deepens as they pay closer attention to evidence of students' thinking as revealed both in classroom talk and in the work students produce. However, these same studies tend to show that it takes time, support, and structured opportunity for teachers to develop productive approaches to collecting evidence of student thinking and learning, distilling what might be learned from it.[6]

A final category of studies has developed in the context of whole-school reform efforts in which improved student assessment plays a pivotal role. These studies provide examples of whole-school, grade-level, and classroom assessments, together with accounts of how changes in assessment helped to advance an agenda of schoolwide reform and boost student achievement.[7] Experiments in school restructuring during the 1990s frequently entailed an emphasis on "authentic assessment" of student learning, providing structured processes and instruments for describing, analyzing, and reporting on student progress. Examples range from the collective use of the Primary Language Record to chart and support children's language development in elementary schools to the public presentation and review of student portfolios or senior projects at the high school level (Darling-Hammond, Ancess, and Falk 1995).

These studies underscore the value that teachers attach to professional conversations anchored in student thinking and performance. Altogether, this body of research points schools toward more frequent and focused discussion of student learning data from a variety of sources that range from standardized test results to teachers' accounts and artifacts of what children do, say, and produce in the course of everyday instruction. Two directions seem especially promising for schools. One is to expand the quality and variety of formative assessments at the classroom level; a second is to promote and organize collective inquiry into and discussion of student progress and achievement based on a range of evidence, including but not restricted to standardized achievement measures.

Expanding Formative Assessment of Student Learning

Assessment for learning is any assessment for which the first priority in its design and practice is to serve the purpose of promoting students' learning. (Black and others 2004, p. 10.)

Formative assessment occurs in and through instruction, with the fundamental purpose of providing teachers and students with information on the progress of learning. Having reviewed more than 250 studies of formative assessment, British researchers Black and Wiliam (1998) concluded that

> innovations that include strengthening the practice of formative assessment produce significant and often substantial learning gains. These studies range over age groups from 5-year-olds to university undergraduates,

[5] For reports of specific studies, see Wilson and Sloane (2000); Wolf and Gearhart (1997); Herman and others (2005).

[6] For examples of studies situated in formal programs of subject-specific professional development, see Kazemi and Franke (2004); Richardson (1994); Franke and others (2001). For an example of efforts to organize school-based conversations involving "looking at student work," see Little and others (2003).

[7] For a collection of examples, see Darling-Hammond, Ancess, and Falk (1995).

> across several school subjects, and over several countries. (p. 140.)

Based on what they characterized as a "wealth of evidence," these authors (Black and Wiliam 2004) concluded that the accumulated research strongly warrants an investment in professional development aimed at expanding the use of formative assessment in classrooms and schools:

> Such improvements [in formative assessment], produced across a school, would raise a school in the lower quartile of the national performance tables to well above average. Thus, it is clear that, far from having to choose between teaching well and getting good test scores, teachers can actually improve their students' results by working with the ideas we present here. (p. 11.)

Scholars in the United States also advocate a substantial increase in the use of formative assessment as a means to strengthen instruction and boost student learning. In a recent paper intended to inform programs of teacher education, Shepard and others (2005) concluded that effectively implemented formative assessment can improve student achievement as much or more than other powerful interventions such as intensive reading instruction or one-on-one tutoring.

To yield such powerful benefits for teaching and learning, formative assessment must be closely integrated in instruction and must rest on a strong foundation of pedagogical content knowledge in the subjects being assessed. Yet despite the potential power of formative assessment to strengthen instruction and aid student learning, few teachers have been prepared to make effective use of it—or to create the kind of classroom instructional environment that is compatible with it. Shepard and others (2005) warned that the majority of teachers have limited knowledge of formative assessment strategies, tending to think of assessment primarily for purposes of grading (see also Herman and others 2005).

Similarly, Black and Wiliam (1998, p. 141) observed that the gains in student learning associated with increased use of formative assessment require practices that remain relatively scarce in "normal" classrooms. The authors remarked on the current "poverty of practice" and argued that developing the necessary practices and perspectives would entail "sustained programs of professional development and support" (p. 146).

Altogether, then, the available research provides persuasive evidence that schools would benefit by expanding the use of formative assessment but that most face professional development challenges in doing so. Projects under way in England and the United States provide some guidance regarding effective professional development for formative assessment. For example, Black and Wiliam (2004) worked with teachers to develop specific classroom practices that generate evidence of student learning, which in turn informs instructional modifications. Teachers participated in nine one-day professional development events over a period of 18 months, interspersed with opportunities to try out new approaches and to discuss their experiences and ideas with project researchers. Researchers report that evidence collected from the teachers in the form of interviews, observations, and reflective writing indicates that the teachers achieved "very significant, often radical changes in their instructional practices" (Black and Wiliam 2004, p. 46) and that they attributed those changes to the professional development in which they had participated. Those instructional practices included the effective use of questioning strategies to elicit student thinking and reasoning; student feedback that minimized the use of grades or marks and emphasized the use of comments targeted to learning goals and next steps in learning; and the development of peer- and self-assessment routines and norms.

Fostering Schoolwide Conversation about Student Learning and Achievement

At the school level, teachers increasingly are being asked to consider evidence of student learning as a basis for establishing instructional priorities. One mark of schools that make headway on the achievement gap appears to be their propensity to promote and organize conversations based in evidence of student progress. Symonds (2003) compared schools that had made progress in closing the achievement gap, as measured by California's Academic Performance Index (API), with schools that had not. Drawing on academic performance data and surveys from teachers in 32 K–8 schools, Symonds determined that most schools devoted attention to student assessment and most linked professional development to high-priority areas, but that the gap-closing schools were home to a far more intensive, ongoing set of activities and conversations focused on student learning and instructional improvement.

Schools in Symonds' (2003) study differed dramatically in the frequency with which they assessed student progress and with which they based staff discussions on student performance evidence. Nearly two-thirds of respondents

from gap-closing schools reported such activity a few times a month or even weekly, whereas most teachers from other schools reported such activity infrequently or never. Teachers in the gap-closing schools were much more likely to work with school leaders who actively encouraged inquiry into the nature of the achievement gap and to receive professional development that helped them craft instructional responses to the problems targeted by the evidence in hand. Finally, the evidence-based conversations in gap-closing schools were not limited to the evidence yielded by external tests. Rather, they built a habit of assessment designed to gauge growth in student learning and to help teachers refine instruction. In effect, these schools developed a collective capacity for *formative assessment* of student progress as a resource for their own decision making, although they credit the need periodically to take stock of whether and how well students have mastered particular concepts and skills (*summative assessment*).

In a study of America's Choice schools completed by the Consortium for Policy Research in Education (CPRE; Supovitz and Klein 2003), researchers found teachers and administrators making extensive use of multiple sources of student learning data. Data sources ranged from the results of standardized tests to student portfolios, various kinds of open-ended assessments, and the use of "running records" in reading. Of these, school leadership teams reported the classroom- and school-based assessments as most useful and the state and district assessments as less helpful—mainly, it appears, because states and districts do not provide timely feedback. The researchers attributed the effective use of assessment and assessment-based conversations in large part to school leaders, remarking that a culture of inquiry had "taken root into the culture of the school," and that "the fingerprints of strong leadership are all over the data activities in the schools in this study" (pp. 2, 18).

Preparing for Student Diversity

Teachers' understanding of their students and the relationships they form with those students remain central to the success of the teaching enterprise. Classrooms are inevitably diverse places, and each class presents its own new possibilities, resources, and challenges. As we are reminded in a recent essay, "*Teaching Diverse Learners* (Banks and others 2005), "diversity is the nature of the human species, and students are and always have been different from each other in a variety of ways" (p. 232). However, that essay goes on, through a series of compelling vignettes, to illustrate the difficulties that teachers face in deciding how best to respond to the kinds of diversity their students present.[8] Those vignettes—about the school's response to a child's developmental and learning difficulties; about feedback to a student who has produced troubling work; and about the special needs of English language learners—illuminate the magnitude of the task that teachers face in preparing to teach students whose backgrounds and perspectives may be very different from their own.

Added to the human complexities present in all teaching relationships, then, teachers in American schools increasingly confront the challenge of understanding and bridging differences that historically have disadvantaged entire groups of children. Of course, enduring inequities have roots in political, social, and economic conditions outside the school. Nonetheless, research also shows clearly how the school and classroom are implicated in either sustaining those inequities or interrupting them. Because schools and teachers matter, for good or for ill, and because tackling the disparity in outcomes proves so difficult, schools have a stake in knowing what contribution investments in professional development might make.

Building on Successful Equity-Oriented Classroom Practice

Portraits of successful classroom practice have multiplied. Studies of teachers who are effective in teaching students of color, children from poor families, children learning English as a second language, or children with learning disabilities supply concrete images of effective practice and help to shape an agenda for professional development. These emerging portraits consistently underscore the importance of the entire "instructional triangle" and its relations among teachers, learners, and content.

In a synthesis of the research on the knowledge, skills, and experiences needed for teaching diverse learners, Cochran-Smith (1997) also emphasized the importance of foundational subject-matter knowledge linked to teachers' shared commitments to students. She reported that researchers who have studied culturally responsive teachers, such as Ladson-Billings (*The Dreamkeepers,* 1994), and educators who have successfully led or taught in high-achieving urban schools, such as Meier (*The Power of Their Ideas,* 1995), find that one crucial element of teachers' success rests in their "passion" for engaging students with important subject matter.

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[8] Teaching "diverse learners" may take the form of teaching in heterogeneous classrooms or schools or teaching in settings in which the student enrollment is fairly homogeneous but the background of the students is different from that of their teachers.

The same observation emerges from a two-year study of 140 classrooms in 15 schools across three states (see Knapp and Associates 1995). In that study, "teachers who were most successful teaching for meaning [in high-poverty schools] were those with a deep knowledge of subject matter as well as a conception of students as active participants in learning whose prior knowledge must be connected to school subject matter" (Cochran-Smith 1997, p. 39). In the classrooms of the most successful teachers, students learned basic skills as tools to aid them in more ambitious tasks, such as writing extended texts, rather than as discrete, decontextualized skills. Knapp and Associates (1995) wrote:

> The more classrooms focused on teaching for meaning—that is, geared reading instruction to comprehension, and writing instruction to composing extended text—the more likely students were to demonstrate proficiency in…reading comprehension and written communication, all other factors being equal.
>
> …Approaches to…reading and writing instruction that emphasized meaning were likely to work as well for lower achieving children as for higher achieving ones, and sometimes better. (p. 142.)

These studies have special import when they demonstrate how shifts in classroom practice enhance students' success in "gatekeeper" domains such as early literacy and secondary mathematics that tend to make or break students' chances for future opportunity. In one such example, researchers traced the mathematics learning of 700 high school students in three schools as they progressed through four years of high school (Boaler and Staples 2005; see also Horn 2005). The researchers examined the nature of teaching that students experienced, the students' attitude toward mathematics, and the students' mathematics learning. Among the three schools, the one with the highest level of student diversity—an urban school with a culturally, linguistically, and socioeconomically diverse student population—produced the greatest surprises:

> At the beginning of high school, "Railside" students were achieving at significantly lower levels than the students at the other two more suburban schools in our study.[9] Within two years, the Railside students were significantly outperforming students at the other schools. The students were also more positive about mathematics, they took more mathematics courses and many more of them planned to pursue mathematics at college. In addition, achievement differences between students of different ethnic groups were reduced in all cases and were eliminated in most. By their senior year, 41 percent of Railside students were taking calculus compared with about 27 percent of students in the other two schools.
>
> At Railside, mathematics classes were calm and peaceful, with a high work-rate and few behavioral problems, and the ethnic cliques that are evident in many schools did not form. In interviews, the students told us that they learned to respect students from other cultures and circumstances through the approach used in their mathematics classes. The mathematics teachers at Railside achieved something important that many other teachers could learn from—they provided students from disadvantaged backgrounds a great chance of success in life and they taught them to enjoy mathematics and to include it as part of their futures. (Boaler and Staples 2005, p. 1; see also Boaler 2004).

Boaler and Staples (2005) attributed Railside's favorable student outcomes to a complex combination of practices and conditions, both in the classroom and among the teachers as a department. The research findings are consistent with other studies in pointing to the importance of the teachers' stance toward their subjects and their capacity to work with subject learners in deep and flexible ways.[10] The teachers focused especially on algebra, creating a common curriculum in which core concepts were taught through problems with multiple solution paths. Students were also helped to use mathematical language, graphs, tables, and other representations as tools to develop and express their reasoning.

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[9] The example of "Railside" school actually draws from two complementary studies of the same school and teachers. In Boaler and Staples (2005), the school is named Railside; in work published by Horn (2005) and Little (2003), it is called East High. "Railside" is used throughout as a matter of convenience.

[10] For additional case study examples, see Lee's (1995) research on African-American students in an experimental high school English course and Tharpe and Gallimore's (1988) study of literacy practices that bridge home and school in a program for native Hawaiian children.

In addition, the research findings at Railside are consistent with studies that point to the importance of collective participation in professional development and to shared responsibility for student learning and mutual support among colleagues. Drawing from the ideas of Complex Instruction developed at Stanford University (Cohen and Lotan 1997), the Railside teachers set about systematically and explicitly replacing the usual status order in the mathematics classroom—one in which the students who perform mathematical tasks quickly are the "smart" kids—with one in which many kinds of contribution are needed and valued. The teachers credit their ability to transform the student culture of the math classroom in large part to their professional development experience in adapting the equity principles of Complex Instruction in combination with their membership in a strong network of reform-oriented math educators and participation in reform-oriented mathematics professional development outside the school. Meeting on a weekly basis, the teachers continually assessed students' success and struggles, refined the curriculum, and helped each other with problems of teaching practice (Horn 2005). The Railside math department is similar to departments described by Gutierrez (1996) as "organized for advancement," that is, organized to enhance students' access to and success in rigorous academics.

From Exemplary Classrooms to Professional Development

Therefore, a question arises: What kind of professional learning opportunities equip teachers for "thinking pedagogically about diversity" in ways that are both "academically challenging and responsive to students" (Banks and others 2005, p. 245)? In answering that question, we are hampered by certain difficulties. The first is the apparent scarcity of professional development focused on preparing teachers for student diversity—or at least the relatively low rates of participation in the opportunities that do exist. In a report by the National Education Association (NEA 2003), only 40 percent of teachers surveyed reported having participated in professional development for "managing diversity in the classroom," compared with 82 percent who reported participating in subject-matter professional development, with substantially more participation by minority teachers (55%) than white teachers (38%).

A second difficulty is the apparent tendency to separate professional development for "diversity" or "equity" from professional development designed to deepen subject-teaching knowledge. Much of the professional development (and corresponding research) targeted toward student diversity has the effect of turning the instructional triangle into a set of parallel lines. The result is that teachers may acquire greater awareness of and sensitivity to student differences without understanding how to draw on that awareness to engage students in particular subjects, or vice versa. As Cochran-Smith (1997) observed in a review of the research, "the teacher's knowledge of subject matter is given little attention in the literature on teaching diverse populations. Likewise, the teaching of culturally diverse learners is given little attention in the growing literature on teaching subject matter" (p. 38).

An additional difficulty is that in comparison with research on subject-related professional development, there exists relatively little research on professional development designed to prepare teachers for student diversity. Even programs with extensive research on classroom implementation and student outcomes (e.g., Cognitively Guided Instruction or Success for All) tend to offer little or no research on teachers' professional development experience or teacher learning outcomes. Knight and Wiseman (2006) reported in a recent review of the literature that studies about the effects of professional development for teachers of diverse students provided too little detail about the professional development activity itself to provide practical guidance for improving it.

The growing body of research on teaching diverse learners provides some clues for professional development in part by helping to specify the nature of the challenges teachers face and by identifying the kinds of knowledge, skill, and dispositions evident in successful classrooms and schools (e.g., Stodolsky and Grossman 2000). That research supports the importance of professional learning that keeps all the relations of the instructional triangle in view, making explicit links between subject-matter preparation and the knowledge, perspectives, and needs of diverse learners. As McDiarmid (1991) noted more than a decade ago, "Teachers' capacity to evaluate the appropriateness of representations they make of their subject matter depends, then, on their view of learners as well as on their understanding of the learners' relationship to the subject matter" (p. 263).

On the one hand, it seems unlikely that teachers working only to strengthen their subject-teaching expertise will be able automatically to detect, appreciate, and build on the diverse cognitive, cultural, and linguistic resources that students bring to the classroom. In a recent essay, Banks and others (2005) organized their discussion of what teachers need to know by illustrating what teachers must know and do to create the "culturally responsive classroom" and the

"inclusive classroom." By "culturally responsive," the authors meant classrooms organized to support the learning of children from diverse racial, ethnic, linguistic, and socioeconomic backgrounds. "Inclusive" referred specifically to classrooms supportive of children with other "special needs" such as learning or physical disabilities. Both notions emphasize building on children's knowledge and strengths, accepting and capitalizing on differences, and creating a classroom environment that is physically and emotionally safe for learning.[11]

On the other hand, it is unrealistic to expect teachers to figure out independently how to transform subject-matter teaching on the basis of a newly found sensitivity to student diversity. Professional development is likely to be limited in its classroom effects if focused primarily on teachers' awareness, attitudes, and generic pedagogical strategies.[12]

As a case in point, Sleeter (1997) completed a study of the classroom impacts of a two-year program of multicultural education, observing the professional development sessions and teachers' classroom practice and interviewing teachers about what they had learned. Most teachers reported having developed a new level of awareness regarding student diversity, becoming more sensitized to differences among students and more knowledgeable about multicultural education ideas. Some teachers made modest—generally short-lived—changes in their use of cooperative learning and in their attempts to interact with all students. Overall, however, the proposed teaching strategies appeared only sporadically and rarely in the context of a core content area: "Few teachers substantially reconstructed their teaching in any discipline over the 2-year period" (p. 689). Furthermore, an analysis focused specifically on mathematics teaching found virtually no effects of the professional development on teachers' conceptions of mathematics curriculum or their instruction. Indeed, "most did not see much connection between multicultural education and mathematics" (p. 686). These findings indicate that teachers are unlikely to recognize connections between multicultural awareness and subject teaching where they are not helped to develop them explicitly and concretely in ways that deepen their command of subject-teaching possibilities.

To create more responsive and inclusive classrooms, it appears, requires that professional development help teachers explicitly develop inclusive and culturally responsive practices relevant to students' success with the core subjects they teach. Studies of teachers like those at Railside suggest that professional development will be most potent if it joins an equity mission, teachers' understanding of student diversity, strategies designed to open up students' learning opportunities, and serious work on subject-matter teaching.

Everything we know about the nature of ambitious and successful classroom teaching points toward taking the instructional triangle seriously as the point of departure for professional learning. In doing so, however, schools take on a task of considerable magnitude. The sheer magnitude of the task, and the fact that it is never-ending, points our attention toward the way in which the school itself is organized to facilitate teachers' individual and collective efforts to deepen their teaching knowledge, foster inquiry into student learning, and develop meaningful supports for all students.

Professional Community in Support of Teaching and Learning

At the very least, one must imagine schools in which teachers are in frequent conversation with each other about their work, have easy and necessary access to each other's classrooms, take it for granted that they should comment on each other's work, and have the time to develop common standards for student work. (Meier 1992, p. 602.)

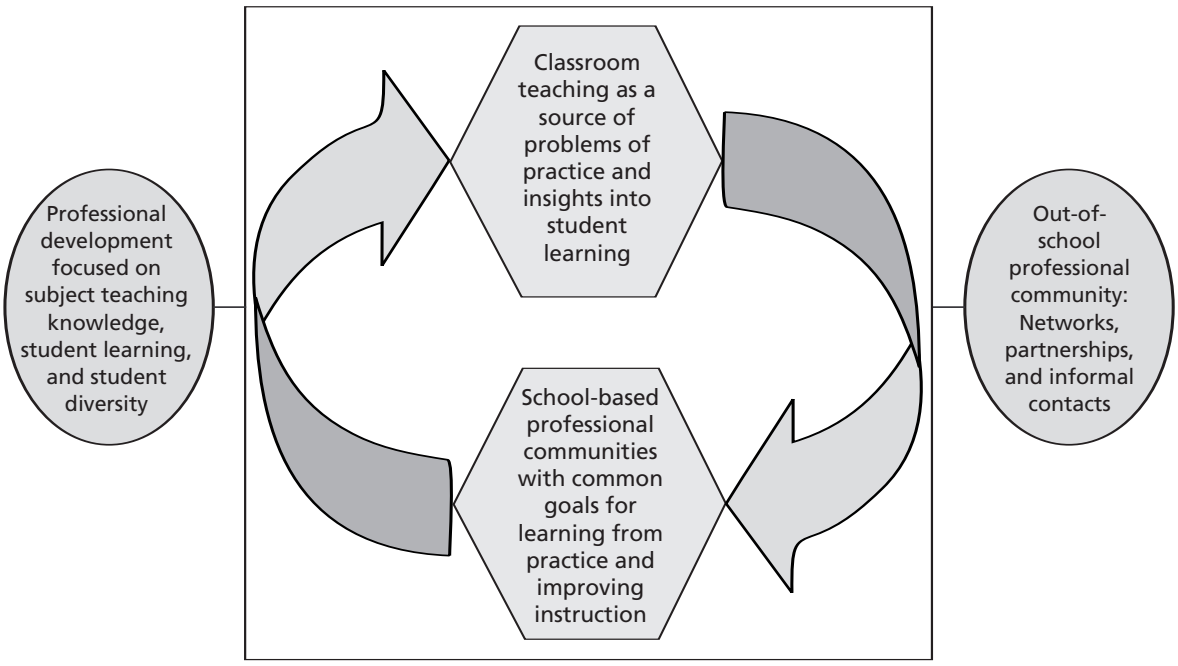
It does not take a newcomer long to take stock of whether the school's professional environment is consistent with professional learning. Although multiple workplace conditions play a part,[13] vigorous professional communities occupy a particularly central role in schools conducive to teacher learning. Ideally, professional communities within schools are fundamentally oriented to problems of classroom practice and linked to a variety of external sources of knowledge and support for teacher learning. As we turn from the content of professional development to consider the process or the means, Figure 2 provides a schematic overview that places school-based professional learning communities focused on problems of classroom teaching and learning at the center of a larger constellation of learning opportunities.

[11] Reviews by Banks and others (2005) and Cochran-Smith (1997) both offer numerous examples and citations to classroom research that spans several decades.

[12] Indeed, there is some evidence that professional development focused principally on teachers' awareness, attitudes, and sensitivity may have the unintended effects of reinforcing stereotypes (Grant 1991; Zeichner 1992; Zeichner and Hoeft 1996).

[13] For discussion of the broader range of workplace conditions that bear on professional learning opportunity and teacher retention, see Johnson and others (2004) and Little (1999).

Figure 2. Linking Professional Community and Professional Development



Source: Author.

What Professional Community Is and Why It Matters

As commonly used, the phrase *professional community* refers to close relationships among teachers as professional colleagues, usually with the implication that these relationships are oriented toward teacher learning and professional development. Although there are some variations from study to study in how researchers define and characterize professional community, most definitions encompass the elements shown in Box 1.

The image of professional community has its origins in research on teachers' workplace relationships and their relationship to school improvement. In one early example of such research, Little (1982) found that schools with "norms of collegiality and experimentation" were more likely to adapt successfully to a major change (court-ordered desegregation) and to record higher levels of student achievement than schools where teachers worked in isolation and where norms of privacy and noninterference prevailed. In the highly collegial and improvement-oriented schools, teachers talked frequently with each other about their teaching and how to improve it. They spoke in focused, specific ways about classroom practice and

Box 1. Defining Elements of Professional Community

- Shared values and purposes, including shared orientations to the teaching of particular subjects
- Collective focus on and responsibility for student learning, sometimes described as a "service ethic," with regard to students' learning and well-being
- Collaborative and coordinated efforts to improve student learning
- Practices supportive of teacher learning, including observation, problem solving, mutual support, and advice giving—sometimes summed up as "deprivatized practice and reflective dialogue"
- Collective control over important decisions affecting curriculum.

Source: Grodsky and Gamoran (2003); Louis and Kruse (1995); McLaughlin and Talbert (2001); Secada and Adajian (1997).

student learning; worked with each other to develop and share classroom materials; observed each other teach when possible; were open to giving and receiving advice; and participated together in professional development, helping one another learn new ways of teaching.

Other studies produced similar results, showing that schools benefited when teachers achieved high levels of collaboration and adopted a norm of "continuous improvement." Rosenholtz (1989) concluded that her sample of 78 elementary schools could be divided into "learning enriched" and "learning impoverished" schools based on the levels of collaboration, professional sharing, and advice-giving among teachers. Those in the learning-enriched category—with robust learning environments for teachers—were also more likely to have strong profiles of student achievement. Schools engaged in whole-school restructuring during the 1990s were also found to produce higher levels of student achievement where teachers formed a professional community oriented toward learning (Newmann and Wehlage 1995; Newmann and Associates 1996). [14]

Over a decade or so, educators and researchers have gradually shifted from a language of "collegiality" and "collaboration" toward language centered on notions of "community," linking a "community of learners" in the classroom and "professional community" among teachers. Of those who write about professional community, many have referred to Wenger's (1998) work on "communities of practice." As Wenger defined it, a community of practice exists when individuals are mutually engaged in a joint enterprise and over time develop a "shared repertoire of ways of doing things" (p. 49). Wenger described local communities of practice, but he also envisioned "constellations" of professional communities that link local communities together with broader networks in shared enterprises. An example might be a school professional community that is linked with a professional association and a university partner—all working together on a more challenging mathematics curriculum for the school.

Cultivating Professional Community for Teacher Learning and School Improvement

As the research on teachers' professional community has evolved and matured, it has tackled a series of questions of importance to school leaders: Are all forms of "professional community" beneficial for teachers, students, and schools? What conditions enable professional communities to form and be productive? What goes on inside teacher communities that provides resources for teacher learning? Each of these questions yields insights for cultivating professional community.

Distinguishing "Strong Traditional Community" From "Teacher Learning Community"

Much of the early research distinguished between collegial (strong) and isolating (weak) professional cultures and offered compelling portraits of how some collegial schools or groups successfully pursued improvement. However, in schools, as in other organizations or in society more generally, strong cultures are not necessarily innovative cultures. That is, groups or schools may prove to be "strong" from a social and political perspective (cohesive and adept at securing resources), but "weak" as sources of improvement in teaching and learning.

Based on extensive research in public and private secondary schools, researchers at Stanford's Center for Research on the Contexts of Teaching (CRC) found that professional communities vary in significant ways. McLaughlin and Talbert (2001) differentiated between a weak professional culture, where classroom work remains private and teachers "pass like ships in the night," and a strong professional culture in which teachers share a set of commitments regarding teaching and learning. They further distinguish between two types of strong professional community. In *tradition-oriented strong communities,* teachers unite to preserve their preferred conceptions of subject and pedagogy even in the face of student failure. Teachers in these groups are held together by conservative views of a subject discipline, school curriculum, and instruction, but display little in the way of collective responsibility for student learning. Teachers in *teacher learning communities* also share certain core views and commitments but take a more dynamic and flexible stance toward subject teaching and routinely question and challenge teaching routines when they prove ineffective with students. Such communities embrace collective obligations for student success and well-being and develop collective expertise by employing problem solving, critique, reflection, and debate (see also Gutierrez 1996; Horn 2005; Louis and Kruse 1995; Talbert 1995).

The CRC studies, other studies of whole-school reform (Newmann and Wehlage 1995; Louise and Kruse 1995), and analyses of large-scale data sets all point to a high standard

[14] A thorough review of this literature is beyond the scope of this paper. Taken more or less chronologically, some of the contributions include Little (1982, 1987, 1990); Rosenholtz (1989); Nias, Southworth, and Yeomans (1989); Little and McLaughlin (1993); Siskin (1994); Louis and Kruse (1995); Newmann and Associates (1996); Westheimer (1998); Grossman, Wineburg, and Woolworth (2001); McLaughlin and Talbert (2001); Achinstein (2002); Horn (2005).

for the kind of teacher learning community that is likely to boost student learning. In one analysis of a national data set, Lee and Smith (1995) found measures of staff cooperation to be unrelated to student achievement, even though a spirit of cooperation is no doubt desirable from a workplace perspective. However, student achievement in math and science was significantly higher in schools where teachers expressed what the authors termed *collective responsibility for student learning.* Collective responsibility was defined in terms of teachers' expressed view that it was their responsibility to ensure that students learned and to help prevent them from dropping out or failing.[15]

Moving from a Culture of Privacy to Teacher Learning Community

Creating and sustaining such a robust teacher learning community is no small matter. The available research, although relatively small in quantity, points consistently to certain perspectives and practices that must develop over time and to the leadership required to nurture them.

First, portraits of robust teacher communities show teachers at ease with disclosing their teaching dilemmas, discussing them in depth, and helping one another craft solutions to problems of teaching practice and student learning. In one recent study of teacher study groups ("critical friends groups"), looking closely at examples of student work became the means by which teachers gained a deeper appreciation for dilemmas that they and their students faced (Little and others 2003).[16] In one vignette,

> Shelby, a high school health/science teacher, provided two samples of a persuasive essay she had assigned as the culminating assignment in a mental health unit on violence and violence prevention. Shelby was not satisfied that the essays had captured what she had hoped students would learn from the unit. Her colleagues in the meeting, representing a wide range of subject fields, had all participated in professional development aimed at strengthening "writing across the curriculum." In examining the student essays, they began to realize that they had an incomplete grasp of what it meant for students to produce a persuasive essay—and for teachers to assign and assess one. A math teacher mused, "What comes to mind is how well do the students understand what is meant by a persuasive essay?" and seconds later, "…because I'm not clear what is meant by a persuasive essay…" Those dual themes—what *students* understood and what the *teachers* understood as "persuasive essay"— were picked up throughout the discussion, culminating in this exchange:
>
> *English teacher:* Do you think maybe the kids didn't get it?
>
> *Shelby:* Do you think maybe the *teacher* didn't get it?! (Laughter.)
>
> (Little and others 2003, p. 189.)

Second, teachers move toward more robust forms of teacher community if and when they find ways to air and explore disagreement, acknowledge their differences, and tolerate conflict. Grossman, Wineburg, and Woolworth (2001), reporting on a three-year study of a project involving high school English and history teachers, considered this "navigation of fault lines" pivotal in the teachers' gradual shift from what they termed *pseudo-community* to *authentic community.* In its initial stages, the authors said,

> A group may deny differences and proclaim a false sense of unity.… With the formation of community, differences among participants can be acknowledged and understood. With such recognition comes the ability to use diverse views to enlarge the understanding of the group as a whole. (p. 989.)

Finally, case study research suggests that teacher groups benefit from the kinds of leadership or facilitation that help build the conditions outlined above—the ease in disclosing problems and the disposition to dig into them, as well as a growing acceptance of teacher-to-teacher initiative on matters of practice. Grossman, Wineburg, and Woolworth (2001) noted that teacher communities become venues for cultivating teacher leadership. A comparable finding emerges from the study of critical friends groups cited above:

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[15] In this case, the term *collective* refers to the aggregate of individual measures, but commonality of views (a high mean level and low variance on the reported items) suggests that a shared norm may be operating. That is, teachers in such a school would expect one another to take responsibility for student learning and would disapprove of those who do not.

[16] For more detail on this case, see Curry (2003). For other examples of teacher groups developing the capacity for rich, productive conversation about teaching and learning, see Clark (2001).

> Where we saw evidence of group norms built on open discussion, constructive questioning and critique, it was where individuals took the initiative to establish a different kind of conversation—one in which people could push on ideas and practice while still being respectful of one another. (Little and others 2003, p. 190.)

Creating Resources for Learning inside Teacher Community

Not all schools or groups that are committed to learning and improvement necessarily possess or create resources sufficient to act productively on those commitments. Research that probes "inside teacher community" concentrates on trying to uncover the kinds of distinctive processes that characterize vigorous and effective teacher communities—those, such as Will Rogers Elementary School or Railside High School's math department, that demonstrably influence the quality of teaching and learning. Although this research remains in its early stages, it has begun to illuminate how even "collaborative" groups vary in the variety and density of resources that teachers marshal in their interaction with one another, and thus vary in their ability to sustain their focus on teaching practice and student learning. In one recent comparison among highly collaborative groups (Little and Horn, in press; Horn 2005), one group consistently emerged as a powerful site for teacher learning. What stood out in this group of math teachers—all teaching algebra in detracked classrooms—was the sheer density of human and material resources on which the teachers relied to focus their attention productively on teaching and learning. In their once-a-week after-school meetings, the teachers routinely drew on three kinds of resources that distinguished them from other collaborative groups of math and English teachers.

- *Expectations and routines for extended talk about teaching,* or what Horn (2005) has called "episodes of pedagogical reasoning." In particular, a routine called "check-in" served not only as a coordination function (where are we in the semester curriculum?) but also more importantly, as a problem-raising and problem-solving function for novice and veteran teachers alike (Little and Horn, in press). Problems raised by individuals ("I started the geo-boards today and it felt like mayhem. It felt like no one understood.") became the focus of further "unpacking" questions and extended talk about possible interpretations of the problem and approaches to solving it. On a novice teacher's "mayhem" problem, teachers talked about what might have produced students' unexpected response. Among the commentaries from veteran teachers was this one:

  > When they get upset and they seem to be off task and acting goofy, it usually is motivated by "I'm so confused and the last thing I want to do is admit I'm confused so I'm instead I'm going to find a way to distract myself or distract others so that I don't have to face the fact that I don't know how to do something." So I always try to sympathize. (I may pretend to) be mad, like "You guys aren't working! What are you doing?" And then I try to take a step back and think what are they afraid of, how can I make them feel comfortable with that fear, what can I say or do to make them feel like this is a safe place. And that usually takes me somewhere where it's never fully successful, but I see some successes and then that translates into other days that become more successful (Little and Horn, in press).

- *Frequent and purposeful use of curricular resources.* Teachers made active use of texts, binders of sample problems, manipulatives, and reference books, as they talked with one another about what and how they were teaching core concepts and how students responded. With a pile of transparencies ready at hand, they used the overhead projector to display problems and map out approaches to teaching them ("So this graphic up here sort of illustrates…"). They recorded and referred back to their own thinking about their goals for particular problems and their instructional strategies.
- *Plentiful, detailed examples of student work and teaching practice.* The face of the classroom was constantly present in the form of lesson plans, samples of student work, demonstrations and simulations of classroom teaching, teachers' accounts of student response in the classroom, teachers' thinking aloud in detail about future classes, and even references to their observations of one another's teaching.

Fostering Professional Community at Multiple Levels and Locations

Where might teacher community best be constituted if it is to foster professional learning and influence student learning? Huberman (1993) has speculated that

professional community seems most likely to take root in grade levels, departments, or teams "where people have concrete things to tell one another and concrete instructional help to provide one another—where the contexts of instruction actually overlap" (p. 45). Yet schoolwide improvement teams have also become widespread. One recent study suggests that the most productive stance might be to foster professional community at multiple levels, with different expectations about what it might accomplish at each level.

In a two-year study of one innovative elementary school, Stokes (2001) showed how the staff of Will Rogers Elementary School structured opportunities to offer precisely such multilevel inquiries. Each form of inquiry worked well to enable some kinds of learning or to tackle some kinds of problems but was less well suited to others. The entire school staff engaged in what Stokes described as "whole-school assessment of learning outcomes," developing common benchmark assessments of students' literacy learning and devoting a full week in midyear to examining the data. Inquiry at this level enabled the teachers not only to develop a common understanding of student progress in reading and writing but also to see that a gap remained in race-based patterns of differential achievement and opportunity. This form of inquiry had an important motivational effect but could not supply teachers with sufficient insight to attack the gap and gauge their effectiveness. For this, smaller groups of teachers designed action research projects that afforded an opportunity to experiment with changes in curriculum and instruction at grade level and to assemble evidence regarding the nature and extent of any change in student performance. This form of activity provided the kind of mutual support and peer pressure needed to persist with a difficult task. However, it also tended to expose teachers' own uncertainties and to reveal differences in teachers' beliefs about teaching and learning. It was within a third inquiry context, which Stokes characterized as "individual reflection with small-group support," that individual teachers created a more private, voluntary forum in which they took up their individual concerns and problems. This was the forum, Stokes reported, that "enabled teachers to 'say things you wouldn't say' in other settings" (p. 148).

Stokes (2001) emphasized that no one strategy for introducing and organizing inquiry satisfies all interests. No one approach encompasses all of the work of teacher learning and instructional improvement. Further, to develop this constellation of activities required that the staff develop both *normative* capacity ("the staff's collective embrace and enactment of values that support self-study as an important kind of learning") and *technical* capacity ("the structures, processes, knowledge, and activities by which the school staff does the actual work of inquiring into their practices") (pp. 150–51). These in turn required serious leadership work on the part of both the principal and the teachers. As Stokes observed, "inquiry generates powerful learning—but also guilt and conflict" (p. 153). Staff continually navigated a tension familiar to observers of (or participants in) professional community—the tension between individuality and the common good (Hargreaves 1993), or, put another way, between individual and collective autonomy (Little and McLaughlin 1993). The Stokes study suggests the kinds of benefit that might be realized by cultivating professional community in ways that promote sustained attention to student learning and teaching practice at multiple levels and locations in the school.

Making the Most of External Ties

Schools are busy places that easily become insular places. Individuals, organizations, and groups outside the school sometimes provide the stimulation and intellectual push needed to consider possibilities beyond those a school would come up with independently. The strongest and most generative professional communities appear to benefit from ties to external sources of ideas, material, and assistance. These include teacher-to-teacher networks, university-school partnerships, school networks, and special projects that join teachers with knowledgeable colleagues and inform them about new possibilities of import to their teaching.

The growing pressure on schools to reduce the persistent achievement gap heightens the significance of external ties. Elmore (2005) described two schools that most lay observers would say are good schools. The teachers worked hard, and students appeared engaged in learning. There was a sense of internal accountability, and a great deal of emphasis was placed on improving student performance and closing achievement gaps. The school staffs did everything they knew how to do. Yet, despite their efforts, after some initial gains, student performance went flat, and the schools were designated as "failing." To continue moving to higher levels of performance, according to Elmore, these schools needed external help and support for capacity building commensurate with the demands being placed on them. They needed help diagnosing and addressing crucial issues, such as raising the level of cognitive demand in lessons and improving program coherence.

In sum, robust teacher learning communities stand out for their relentless focus on student learning, student experience, and student success; their willingness to take (and tolerate) initiative on matters of teaching practice; and the value they place on the ideas, feedback, and resources they derive from ties to individuals, groups, and organizations outside the school. Such communities are well positioned as sites of ongoing teacher learning—and to seek and benefit from participation in well-designed professional development.

Linking Professional Development and Professional Community

At their best, high-quality professional development and vibrant teacher community intersect to form strong foundations for the learning-centered school. In one of the earliest studies of professional development and school-based professional culture, schools with strong, improvement-oriented professional communities were more likely to value and make use of coherent, long-term professional development offered by the district (Little 1984). This and other studies suggest that no matter how well designed a structured program of professional development, its track record of success in the classroom owes a debt to the quality of professional community and other supports at the school level (Wilson and Berne 1999; Stein, Silver, and Smith 1998; Little 1984).

At the same time, there is some indication that when a school supports teachers' participation in high-quality professional development, it may also strengthen professional community. In one recent summary of survey-based research (Grodsky and Gamoran 2003), the authors concluded:

> Positive effects of school-sponsored professional development on professional community obtain at both the school and individual teacher levels, suggesting that teachers who participate in school-sponsored professional develop benefit not only from their own participation, but from the participation of their colleagues as well. (p. 1.)

The authors also acknowledged that the relationship may be the other way around (i.e., professional community has an effect on participation in professional development).

Overall, then, both case study and survey research suggest that the relationships between professional development and professional community are likely to be reciprocal, with good professional development stimulating or strengthening professional community and professional community providing fertile ground for participation in professional development.

Schools might more deliberately and profitably link professional development and professional community by taking a two-part strategic approach. One element of the strategy focuses on investing time and money in teachers' access to high-quality professional development both inside and outside the school. Such investments represent a departure from the conventional stance, described by one review (Wilson and Berne 1999) as "a patchwork of opportunities—formal and informal, mandatory and voluntary, serendipitous and planned—stitched together into a fragmented and incoherent 'curriculum'" (p. 174). The second element focuses on creating the kind of teacher workplace in which teachers experience both structural supports for professional growth and an organizational culture or ethos conducive to professional learning. This element entails a mindset among school leaders that is consistently attuned to the importance of teacher learning and to the various ways in which learning opportunities might be constructed in the fabric of everyday work.

Investing in High-Quality Professional Development

Schools invest in teacher learning by prioritizing and subsidizing collective participation in formal programs of professional development, inside and outside the school, that meet the criteria outlined above. These programs or activities deepen teachers' subject-teaching knowledge; equip teachers to attend carefully to student thinking and to collect evidence of their learning progress; and prepare them to understand and respond to student diversity. Such investments might take the form of subsidized participation by groups or teams in one or more of the ways discussed below.

In-Depth, Sustained Professional Development in Selected Subject Areas

Teachers often reserve high praise for professional development that is sufficiently concentrated (as in summer institutes) and sufficiently sustained (periodic, continuous opportunities across a school year or years) to achieve new understanding and to develop new patterns of classroom practice. Specialized summer institutes range from one to three or more weeks, typically focused in the teaching of specific subject areas (e.g., writing or literature, math, science, and the arts) and sometimes involving a mix of

participants from schools, universities, or private industry. Such institutes and other long-term activities permit a measure of content depth together with the kinds of professional exchange that are rarely possible in other kinds of workshop settings. In addition, long-term professional development may involve partnerships with universities, reform organizations, or professional development providers.

School or Teacher Networks

Teacher collaboratives and networks grew in size, visibility, and influence during the 1980s and 1990s. Perhaps the most long-lived and widely known exemplar is the National Writing Project, but other well-documented examples exist in science, math, the humanities, and the arts. Lieberman and Miller (1996) posited that networks fill a need created "because schools are organized in ways that often do not encourage the kind of frank discussion that is necessary for inventing new modes of working with students" (p. 14). In these "intentional" but "borderless" learning communities, outside their own bureaucracies, teachers "find it easier to question, ask for help, or 'tell it like it is,' rather than be fearful that they are exposing their lack of expertise in a given area" (p. 15; see also Lieberman and Wood 2001).

Building Teacher Learning into the School Workplace

Schools join professional development and professional community by strengthening the various naturally occurring niches where professional community might flourish—grade level groups, departments, and teams—and by allocating time, space, and dollars to other kinds of activity that expand the opportunities for teacher learning in the course of ongoing school life. This element of the linking strategy rests on an important premise: that the most promising forms of professional development are those that engage teachers in the ongoing pursuit of genuine questions, problems, and curiosities, over time, in ways that leave a lasting mark on their thinking and practice. The following paragraphs, without constituting an exhaustive set of possibilities, indicate some of the most commonly described approaches to organizing teacher-to-teacher learning opportunities at the school level.

Teacher Study Groups for Inquiry into Teaching and Learning

Some schools, especially those affiliated with comprehensive school reform initiatives, have sought to anchor teacher learning in organized teacher study groups. In some cases, teachers are encouraged to frame research topics tied to school goals, priorities, or problems. In other cases, they are afforded complete independence in deciding what to investigate. Examples include the Critical Friends Groups initiated by the Coalition of Essential Schools, and the teacher study groups developed as an integral part of the Atlas Communities school improvement model.[17]

Lesson Study

Adapted from a well-established practice in Japanese schools, Lesson Study is a continuous cycle of action research organized by teachers to improve curriculum and instruction. It engages teachers in collaboratively planning a lesson on a key concept and in relation to shared goals and then observing, critiquing, and refining the lesson together. [18] The Standards in Practice (SIP) model, developed by the Education Trust, also focuses on an analysis of lessons in relationship to academic standards. On the premise that "students can do no better than the assignments they are given," the SIP process joins a review of student work with scrutiny of the corresponding classroom assignment (Education Trust 2003; see http://www2.edtrust.org/EdTrust/SIP+Professional+Development). Participants in school-based teacher groups bring an academic task and samples of the student work that resulted from it. They begin by completing the assignment themselves and then analyzing the learning demands embedded in it and the degree to which it is linked to relevant standards. Using the assignment and standards, they develop a scoring guide for assessing the student work and pose the question of whether a given sample of student work would "meet the standards." The eventual aim of reviewing student work is to turn attention back to instructional strategy—specifically to the design of appropriate academic tasks.

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[17] Although the volume of research is not large, the available studies point to conditions that make such groups more or less productive. For example, see studies of Critical Friends Groups by Nave (2000), Matsumura and Steinberg (2001), and Curry (2004). In addition, *The Journal of Staff Development,* published by the National Staff Development Council, has published numerous articles designed to help schools organize viable teacher study groups.

[18] The Lesson Study Research Group at Teachers College, Columbia University (http://www.tc.columbia.edu/lessonstudy/), has undertaken a set of case studies aimed at understanding the possibilities and problems of Lesson Study in American schools (Chokshi and Fernandez 2004; Fernandez 2002; Fernandez, Cannon, and Chokshi 2003; Fernandez and Chokshi 2002). For a list of the Research Group studies, see http://www.tc.columbia.edu/lessonstudy/articles_papers.html.

Protocol-Based Conversation about Student Work

By the late 1990s, various groups and organizations had begun to promote "looking at student work" as a focus for professional development.[19] Several have developed structured protocols to help teachers look closely at student work for evidence of student reasoning and understanding. Protocols are designed to stimulate and structure a conversation focused on what the work reveals about student reasoning and understanding. According to one online summary, "a protocol creates a structure that makes it safe to ask challenging questions of each other" (see Looking at Student Work, n.d., http://www.lasw.org/protocols.html). Research shows that protocols serve to organize and guide an unfamiliar and potentially threatening discussion—but the discussion may lose its generative edge when protocols are treated more like a script and less like a flexible resource, adaptable to teachers' own interests and goals. Further, most protocols in use are generic guides to process, taking no explicit account of the specific challenges of teaching and learning in subject-matter domains (Curry 2003; Little and others 2003). (An example of a subject-specific protocol is the Protocol for Looking at Student Work in Reading Apprenticeship Classrooms, developed by the Strategic Literacy Initiative at WestEd. (The protocol itself is unpublished; for project information and contacts, see http://www.WestEd.org/sli.)

Peer Observation

Classroom and school visitations figure prominently in teachers' accounts of "getting started" with new ideas—especially when teachers are able to visit several different classrooms (or visit one classroom on several occasions) and spend time talking with the colleagues whom they have visited. Further, regular and focused observation and real-time mentoring have been found to be important elements of effective teacher induction programs. Yet observing and being observed remain rare, and careful analysis of teaching episodes is even more so. In one national survey, more than three-quarters of teachers expressed faith in observation as a way to sustain reform—but fewer than half (47%) said they had actually participated in any form of peer observation (Holmes and others 1995).

Video Clubs

Video technology is a relatively underexamined resource for teachers' professional learning.[20] Although usually employed as part of formal professional development or preservice preparation, it also has promise for use in schools where teachers can rarely manage to observe one another in "real time." Video clubs demonstrate the benefit that teachers derive from a series of conversations focused on evidence from ongoing, situated classroom activity. Where teachers are able to refrain from a quick leap to judgment about one another's practice, and where deep conversations evolve, research provides testimony to the benefits. One recent study found that "over time, discourse in the video clubs shifted from a primary focus on the teacher to increased attention to students' actions and ideas. In addition, discussions of student thinking moved from simple restatements of students' ideas to detailed analyses of student thinking. Furthermore, teachers began to reframe their discussions of pedagogical issues in terms of student thinking." (Sherin and Han 2004, 163). Schools interested in this approach might find *Teaching for Understanding: A Guide to Video Resources* (Segal, Demarest, and Prejean 2006) a useful tool.

Conclusion

This paper builds selectively on the available research to suggest where schools might make important strides through investment in teacher learning. Its basic premise is that when a school systematically supports professional learning it is more likely to be effective with students. Schools that exhibit a high level of success with students, sometimes against considerable odds, tend to supply consistent portraits of work environments conducive to teacher learning. In these schools, teacher learning arises out of close involvement with students and their work; shared responsibility for student progress; access to new knowledge about learning and teaching; sensibly organized time; access to the expertise of colleagues inside and outside the school; focused and timely feedback on individual performance and on aspects of classroom or school practice; and an overall ethos in which teacher learning is valued and professional community cultivated. School leaders could go some distance toward creating such an

[19] The Annenberg Institute for School Reform, together with the Chicago Learning Collaborative, Harvard Project Zero, and the Coalition of Essential Schools, has developed Web pages and practical guides to help teachers collaboratively examine student work. For an example, see the Web site http://www.lasw.org (Looking at Student Work, n.d.) and Allen and Blythe (2003); Blythe, Allen, and Powell (1999); Seidel and others (2001); Weinbaum and others (2004); and McDonald (2001).

[20] Some of the earliest examples of video clubs were formed to aid the National Board for Professional Teaching Standards as it developed criteria and processes for assessing videotape samples of teaching practice (e.g., Frederiksen and others 1998). Since that time, video has emerged as a more integral part of preservice and in-service teacher education (Lampert and Graziani 2003; Sherin and Han 2004; Sherin, in press).

environment by generating professional community, promoting and organizing activity that sustains a focus on teaching and learning, and ensuring that other workplace conditions enhance rather than impede teachers' professional development and commitment to teaching.

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