Models for Effective and Scalable Teacher Professional Development

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Abstract

The minute-to-minute and day-by-day use of assessment for learning holds great potential to change the trajectory of student learning in U.S. classrooms. But without effective and scalable systems of professional development that actually lead teachers to adopt these practices, the utility and impact of assessment for learning will be quite limited. Drawing on learning theory, expertise research, and research on effective professional development, this paper presents the theoretical and empirical basis behind an evolving program of professional development that employs school-embedded teacher learning communities as a central component, called *Keeping Learning on Track*®. Implementations of the *Keeping Learning on Track* program in two districts and a consortium of districts are described in detail.

Key words: Assessment for learning, professional development, teacher learning communities

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Introduction

Evidence of the effectiveness of assessment for learning (sometimes referred to as formative assessment) is convincing and steadily accumulating(for reviews of research, see Black & Wiliam, 1998; Borko, 2004; Brookhart, 2005). Furthermore, many assessment for learning techniques involve relatively small changes in teaching practice that can leverage large improvements in student learning (Ciofalo & Leahy, 2006; Leahy & Wiliam, 2006; Lyon, Wylie, & Goe, 2006; Wylie & Ciofalo, 2006). The teaching techniques that enact the five strategies and big idea of assessment for learning (Leahy, Lyon, Thompson, & Wiliam, 2005) are decidedly low tech, low cost, and within the capabilities of individual teachers to implement. In this way, they differ dramatically from large-scale interventions like class size reduction or curriculum overhauls, which can be quite expensive and difficult to implement because they require school or system-level changes. Taken together, these points suggest that assessment for learning holds great potential to change the trajectory of student learning in U.S. classrooms.

Given the reported effectiveness, low cost, and relative ease of implementation of assessment for learning, it is fair to ask why it is not already more widely understood and practiced. One reason is that using this approach thrusts teachers and students into new, sometimes challenging roles that require changes to the everyday routines of most classrooms (Brousseau, 1997). Other substantial cognitive and behavioral shifts are required of teachers as well, such as the shift from an emphasis on teaching to an emphasis on learning, a shift in assessment mindset from quality control to quality assurance, and a blurring of the boundaries between instruction and assessment (Leahy et al., 2005).

For teachers to wholeheartedly take on the new roles and new paradigms that assessment for learning requires of them, they need more than just a quick exposure to its principles and methods. Many teachers have a great deal of the required knowledge and skills to understand and implement assessment for learning strategies once they are exposed to these ideas, but they need sustained opportunities to consciously develop, practice, reflect upon, and refine this skill set so that it works within the context of their own classrooms. Mandated state standards, testing, pacing guides, and scripted curricula have left many teachers feeling divorced from goal setting and assessment, core practices in assessment for learning. These teachers need more: In addition to opportunities for learning, practice, and reflection, they also need experiences that explicitly

counteract the isolation, frustration, and de-professionalization that have occurred in many school faculties.

Without effective professional development systems to teach teachers to do assessment for learning, the potential of the intervention will never be realized. By effective, we mean that the professional development leads to observable, measurable improvements in teaching practice, a requisite step toward improving student learning. The sad truth is that most professional development going on in U.S. schools is not effective, by this definition. The challenge is to develop models of professional development and scalable systems of delivery that faithfully disseminate the content of assessment for learning, while also providing sustained, meaningful assistance to teachers who are attempting to replace long-standing (perhaps unconscious) practices with more effective ones.

In this paper, we describe how researchers at ETS applied the general notion of school-embedded teacher learning communities as a central component of an assessment for learning professional development program called *Keeping Learning on Track*®. As part of the development process for *Keeping Learning on Track*, we piloted a range of delivery models across numerous schools and districts. We focus here on three delivery models employed in two districts and a consortium of districts. We compare and contrast the delivery models in light of each model's impact on teaching practices and scalability. The data we consider span 2 years of our development process, with greater emphasis on our experiences in the current school year (2005–2006). Because the data are still coming in, we are able to report only preliminary findings at this time. However, these findings are sufficient to guide us in developing a tentative framework for the most effective methods for establishing, maintaining, and promulgating teacher learning communities as a vehicle for spreading and deepening teachers' work in assessment for learning.

Why Teacher Learning Communities?

The Need to Attend to Both Content and Process

A growing body of research shows that to be successful, teacher professional development needs to address both *content*[2] and *process* aspects of teacher growth (Reeves, McCall, & MacGilchrist, 2001; Wilson & Berne, 1999). The *content* of *Keeping Learning on Track* is focused equally on two ideals. First, it seeks to change the day-to-day instructional practices of teachers to include extensive use of five key strategies of assessment for learning:

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1. Engineering effective classroom discussions, questions, and learning tasks that elicit evidence of learning.

2. Clarifying and sharing learning intentions and criteria for success.

3. Providing feedback that moves learners forward.

4. Activating students as the owners of their own learning.

5. Activating students as instructional resources for one another.

Second, it incorporates one big idea that unifies and motivates all these strategies—that information about student learning should be used to adapt instruction in real time to meet the immediate learning needs of students. *Keeping Learning on Track* is a direct descendent of the British research on assessment for learning conducted by Black and Wiliam (1998) and Black, Harrison, Lee, Marshall, and Dylan (2002, 2003). The strong framing provided by the five strategies and one big idea, plus the various techniques that have been developed for their implementation, provide sturdy content for professional development. See Leahy et al. (2005) for more on the theory and practical application of the five strategies and one big idea of assessment for learning in U.S. schools.

The primary *process* by which *Keeping Learning on Track* attempts to effect these changes in teachers' practice is via school-embedded teacher learning communities, which have the potential to provide teachers with the information and support they need to develop their practice in deep and lasting ways, and are designed to build school capacity to support individual and institutional change over time.

Teacher Expertise

Teacher learning communities embody critical process elements needed for professional development to result in actual changes in teacher practice. Specifically, effective professional development is related to the local circumstances in which the teachers operate (Cobb, McClain, Lamberg, & Dean, 2003), takes place over a period of time rather than being in the form of 1-day workshops (Cohen & Hill, 1998), and involves teachers in active, collective participation (Garet, Porter, Desimone, Birman, & Yoon, 2001; Ingvarson, Meiers, & Beavis, 2005).

Of course, many professional development structures would be consistent with this research base, but we believe that teacher learning communities, as advocated in the *Standards*

for Staff Development under the name *professional learning communities* (National Staff Development Council [NSDC, 2001]), provide the most appropriate vehicle for helping teachers become skilled practitioners of assessment for learning.

We were initially propelled toward this conclusion by personal experience with an earlier, failed model of assessment for learning professional development, which did not provide adequate, contextualized, sustained support for teacher change. As we internalized the lessons of that earlier effort, we looked closely at the growing evidence base on how to build and sustain teacher learning communities (Borko, 1997, 2004; Borko, Mayfield, Marion, Flexer, & Cumbo, 1997; Elmore, 2002; Garmston & Wellman, 1999; Kazemi & Franke, 2003; McLaughlin & Talbert, 1993; Putnam & Borko, 2000); Sandoval, Deneroff, & Franke, 2002). We noted a pattern in this literature: If teachers' practices are recurrent, central, and entrenched within everyday teaching and school culture, then teachers will need sustained support to change those practices. Not only must the support be sustained over time (a year or longer in many of the studies cited above), that support must also embed teachers' learning within the realities of day-to-day teaching in their own schools and classrooms, allowing for repeated cycles of learning, practice, reflection, and adjustment within their daily context.

To some extent, these cycles map onto the cyclical depiction of knowledge creation and knowledge transmission of Nonaka and Takeuchi (1995), wherein the tacit knowledge of a person or group is turned into explicit knowledge so that it can be taught to another person or group. Until the new knowledge is practiced and made operational (through a process labeled *learning by doing*, in Nonaka and Takeuchi's framework), the knowledge remains explicit. Only through sufficient learning by doing can that knowledge be combined with existing knowledge structures, internalized, and made accessible and useful in relatively seamless ways (essentially making the knowledge tacit again). Nonaka and Takeuchi's framework seems particularly apt in this application because of its treatment of learning as situated in a social milieu, which is certainly characteristic of teacher learning.

The seamless, transparent, and highly accessible quality of internalized tacit knowledge is one of the distinguishing features of expertise, in any field, and assessment for learning is no different. An expert in assessment for learning is able to rapidly note essential details of the complex social and psychological situation of a lesson (especially the state of student learning), while disregarding distracting, yet nonessential details. He or she is then able to swiftly compare

that situation with the intended goals for the lesson, the knowledge of the content being taught, the developmental knowledge of students in general and these students in particular, and other relevant schema. Guided by the results of these comparisons, the expert then selects his or her next instructional moves from a wide array of options—most well-rehearsed, some less familiar, and some invented on the spot—so that these next steps address the students' immediate learning needs in real time.

Such expertise is certainly marked by the speed of cognition, but more is needed than speed alone. Expert teachers don't just think faster than nonexpert teachers; they think and behave in qualitatively different ways. This behavior has been borne out in the work of Berliner (1994), who documented eight ways that expert teachers function like experts in other fields. For example, Berliner notes that expert teachers perceive meaningful patterns in the domain of their expertise where nonexperts cannot.

The story of how Berliner came to understand this particular feature of expert teaching is instructive and directly related to the need for teachers to practice and reflect upon teaching in real contexts. In the early 1990s, he produced a series of videotapes depicting common teaching problems in staged classroom settings. When he showed these tapes to novice teachers, experienced-but-nonexpert teachers, and expert teachers, he expected the experts to be able to describe the videotaped interactions in rich detail and provide plausible, nuanced solutions to the problems revealed. Instead, they found that the experts were completely stymied by the videotapes, whereas the novices and other nonexperts were able to converse at length about what they had seen (though not necessarily cogently or plausibly). Through conversations with the expert teachers, he discovered that the staged depictions felt realistic only to nonexperts. Subtle but essential details of real classroom life were either absent from the staged depictions or out of sync. The nonexperts did not miss or notice these. Without these subtle details in their proper place, however, the experts were thrown off in their search for meaningful patterns; they couldn't even begin to make sense of what they were seeing because it did not map onto their relatively dense knowledge webs concerning what goes on in teaching and learning in a real classroom. When the staged videos were replaced with videos filmed in real classrooms, the experts were easily able to respond with detailed, nuanced, cogent, and plausible descriptions and prescriptions—even though the technical quality of these spontaneous videos sometimes made it difficult to hear and see all the relevant action.

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This same kind of observation and pattern-matching is an integral part of the teacher's role in assessment for learning, as it is for most complex teaching behaviors. Learning to do assessment for learning requires the development of expertise, not the rote application of declarative or procedural knowledge. For this reason, we sought a learning vehicle that would support the kind of socially supported knowledge creation and transfer described by Nonaka and Takeuchi (1995) to feed the development of teacher expertise in general and expertise in assessment for learning in particular. Teacher learning communities seemed to have potential to accomplish this goal and to represent a learning modality that could be scaled to reach many, many teachers in all kinds of schools.

Are Teacher Learning Communities the Only Way to Go for Professional Development in Assessment for Learning?

Though the idea of teacher learning communities is usually warmly greeted by teachers—who generally wish for more collegiality in their professional lives—we did not elect to employ them just to be nice to teachers; we chose this vehicle because it is the only one we've found that works to change teachers' practices. We arrived at teacher learning communities as a central (though not exclusive) learning vehicle for Keeping Learning on Track through a combination of experience and our theory-based search for a way to provide contextually relevant, socially mediated learning opportunities to teachers.

We were also attracted to teacher learning communities for *Keeping Learning on Track* because the grassroots character of learning communities lends itself to scaling up the intervention. As Black et al. (2002) noted, few teachers make use of assessment for learning in day-to-day teaching. Once the notion that it would be good for teachers to do more of this kind of teaching is accepted, then the need for professional development is tremendous and the issue of scalability rises to crucial importance. Devising a program of professional development that works effectively when delivered by its original developers and their hand-picked expert trainers is not enough. Where would we find (and how would we pay) the army of experts needed in the 100,000-plus U.S. schools that could benefit from assessment for learning? There simply are not enough qualified coaches and workshop leaders to be found, and the mechanisms for disseminating learning through such top-down models are dauntingly complex and expensive.

Serious challenges will be involved in bringing teacher learning communities to scale with fidelity to the original assessment for learning content, given that we must assume that no

experts (at least not at the outset) will be part of any particular learning community. We contend that this design issue must be faced squarely, and in this paper we will discuss how we did so in the various delivery models with varying degrees of success.

Based on the organizational change literature (Hendry, 1996; Schein, 1996; Stace, 1996) and research on school reform (Cobb et al., 2003; Coburn, 2003; Joyce, 2004), institutionalization of the intervention within the structures and cultures of schools will greatly strengthen the potential for assessment for learning to lead to improved student achievement on a wide scale. But until institutionalization occurs, a bootstrapping problem must be addressed. It appears that teacher learning communities might be a feasible way to both home-grow assessment for learning expertise and foster school cultures that are more amenable to their institutionalization.

Teacher learning communities seem to be particularly functional vehicles to support teacher learning about assessment for learning in several ways. First, the practice of assessment for learning depends upon a high level of professional judgment on the part of teachers, so it is consistent to build professional development around a teacher-as-local-expert model. Second, school-embedded teacher learning communities are sustained over time, allowing change to occur developmentally, which in turn increases the likelihood of the change sticking at both the individual and school level. Third, teacher learning communities are a nonthreatening venue allowing teachers to notice weaknesses in their content knowledge and to get help with these deficiencies from peers. For example, in discussing an assessment for learning practice that revolves around specific content (e.g., by examining student work that reveals student misconceptions), teachers often confront gaps in their own subject matter knowledge, which can be remedied in conversations with their colleagues.

In a related vein, teacher learning communities redress a fundamental limitation of assessment for learning: its (perhaps paradoxical) generality and specificity. The five assessment for learning strategies are quite general; we have seen each of them in use at every level from pre-K to graduate-level studies, and across all subjects. Yet implementing them effectively makes significant demands on subject matter knowledge. Teachers need strong content knowledge to ask good questions, to interpret the responses of their students, to provide appropriate feedback that focuses on what to do to improve, and to adjust their teaching on the fly based on the information they are gathering about their students' understanding of the

content. A less obvious need for subject matter knowledge is that teachers need a good overview of the subject matter in order to be clear about the big ideas in a particular domain, so that these ideals are given greater emphasis. Teacher learning communities provide a forum for supporting teachers in converting the broad assessment for learning strategies into lived practices within their specific subjects and classrooms.

Finally, teacher learning communities are embedded in the day-to-day realities of teachers' classrooms and schools, and as such provide a time and place where teachers can hear real-life stories from colleagues that show the benefits of adopting these techniques in situations similar to their own. Without that kind of local reassurance, there is little chance teachers will risk upsetting the prevailing classroom contract (Brousseau, 1997); while limiting, the old contract at least allows teachers to maintain some form of order and matches the expectations of most principals and colleagues. As teachers adjust their practice, they are risking both disorder and less-than-accomplished performance on the part of their students and themselves. Being a member of a community of teacher-learners engaged together in a change process provides the support teachers need to take such risks.

Who Should Lead Teacher Learning Communities?

Expertise in assessment for learning is developed when teachers learn by doing. It can only be developed in those who have ample opportunity for practice, reflection, and adjustment—teachers. Just as chess masters need to play a lot of chess to become expert at chess, teachers also need to practice assessment for learning to become expert at it.

Coaching by curriculum coaches or building principals is a common model for school-based professional development. However, its utility for advancing assessment for learning is limited unless the coach has previously developed expertise in assessment for learning through use and refinement in his or her own classroom. We cannot assume that any majority of coaches and principals developed this expertise before they left the classroom. This is not to say that coaches and principals can play no useful role in supporting teacher learning communities focused on assessment for learning, but we do think they should refrain from holding themselves up as experts, unless they have walked the walk.

While we have not had a chance to make a formal study of learning community leadership, a cursory review of the results we have seen to date suggests that teachers themselves can provide effective leadership for their peers. Because they are going through the same

learning and change process, they have essential insights into the pace of change, the kinds of dilemmas faced, and the types of support that make sense, all within the context of the classroom, not just the building. When we place teachers in the leadership role, we caution them not to assume any extra expertise just because they are the facilitator and advocate for the teacher learning community, which is often a relief to them because they do not want to hold themselves above their peers or feel pressured to act like they know more than they do. They want the breathing room to ask for help in the places they are struggling.

Are Teacher Learning Communities the Only Way to Go for Professional Development?

Teacher learning communities are certainly catching on, with federal and state education policy now moving to acknowledge that these kinds of embedded, teacher-driven, drip feed approaches can be an effective way to shift teacher practice. (See, for example, Division of Abbott Implementation, 2005; Librera, 2004; North Carolina Department of Public Instruction, 2005; U. S. Department of Education, 2005). We note, however, that implementing teacher learning communities consistently and effectively is not as simple as changing federal and state regulations and funding frameworks for professional development.

Significant structural barriers to teacher learning communities exist in many schools, including daily and weekly schedules that provide little or no time with colleagues during the normal school day, personnel policies and practices that do not recognize or value teacher expertise, local bargaining agreements that discourage teachers from meeting outside scheduled hours, inadequate resources to support teacher time away from the classroom, competing demands on teacher time, and school cultures that do not easily align with the needs of sustained, school-embedded, collegial work with colleagues. One of the goals of this paper is to examine the question of whether teacher learning communities in support of assessment for learning are still effective and worth pursuing, given these challenges.

Given the steep institutional challenge associated with mounting teacher learning communities, it is important to say that we are not endorsing teacher learning communities as a one-size-fits-all solution for all teacher learning. Rather, we are endorsing a more flexible concept, one of matching the nature of the content to be learned with learning processes that are appropriate for that particular content. Where the content to be learned draws on the kinds of complex cognition and behaviors that are typical of experts, then we would argue that teacher learning communities provide a suitable, and perhaps a necessary, learning modality. Other kinds

of teacher learning, however, are probably best dealt with in other ways. For example, if the goal is to boost teachers' subject matter knowledge, then learning vehicles that put teachers in close contact with expert sources (e.g., professors, texts) may be more efficient than exploring that subject matter with colleagues who are not experts in that realm. If the knowledge to be learned is procedural and highly standardized (for example, learning to use new grading and record-keeping software), then a workshop learning experience will be faster, cheaper, and more likely to result in uniform compliance.

Professional Development in Assessment for Learning and Teacher Learning Communities
Our Starting Point: Assessment for Learning

Like most professional development programs, ours began by developing and trying out workshops in which we focused on the thing we wanted teachers to do. In our case, this meant we piloted, refined, and repiloted multiple versions of workshops focused on assessment for learning. Through the development process, we became more familiar with this content, to the extent that we were able to move away from a telling format in which we spent a great deal of time lecturing teachers about what it is and how to do it, toward a more interactive format in which we employed and modeled the very learning principles upon which assessment for learning is based.

In the first year of our development process, the amount of content we felt we needed to cover grew to fill three full days. Later, we came to see that there was a limit to what teachers could effectively take in without opportunities for practice, reflection, and adjustment, so we shortened the workshop to two days. Sometimes we delivered the workshop days consecutively, and sometimes we spread them out, asking teachers to try out techniques in between. Recognizing the need to move the knowledge that was in the development team's head to a more scalable format, we codified the workshop content in PowerPoint slides supported by highly detailed leader notes that include discussion points, timing indicators, and all needed materials. This resource is a valuable tool for trainers and district staff learning about the program.

Two Content Strands: Assessment for Learning and Establishing and Sustaining Teacher Learning Communities

Experience in the first districts we worked in taught us about the importance of institutionalizing ongoing support for teacher learning. This experience led us to understand that

we needed to explicitly address two distinct content strands in our professional development: assessment for learning and teacher learning communities. It's interesting to note the staggered pace of our own learning about the need to attend explicitly to both areas. At first, we included about 20 minutes (within a 3-day workshop focused on assessment for learning) about the need for ongoing support for teachers in the form of teacher learning communities. This amount of time proved to be ineffective: we saw first hand that simply telling schools to set up teacher learning communities was not sufficient, just as simply telling teachers how to do assessment for learning was not effective.

We then began building a 1-hour segment on teacher learning communities into the initial teacher workshop and created a separate workshop focused entirely on the why's and how's of teacher learning communities, directed at those charged with leading them and the school leaders who are charged with making way for them. This addition proved to be more effective, but still not sufficient. As it turns out, sustaining a teacher learning community has its own complexity and context-driven peculiarities, much like assessment for learning. In most schools, there simply isn't enough existing know-how and cultural readiness to sustain these communities, even if school leaders get them off the ground.

This knowledge eventually led us to understand that learning to do teacher learning communities required the development of expertise and thus would benefit from opportunities for learning, practice, reflection, and adjustment, just like teachers need to learn how to do assessment for learning. In both content areas, we were asking teachers and other school personnel to change deeply-held beliefs and practices, and we were challenging long-standing institutional roles for teachers and students. Just as an implicit classroom contract exists, an implicit school contract also exists, and that contract has not, historically, supported teachers to be learners. We began looking for ways to provide ongoing support to develop the expertise of teacher learning community leaders and the school leaders who must help them carve out space and time.

Two Learning Phases: Initial Exposure/Motivation and Ongoing Learning

We came to see that both content areas—assessment for learning and teacher learning communities—can be effectively addressed in two distinct phases: (a) initial exposure and motivation, and (b) ongoing learning, practice, reflection, and adjustment. In Phase 1, the teacher or school leader is exposed to an overview and basic information about the topic through a

workshop or seminar presented within a motivational framework so that he or she can see the advantage of making a longer-term commitment to changing his or her practice. To motivate assessment for learning, we generally rely on compelling research that shows the student learning gains that can be obtained by becoming expert at it. For teacher learning communities, we cite both research and teachers' own experiences with the limited effects of one-off workshops and then make a logical argument for sustained, collegial learning.

Without Phase 1, most teachers would not know where to begin or even see that they needed to begin. But in fact, it is in Phase 2 that the learning has the potential to actually change teaching, learning, teachers, and schools. Phase 2 is analogous to Nonaka and Takeuchi's (1995) learning by doing stage, the stage where the knowledge learned at an explicit level is translated into tacit knowledge that is accessible and applicable in practice in increasingly transparent ways. Opportunities for learning the next thing to be learned, practicing it in real settings, reflecting on how and why it worked or didn't work, and adjusting and integrating the new learning have to be structured. Otherwise, the pace of teaching and daily life in schools do not naturally allow teachers and school leaders to develop expertise in complex interventions like assessment for learning or teacher learning communities.

Structuring Ongoing Learning About Assessment for Learning

At the start of the second year of our development process, we attended to structures for supporting ongoing learning about assessment for learning by creating *modules* for use by facilitators of teacher learning communities. These modules, comprised of directions and materials for 105 minutes of group study of assessment for learning, represent one of strongest attempts to scaffold in enough content to maintain fidelity, one of the challenges of using teacher learning communities to scale up any intervention. Recognizing that no assessment for learning experts exist in most teacher learning communities, each module provides explicit guidance for the conduct of a monthly teacher learning community meeting. Each module contains an agenda, detailed leader notes with guidance for timing and discussion points, plus informational and activity handouts to be photocopied for the use of participants.

Every module begins and ends the same way, with what we have come to call the *bookend activities*. These activities are designed to provide the supportive accountability that teachers need to take the risk of making changes in their teaching practice.

- In order to model and gain the benefit of the assessment for learning strategy called clarifying and sharing learning intentions, each module begins and ends with a clear statement of the meeting's learning intentions.

- Every module then moves to the How's It Going?, a segment that allows time for every teacher to report on and ask for feedback and help on their most recent experiences trying out assessment for learning techniques. Knowing that they will be expected to report on their most recent efforts was shown in (Paul Black, Harrison, Lee, Marshall, & Wiliam, 2003) to be a helpful, even necessary, spur to action.

- Near the close of each module, a segment is devoted to personal action planning, a time for teachers to describe on paper their next steps in trying out and refining assessment for learning techniques in their own classrooms. The Personal Action Planning segment includes time to make arrangements to exchange observation time in colleagues' classrooms or to collaborate with colleagues in other ways, perhaps to generate hinge-point questions for key concepts or to practice writing effective formative comments on student work. The expectation conveyed in this segment is that between meetings, teachers are to try out assessment for learning techniques in their classrooms. With this kind of between-meeting effort and the support of colleagues, teachers can gain progressively more skill and insight into how to improve student learning through assessment for learning.

- Each module ends with a quick look back at the learning intentions, in which the group as a whole decides whether these were achieved, and if not, plans how to redress that problem.

Our goal in repeating these particular opening and closing activities in every meeting is to create a climate and expectation of both support and accountability. By emphasizing these two concepts together, we hope to convey that ongoing teacher learning is worthy and necessary, that teachers are expected to work on improving their practice on an ongoing basis, and that they will be supported to do so. We believe that accountability is an important and useful tool in any organization. However, many teachers feel alienated from the concept of accountability, due to pervasive, test-heavy accountability measures that are often out of balance with capacity-building measures. To recapture the concept of accountability and put it in service of improving

teacher effectiveness, we have made the capacity-building component explicit in the way we structure teacher learning communities.

In addition to the repeated bookend activities, each module also includes a teacher learning activity that is designed to deepen teachers' knowledge of a particular assessment for learning strategy and introduce one or more associated techniques illustrated by stories of how real teachers have made this strategy come alive in their classrooms. As a general rule, each module addresses only one of the five strategies or the big idea of *Keeping Learning on Track* to keep a clear focus for the meeting. This information is usually embedded in group activities that require teachers to reflect on their current practices and figure out how they might adapt these latest techniques to their own classrooms.

To date we have fully developed, pilot-tested, and refined eight modules, one to support the first meeting of a teacher learning community, and the remainder addressing the five strategies and one big idea of assessment for learning. Eight more are under development; these will get into the more challenging applications of assessment for learning (e.g., grading policies) and the underlying themes of assessment for learning (e.g., implications of changing the prevailing classroom contract between teachers and students). Our goal is to provide enough modules to support a rigorous 2-year course of study for a teacher learning community. Our hope is that after 2 years, participants will have adopted two habits of mind: (a) a student-learning focus will have replaced a focus on teaching as the sine qua non of teaching, and (b) teachers have a sense of themselves as a life-long researcher of their own craft.

Structuring Ongoing Learning About Establishing and Sustaining Teacher Learning Communities

The development, pilot testing, and refinement of the assessment for learning modules goes a long way toward ensuring that when teacher learning communities meet they maintain a strong and faithful focus on helping teachers adopt and improve the implementation of assessment for learning strategies and techniques. We thought that these modules might provide an adequate level of support for establishing and maintaining effective teacher learning communities. However, we learned that in most districts, the modules by themselves are not sufficient, because their availability does not ensure that the teacher learning communities will, in fact, meet. As we mentioned earlier, numerous structural and cultural barriers must be overcome to establish and nurture a teaching learning community.

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The single greatest problem is the lack of time within regular school hours when teachers can meet to discuss teaching and learning or observe each other's classrooms. Without this time during the regular, paid day, teacher learning communities can never hope to be attractive to the vast majority of teachers. Teacher learning community leaders and school leaders have to work together to communicate and demonstrate that the teacher learning community is a priority, and to do this, they need two things. First, they need some level of knowledge of the research base supporting teacher learning communities, for leverage when arguing for time and resources. Much of this knowledge base exists in an explicit form that can be conveyed in the initial exposure workshop, backed up by printed reference materials. Second, what learning community leaders need on top of that are ongoing, structured opportunities for new learning, practice, reflection, and adjustment.

In the current school year, we have finally had the time and opportunity to begin development of these structures. In one district's implementation (described below), a monthly, day-long workshop is required for all the teacher learning community leaders in the district (roughly 40 in this ambitious implementation). At this monthly workshop, the teacher learning community leaders function in two roles successively: first, as teachers learning about applying assessment for learning in their own classrooms, and second, as advocates and facilitators for teacher learning communities. For each role, time is set aside to reflect on successes and challenges, and to plan for next steps. The general framework employs the same principle of supportive accountability that is used in the modules. In their roles as leaders of teacher learning communities, the teacher-leaders are provided with a School Action Planning protocol. They are also given time to work together as they digest the content and processes of the upcoming assessment for learning module.

A Comparison of Three Delivery Models

We began working with schools and districts on early versions of our assessment for learning professional development program (before it was even called *Keeping Learning on Track)*, in the 2003–2004 school year. In the 2 successive school years, we have worked with 30 districts and hundreds of schools. Some districts have been quite large, with about 150 schools, whereas others have been quite small, with only 1 to 5 schools. We have worked in affluent suburban districts, and impoverished urban districts, with teachers at every grade level and

subject. Along the way, our understanding of what was required to support teachers to make significant, sustained changes in their practice evolved to the elements described above.

In the rest of this paper, we will focus on implementations delivered in two districts and one consortium of districts, which collectively illustrate the stages of development of our own thinking and how the design of the program evolved over time. General characteristics of the districts and the consortium are summarized in Table 1, which uses pseudonyms for each locale and omits the state of the large urban district to reduce the probability of recognition.

In each of these implementations, the terms, nature, and frequency of our engagement with schools and teachers varied for three reasons:

- We were at different stages of our development process when we began working in the different districts. In the early years, we had not yet developed the notion or the content of the teacher learning community modules. It was only in the recent period that we began developing the ongoing support systems for teacher learning community leaders and school leaders.

- We were pursuing different research goals in different districts at different times. Our early focus was on teaching teachers about assessment for learning, but as time went on we became equally interested in teaching teachers and other school personnel about teacher learning communities. We also were willing to provide nonscalable professional development in one close-at-hand district in exchange for greater access to teachers for interviews and observation.

- We became more skillful over time about how to negotiate firm commitments from schools and districts regarding their ongoing support for assessment for learning, teacher learning communities, and providing us with data.

- These varying circumstances led to different implementations, or delivery models, in the three locations. Though the implementations were not deliberately designed to systematically test all possible variations, they represent a range of delivery models that afford insight into factors affecting impact on teaching practices and scalability. In the next sections of the paper, we examine these differences with regard to the components that were implemented in each locale and their relative impact and scalability.

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Table 1

Characteristics of Districts and Their Implementations of Keeping Learning on Track

	Gateway district	Consortium	Corolla district
Type	Single district	18 Districts	Single district
Location	New Jersey	New Jersey	Midwest
District size	Small	Small to medium	Large
Population served	Middle class	Middle to upper middle class	Poor and working class
Date research partnership began	Fall 2004	Summer 2005	Fall 2005
Duration of partnership	2 years	1 year	1 year
District support for initiative	Moderate	Weak	Strong
Level of teacher contact with AfL experts	High	Low	Low
Initial training in AfL	Strong	Strong	Strong
Initial training in TLCs	None	Moderate	Strong
Initial training in AfL/TLCs provided for school leaders	None	Weak	Strong
AfL modules available and used?	Not available in Year 1, led by experts in Year 2	Moderate use, led by teachers	Strong use, led by teachers
Ongoing support for TLC leaders/ school leaders	None	None	Developing

Note. AfL = assessment for learning; TLC = teacher learning community.

Gateway

Lyon, Wylie, and Goe (2006) described the Gateway implementation in detail. Here, we focus on high-level implementation traits. Gateway district is a small suburban district and relatively forward thinking with regard to teacher professional development. The district

leadership initiated the relationship with our development team after reading about the British assessment for learning work, upon which *Keeping Learning on Track* is based.

Of all the implementations, the Gateway district received the highest level of expert assistance in assessment for learning during both the initial and ongoing learning phases. Dylan Wiliam, an internationally recognized expert in assessment for learning, provided multiple workshops and after-school seminars on assessment for learning to Gateway teachers over the course of 2 years, in exchange for ready access to teacher feedback, largely through journal entries they were required to make as a condition of the arrangement.

In the first year, some informal teacher learning activities occurred within the time set aside for grade-level teams, with tacit support from the administration for talking about assessment for learning. However, during this first year, no time was explicitly set aside for teacher learning communities devoted to assessment for learning, and no modules were available to help guide such meetings. This gap left participants to figure out for themselves how best to support one another. To some extent, they based their processes on the book, *Assessment for Learning: Putting it into Practice* (Paul Black et al., 2003), which documented the British assessment for learning work upon which *Keeping Learning on Track* is based. But for the most part, the closest they came to a true teacher learning community experience was in their monthly seminars with Dylan, when he led teachers through cycles of reporting on their assessment for learning efforts and gave supportive feedback. In effect, he became a de facto leader of a larger-than-normal, district-wide teacher learning community.

In the second year of the program in Gateway, a large number of second generation teachers joined because they had heard good things about assessment for learning from their first generation colleagues. These teachers attended a second series of workshops and seminars conducted by Dylan, and a few formed a teacher learning community under the leadership of a particularly dedicated first generation teacher. However, this group found it extremely difficult to find a common meeting time, so they have only been able to meet two times over the course of the current school year. Except for the teachers in this one group, the second generation teachers were supported entirely by Dylan in the monthly after-school sessions. The second year of the program in Gateway coincided with the development of the first modules, and some of these were pilot tested by Dylan in his monthly after-school seminars in Gateway.

In summary, the Gateway implementation relied heavily on an outside expert for both the initial exposure and the ongoing learning opportunities, and little formal capacity building was pointed at the development of local expertise through teacher learning communities.

In terms of the impact of the intervention, many teachers have become assessment for learning devotees, documenting in their journals sincere and sustained efforts at incorporating a wide array of strategies and techniques that seem appropriate for their teaching situations. Classroom observations suggest that about half of those teachers in the highest exposure group—the teachers in the one formal teacher learning community—are actually becoming quite proficient at assessment for learning. However, not all are on track—some talk a good game regarding assessment for learning, but they have not yet succeeded at putting it into practice. Nevertheless, a clear district-wide bent toward assessment for learning appears to have staying power. This development may be attributable to the high touch, high fidelity immersion that the district got, learning about assessment for learning straight from the horse's mouth. If district support for assessment for learning continues as we expect it will, we have reason to hope that more teachers will improve their practice as this year's work unfolds.

Despite the moderately promising results in the Gateway district, one obvious limitation to this delivery model is apparent: Because of the dependence on expert leadership at almost every turn, the model is in no way scalable.

The Consortium

The Consortium's implementation represents one of our more ambitious efforts at scaling up, in which we consciously attempted to establish teacher learning communities in 18 small to mid-sized districts in New Jersey. The 18 districts were members of a preexisting Consortium with a stated interest in performance assessment. Seeing some overlaps between the theory and methods of performance assessment and assessment for learning, the convenor of the network invited Dylan to conduct a 5-day summer workshop on assessment for learning. Seeing this as an opportunity to develop and test out our support systems for teacher learning communities, Dylan pushed back on the Consortium, requesting that the districts commit to sustained professional development in the form of teacher learning communities, and that the 5 days be split between a 3-day training in assessment for learning for teachers and a 2-day training for leaders of teacher learning communities and their principals. The first day of the learning community training would take place on Day One of the 5-day run; the second day would follow at the end of the

assessment for learning workshop. We expected roughly 30 leaders to show up for Day One, roughly three per district, including principals or their surrogates.

The Consortium opportunity was the spur we needed to develop and provide initial exposure and motivation in both assessment for learning and teacher learning communities. However, upon arriving for the first day of training with the leaders, we were disappointed to learn that communications about the requirements for district participation had gotten quite garbled and diluted. Teachers and school leaders who we thought had volunteered to lead ongoing teacher learning communities had no idea that their obligations extended beyond the summer workshop. Only a few districts were represented by central office staff empowered to make changes in the district's professional development plans for the upcoming school year. The leaders who were present were as surprised as we were about the miscommunication. Once we all got over the shock, we made several adaptations to the first day of training, spending considerably more time on the motivation for teacher learning communities than we had originally planned—since we had to convince them it was worth extending themselves past their original commitments.

Despite the rocky start for the teacher learning community portion of the training, the transmission of explicit knowledge concerning assessment for learning went very well. Over 100 teachers and school leaders remained attentive, responsive, and engaged over 3 long workshop days. On the last day of the assessment for learning workshop, teachers completed their first personal action plans. Most were ambitious yet reasonably well focused on plausible first steps in assessment for learning. Evaluations for the session echoed those we had received at earlier workshops: Almost all were wildly positive about assessment for learning and the activities of the workshop.

The work with the leaders of teacher learning communities was not so seamless. Despite the confusion about their ongoing obligations, most of the leaders agreed to continue into their second day of leader training and then return to their districts to arrange whatever they could personally support for the coming year. A few taught at schools with preexisting professional learning communities, which they hoped to convince to focus on assessment for learning. Most, however, knew they would have to expend a fair amount of time, energy, and personal capital convincing colleagues and administrators that this endeavor was worthwhile and deserved their involvement and support.

We had developed early versions of the first two modules, which we supplied to the leaders, and these were appreciated by the leaders. But their greatest concerns centered on how they were going to muster the permissions, resources, and time for regular 2-hour meetings with colleagues and how they were going to convince their colleagues to participate, especially since few districts were setting aside time within the school day or offering to pay stipends for after-school participation.

On the fly, we adapted many of the planned workshop segments for teacher learning community leaders into structured brainstorming sessions, employing force field and strengths-weaknesses-opportunities-threats (SWOT) analysis techniques to help them focus on the likely internal and external constraints and affordances for instituting viable learning communities and to leverage the good ideas to be found within a group of dedicated educators. We quoted a Chinese proverb, Three heads make a genius, and explained that they were getting a chance to experience the kind of group support we hoped they would foster in their teacher learning communities. The leaders told us that this was useful to them, but they were still very worried about being expected to take charge of such a radical reshaping of professional development in their schools.

We knew at the end of the training that the chances of many of these districts establishing ongoing teacher learning communities were slim. We wished we had a ready mechanism for ongoing support for these districts. Unfortunately, we were stymied by three limitations. First, the districts in the Consortium were only loosely coupled, and the Consortium did not have a strong, centralized communications network. This meant that any ongoing work would largely have to be facilitated between our research group and each individual district. Second, we had only the beginnings of a plan for how to support ongoing learning focused on teacher learning communities—it seemed we were learning about this right along with the districts. Our rather simplistic plan going into the summer workshop was to provide them with modules throughout the year and perhaps hold a midyear miniconference for leaders of teacher learning communities. Third, we were already scheduled to take on our next scalability challenge: working in a large, urban district, located hundreds of miles away. We simply didn't have the time to devote to salvage work in the Consortium districts.

We cannot gauge the effectiveness of the professional development we provided to the Consortium in terms of its impact on actual teaching practices because we have not had the

resources to interview or observe teachers. In recent months, however, we have invested resources in following up with at least one teacher learning community leader for each district. We are phoning, emailing, and conducting in-person interviews to ascertain the presence and viability of learning communities in each district. For those that never took shape or died on the vine, we are trying to find out the specific barriers they encountered.

Of the 18 districts that sent representatives to the summer workshops, two dropped out by October, stating that they "didn't know it was a year-long process." Four of the remaining 16 districts have responded to our first round of inquiries. Not surprisingly, these four are districts in which some form of teacher learning community has gotten off the ground; they have a story they want to tell. Three of these seem to be making use of the modules we send them. The fourth is a district where teachers are operating with no contract and after-school professional development is out of the question. However, they are attempting to discuss assessment for learning strategies and techniques in their regularly scheduled faculty meetings and hope to formalize the work once a contract is signed. We do not yet know what has happened in the 12 districts where we cannot get a response to our repeated calls and emails. We suspect that the news is not good in these locales; otherwise we think they would be eager to tell us their story and ask for more resources, which is what the four responders have done.

We would have to say that the Consortium delivery model was underconceptualized and weakly executed on both our end and the district's end. Given the likely outcome for the teachers in the 12 districts we cannot reach and the entire lack of ongoing support in the two that dropped out at the start of the school year, it is highly unlikely that teacher practice has changed in significant ways for most teachers who were exposed to the intervention. Thus, we would have to classify this effort as largely ineffective and prescalable.

However, the effort was not a waste: We learned that we needed to provide ongoing support for teacher learning communities and we gained a real-world bad example we can point to regarding the need for substantial up-front buy-in on the part of the district or school. We took these lessons to our next implementation, in Corolla.

Corolla

Corolla is a large, midwest school district with a declining tax base, more than 100 schools (many in a poor state of repair), a student population that comes largely from working class or poor households, and a long-standing record of weak academic performance. Under

strong leadership in the late nineties and the early part of the current decade, the district made some turnarounds in attendance, graduation, and other indicators of performance, to some extent renewing hope for some staff, parents, and students. However, recent funding cutbacks at the state level and the defeat of a local bond issue led to sizable and demoralizing staffing cuts, increases in class size, building closures, and the eventual resignation of the CEO who had overseen many of these improvements.

This challenged district provides the backdrop to our most ambitious scaling effort to date: bringing teacher learning communities focused on assessment for learning to life in 10 Title I schools, each school in its third or fourth year of failing to make Adequate Yearly Progress, as defined by the No Child Left Behind Act. To add to the scaling challenge, the district is hundreds of miles from ETS, which meant that we would not be able to provide any form of regular hand holding. Instead, after the initial exposure phase, we would have to develop capacity at the district level to support the teacher learning communities and help them keep a strong, clear focus on assessment for learning.

We were encouraged that we would be able to accomplish this goal because our relationship with Corolla originated in a connection with a very capable, highly placed central office administrator who understood the principles of assessment for learning and its potential. She was prepared to prioritize this work in every way she could. Without such an informed, committed advocate, we would not have taken on this challenge—having learned the previous summer just how critical such internal buy-in is.

Before heading off to conduct the initial rounds of training for teachers, learning community leaders, school leaders, and district leaders, we redeveloped and augmented the initial training sessions, making changes based on the gaps we identified in the Consortium summer workshops. We also worked much more closely with the district leadership in Corolla, to ensure that the teachers and their schools had a clear understanding of the expectations surrounding ongoing participation and support throughout the year. These expectations were spelled out in detail in a seven-page memorandum of understanding, signed by the CEO of the district and ETS, which captured the roles and responsibilities of both parties. The level of support the initiative sees from the district is substantial, and we believe that the process of hammering out this written document is an important reason why. One of the requirements of the memorandum of understanding was that the district must share student achievement data for this

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year and last, for the students of teachers in the program, and for teachers in a matched sample of classes. This data will allow us to test whether the intensity of a teacher's exposure to the intervention correlates with his or her students' average learning gains.

Our professional development effort in Corolla began with a 1-day workshop designed for central office-based administrators who were charged with supporting the initiative in the 10 schools. The workshop was intended to motivate these leaders by presenting the research on both assessment for learning and the research on growing teacher expertise through sustained, school-embedded teacher learning communities. Unfortunately, the workshop was inadvertently scheduled on a day when principals were told to be at their schools for a last-minute district-wide head-count. Only the central office-based staff (about 15 people) participated. However, the workshop was well received, and most of these same staff decided to attend the next two workshops, so that they could soak up all they could about assessment for learning and teacher learning communities.

The scheduling conflict we experienced on our first day in Corolla is not uncommon in that district or in other large urban districts that are battling histories of low performance. Such districts are complex organizations that teeter under the weight of conflicting programs and priorities, all brought in for the noble purpose of improving achievement or at least minimizing system failures. Throughout our year in the district, we have watched as our internal champion struggled to push the initiative back to the top of the priority lists of high, middle, and lower level leaders. She often succeeds, and because of her constant advocacy, teacher learning communities are up and running in all 10 schools and the strategies and techniques of assessment for learning can be seen in many classrooms in these schools. On the other hand, a number of disappointments have also occurred along the way, in particular in getting building principals on board in any significant way. In one school among the ten the principal is deeply involved; in the rest, it is unclear what the principal knows about the initiative; and in some schools, it is not uncommon for the principal to schedule other activities that directly conflict with the learning community meetings.

Following the workshop for district and school building leaders, we conducted a 2-day initial workshop for teacher learning community leaders, with the first day focusing on assessment for learning, and the second day focusing on their roles as leaders of learning communities. Each of the 10 schools sent two to seven teachers to this workshop (though they

were all told to send seven by the CEO). This group of roughly 40 teacher-leaders has continued to meet once a month, usually under the leadership of the internal district champion and twice under our leadership. The group has made good strides in terms of the individual members' understanding of assessment for learning and in terms of its grasp of the nuts and bolts of leading sustained school-based learning communities for teachers. The monthly meetings follow the protocols described earlier, attending to both the teacher and leader roles.

Following the workshop for teacher learning community leaders, we provided a series of three 1-day workshops for teachers in the 10 schools. Every teacher in the 10 schools was invited to attend one of these workshops. We were prepared for a total of 200 to 300 teachers to attend one or another workshop, but a lack of substitute teachers made it difficult for many to attend. The funds for substitutes had been obtained and made available to the 10 schools for this purpose; there simply were not enough substitutes available. This meant that many teachers were forced to ask their colleagues to cover their classes for them or to skip coming altogether. Clear, written descriptions of the purpose and focus of the workshops were provided to each school's principal, but these were not always relayed to the teachers, so this too cut into attendance. Nevertheless, we eventually attracted about 120 teachers to a workshop.

Once there, the teachers responded very positively, similar to teachers in earlier workshops. They were, however, skeptical of the ongoing support that was promised and immediately worried that this was just the latest reform du jour, to be replaced by the next education fad taken up by the district. We worked with district staff to assure them otherwise, but truthfully, we did not know what support would materialize as the months went by.

As it turns out, the support at the district and school level has been reasonably good. At the district level, day-to-day support comes mostly from staff who report directly to our champion, whereas staff who report to others seem to have let the initiative slide from their priority lists. The district CEO has made her support known by making a brief address at one of the workshops and by sponsoring a day-long seminar on the initiative for all principals and building-level union representatives in the district. Funds have been found to pay a stipend to teachers who stay after school to participate in teacher learning communities, and funds are available for substitutes so that teachers can visit each other's classrooms—however, such visits are hampered by a severe shortage of substitutes. Funding has been set aside to deepen and

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spread the work in the coming school year, a sign that this effort might be more than just the latest fad.

At the school level, teacher learning communities have met with varying degrees of regularity in all 10 schools. Some have as many as 18 members (far more than we advised, but they did not want to break into smaller groups, this being their "only chance to get to know one another!" as one of them put it) and some have as few as three—all three being teachers who were originally trained as teacher learning community leaders. In some schools, recruitment has extended beyond the pool of teachers who attended the initial workshop. This extension means that some teachers who have never been exposed to an ETS trainer are participating in a learning community—at this point, this is the furthest remove at which we have operated in our quest for scalability. As of March, most learning communities have worked through three or four modules, which is a reasonable number, since the training finished in October, the first meetings were held in November, and some meetings were canceled due to testing and holiday conflicts.

We have trained and placed local researchers in most learning community meetings held since January and have found that the leaders are diligently and faithfully trying to cover the material. Since we have discovered this tendency to emphasize coverage over understanding and community building, we have used our two sessions with the leaders to emphasize the latter. We have begun to see more attention to the sharing of their experiences with assessment for learning and some fledgling attempts at teachers holding each other accountable for changing and improving their practice with regard to the big idea of assessment for learning. This accountability often shows itself in the form of a prompt we have given the leaders: What's formative about that? We encourage them to follow up with this question or a related one to any incomplete or vague description of practices billed as being about assessment for learning. We find that supporting teachers to hold each other accountable is one of the trickiest issues we face—a culture of polite, serial listening prevails, with many teachers believing that it is not their place to challenge their colleagues. The isolation of years of teaching behind closed doors has not prepared teachers to share their struggles, ask for help, or provide critical analysis.

We have also begun to observe teachers in their classrooms to assess the frequency and skill with which they are trying out assessment for learning techniques. As in the Gateway district, we find that some teachers have been able to usefully integrate assessment for learning techniques into their practice, drawing out information about student learning which they then

use to modify their instruction. We have noted that in many classrooms, the selected techniques cluster around those who require physical tools, such as the Popsicle sticks used to randomly select a single student to answer questions, and the ABCD cards and white boards of whole-class response systems. Nothing is wrong with any of these choices in themselves, but the frequency with which teachers select these for the focus of their efforts suggests that the teachers' understanding of the breadth of assessment for learning is still at the concrete stage where manipulatives help to make the technique real. The next step will be for these teachers to show that they can make flexible use of the information these techniques evoke, which might lead them to some of the less obvious techniques associated with learning intentions, feedback, and activating students and peers as instructional resources for one another.

In terms of impact on teacher practices, then, we are seeing real efforts at change on the part of most teachers we observe, and some of these teachers are reaching proficiency with some techniques. A few seem to really grasp the big idea. Overall, we would say that the impact on teaching practices is moderate. In terms of scalability, the Corolla implementation has succeeded in reaching more teachers in more schools than any other delivery model we have tried. Also, the potential exists for increasing the scale of the Corolla implementation model, as other schools in the district are thinking about joining the initiative without direct support from us, and additional teachers within the starter schools are joining the existing learning communities.

Discussion

At the outset of this paper, we outlined the goal of building models of professional development that are both effective and scalable. We explained how we arrived at the notion of school-based teacher learning communities as a vehicle for accomplishing this goal, developing a theoretical and empirically-based argument for making this approach a central component in our general model of professional development. We then described the process by which we realized that the content of assessment for learning was not the only content that we needed to convey explicitly to teachers and school leaders. This process was necessary because the establishment and maintenance of teacher learning communities runs contrary to multiple prevailing conditions in schools, especially with regard to providing time and structures within the school day for supporting teachers as learners. Finally, we described how we learned from practical experience and the application of general learning theory that we had to attend to two distinct phases of

professional development: a) initial exposure and motivation and b) ongoing learning—and that we needed to attend to both of these phases for each of our featured content areas.

To aid in conceptualizing this body of thought, we offer Figure 1, which places the two content areas in relation to the two learning phases described above. Crossing these two dimensions yields a two-by-two matrix. In theory, an effective and scalable program of professional development would require attention to each quadrant in the matrix.

		Content Areas	
		Assessment for Learning	Teacher Learning Communities
Learning Phases	Initial Exposure and Motivation	Quadrant A	Quadrant C
	Ongoing Learning, Practice, Reflection, and Adjustment	Quadrant B	Quadrant D

Figure 1. Keeping Learning on Track: **Content areas and learning phases.**

At our earliest and lowest levels of implementation, we focused exclusively on initial exposure and motivation with regard to assessment for learning (Quadrant A), not unlike most currently available professional development. As our understanding evolved through praxis and research, we began to address teachers' ongoing need for support through the vehicle of teacher learning communities (Quadrant B). As our early implementations failed to demonstrate both effectiveness and scalability, we realized the need to provide explicit training to learning community leaders and school leaders to help them get their learning communities off the ground (Quadrant C). Finally, we came to see the need for ongoing support for learning by doing in the implementation of learning communities (Quadrant D).

Our research and development process and the terms of the arrangements made with our district research partners led us to direct different amounts of attention to the four quadrants

named above in Figure 1. These differences are summarized in Figure 2, in which each implementation is listed in those quadrants for which there was deliberate, structured attention.

		Content Areas	
		Assessment for Learning	Teacher Learning Communities
Learning Phases	Initial Exposure and Motivation	Gateway Consortium Corolla	Consortium Corolla
	Ongoing Learning, Practice, Reflection, and Adjustment	Gateway-Corolla	Corolla

Figure 2. **The delivery models' relative emphasis on learning phases and content areas.**

In only one of the three implementations did we deliberately and systematically provide support for both learning phases in both content areas: Corolla. In Corolla we collected more systematic data regarding the implementation, and teachers in Corolla are responding to the intervention by making changes consistent with assessment for learning in their teaching practices (Wylie, Lyon, Ellsworth, & Martinez, 2007). These results are particularly noteworthy in light of the challenging working conditions in Corolla.

We are encouraged by these results, but we are still not as far along with regard to scalability as we need to be, if we want to build a professional development model that can reach all the schools in the country that need it. The trend line across our development path is definitely heading toward increased scalability. In Gateway, we had moderate to strong take-up of assessment for learning among the participating teachers, but this was to be expected, given the high-powered, expert resources that were brought to bear—one of the leading lights on assessment for learning introduced teachers to assessment for learning and personally guided them through more than a year's worth of learning. In the Consortium, we attempted to move to scale, but didn't adequately conceptualize our own role or the role of the districts in bringing this

about. Thus, our carefully designed professional development in both assessment for learning and teacher learning communities was largely wasted. Finally, in Corolla, we were able to put the pieces together to move the intervention to scale, and we were able to reach more than 120 teachers in 10 schools with moderate impact on teachers' practices.

Conclusion

The perennial issue as we scale up further, of course, will be fidelity to the high quality professional development we can offer when we are able to send in the experts. How can we progressively tweak the content and the learning modes so that a reasonable level of impact on teacher practices can be maintained while reaching even more teachers in more schools? Our experience suggests that increasing scalability is possible, but it can't be done overnight. Rather, an iterative research and development process will be needed, one that provides opportunities to make adjustments and then test them out, and allows us time to develop and add new resources for a widening base of stakeholders.

None of the ideas in the framework we present in this paper seem especially revolutionary; the thinking reflects the application of basic learning theory, similar to the ideas laid out in *How People Learn*, by (Bransford, Brown, & Cocking, 1999). As we write, it strikes us that our application of general learning theory to teacher learning (about assessment for learning) and institutional learning (about sustaining teacher learning in learning communities) should not have taken so long or required us to learn so many lessons the hard way. We suspect, even though we had read Bransford et al., Nonaka and Takeuchi (1995), and other learning theorists, that applying these lessons to the development of effective and scalable teacher professional development is itself a knowledge creation and transfer task that can only be solved through learning by doing.

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Notes

[1] This paper was written when Marnie Thompson was on staff at ETS.

[2] Some educators use the term *content* to refer exclusively to the notion of subject-matter—what is being learned in the classroom (as opposed to how it is taught—pedagogy), usually understood as math, language arts, science, social studies, arts, etc. In the professional development world, however, the term *content* refers to what is being learned by teachers undergoing professional development, which may include general pedagogy, subject-specific pedagogy, or straight subject matter knowledge. The content of professional development at the center of this paper is focused on general pedagogy and subject-specific pedagogy, not traditional subject matter knowledge.