Teacher Professional Development Focused on Formative Assessment: Changing Teachers, Changing Schools

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March 2009

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Abstract

This paper outlines an approach to improving learning and teaching that combines two strong research bases: The research on formative assessment or assessment *for* learning provides information about what to change; research on teacher learning communities guides decisions about how to change. In this paper we describe the content and process for one model of teacher professional development. Two case studies for two school districts engaged in this process of teacher change are then presented along with descriptions of the observed effects on both the participating teachers and their larger school contexts.

Key words: Formative assessment, teacher learning communities, qualitative analysis

Acknowledgments

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Introduction

Results from international studies of educational achievement, such as the Third International Math and Science Study, have shown that students within the United States score consistently lower on mathematics and science than students in many other developed nations (Mullis, Martin, Gonzalez, & Chrostowski, 2004). The No Child Left Behind Act has attempted to address these deficiencies by holding teachers and schools accountable for ensuring the achievement and learning of all students. Although the premise behind the act is promising, its lack of concrete guidance for enacting changes will make a difference. Other indicators of education quality such as a national graduation rate of 70% (Barton, 2005), with lower rates for African American and Hispanic students, also suggest that room exists for improvement within the educational system.

Across the United States various reform efforts have taken hold. From small high schools to curriculum reform to charter schools, it is clear that many efforts are afoot to improve education. However, a significant and growing body of research points to teacher quality as the most significant influence on student achievement (e.g., Darling-Hammond, 1999; Hamre & Pianta, 2005; Hanushek, 2004; Kain, O'Brien, & Rivken, 2005; Wright, Horn, & Sanders, 1997.) This research suggests that in order to improve education for all students, the challenge becomes improving the pedagogy of all teachers. This paper outlines one approach to improving learning and teaching by discussing classroom-based formative assessment as what to change and teacher learning communities (TLCs) as how to change; and by detailing the observed effects of this approach on both the participating teachers and their larger school contexts.

The next two sections will discuss the content and process for one model of teacher professional development. Two case studies for two school districts engaged in this process of teacher change will then be presented.

What to Change: Formative Assessment

The use of minute-to-minute and day-to-day formative assessment has been shown to have a significant impact on student learning (see Black & Wiliam, 1998; Brookhart, 2005). Formative assessment (often also referred to as assessment for learning), as outlined in Leahy, Lyon, Thompson, and Wiliam (2005) is a combination of the following five key strategies:

- Clarifying and sharing learning intentions and criteria for success

- Engineering effective classroom discussions, questions, and learning tasks

- Providing feedback that moves learners forward

- Activating students as the owners of their own learning

- Activating students as instructional resources for one another

These five key strategies are held together by one overarching principle of using evidence of learning to adjust instruction in real time to better meet students' immediate learning needs. These five key strategies and the overarching principle are important for all classrooms, however, how an individual teacher chooses to implement these ideas will vary according to his or her classroom, teaching style, and/or students. For this reason, a variety of techniques for each strategy have been developed.

One popular technique is the use of soft white boards. These white boards consist of a plastic sleeve with a white paper insert, a marker, and an eraser. To use them formatively, the class is asked a question that can be responded to in a couple of words, with numbers or a diagram, every student is required to write down a response and then hold it up so that the teacher can see responses from all students simultaneously. The teacher can then use the student responses to make instructional decisions in real time: The next question that the teacher asks is driven by her understanding of how all students responded to the previous question, rather than the more limited information that she would have had had she selected just one student to answer.

At the current time, more than 80 techniques have been cataloged, therefore an in-depth description of each cannot be provided within this paper. As necessary, select techniques will be defined within the relevant case studies below. (See Ciofalo & Leahy, 2006, and Leahy et al., 2005, for an elaboration of the strategies and other techniques to which the teachers were exposed.) Each technique, like the soft white boards, requires a relatively small change to teacher practice but may result in large changes in teacher pedagogy, the classroom culture, and student learning.

How to Change: Teacher Learning Communities (TLCs)

While clear evidence shows that formative assessment can contribute to changes in teachers, how to scale these changes so that they affect not only individual teachers and

classrooms but also entire schools and districts is less clear. As discussed in Thompson and Goe (2008), several models for implementation and delivery have been piloted during the past two years. One main component of each of these models was the establishment of TLCs.

The decision to incorporate the use of TLCs into an ongoing professional development model for formative assessment was based on what is currently recognized as best practice for teacher professional development. Increasing agreement points to the premise that effective professional development needs to attend to both *process* and *content* elements (Reeves, McCall, & MacGilchrist, 2001; Wilson & Berne, 1999). The previous section outlined the content used in our professional development, that is, formative assessment.

In terms of supporting the process of teacher change, studies find that teacher professional development is more effective when it is local, sustained, and involves collective participation. Research indicates that professional development is more effective when it is situated where teachers operate so that it can be sensitive to local constraints (Cobb, McClain, Lamberg, & Dean, 2003). A sustained effort of professional development is also more effective than one-day workshops (Cohen & Hill, 2000; Ingvarson, Meiers, & Beavis, 2005). Research evidence supports the importance of professional development involving teachers in active, collective participation (Garet, Birman, Porter, Desimone, & Herman, 1999). The TLCs attend to each of these considerations by forming a school-based, ongoing workshop where active, collective participation is a requirement for participation.

In addition to these process elements, professional development is more effective when it focuses on deepening teachers' knowledge of the content they are to teach, the possible responses of students, and strategies that can be utilized to build on these (Supovitz, 2001). A formative assessment focus within established TLCs can provide a way for teachers to learn to think systematically about student thinking and to tailor their instruction to meet the immediate learning needs of students.

While introducing new material to teachers may be of intellectual interest to them, it is of little long-term value unless it becomes embedded as a habit of mind and part of their regular practice. The challenge of all professional development efforts is to help teachers to transfer new knowledge into practice. Research on the nature and development of expertise (Berliner, 1994) provided some insight: Expert teachers develop *automaticity* for the repetitive operations that are needed to accomplish their goals, they are more opportunistic and flexible in their teaching than

novices, and they perceive meaningful patterns in the domain in which they are experienced (Newell & Simon, 1973). The book *How People Learn* (Bransford, Brown, & Cocking, 1999) identified situations that support learning, such as an opportunity to reflect on experiences in systematic ways so that they can create and build an accessible knowledge base and learn from their own mistakes.

Etienne Wenger's research (1998) focused on the development of communities of practice that establish themselves, formally or informally, among groups of people who work in similar areas. By interacting with people who are expert in an area, a group member can see ways in which he or she could also develop that same expertise. While the observer's future is not determined in terms of his or her ultimate level of expertise, however, a paradigmatic trajectory does exist. While the TLC model does not necessarily have an identified expert in formative assessment, each teacher brings different experiences and expertise to the group and some individuals may develop local expertise in a particular technique, which then serves as a model for other group members.

Therefore the format of each delivery model for formative assessment was built upon the work cited above by attempting to establish and maintain school- or district-based TLCs. In brief, participating teachers were given a 1- to 3-day introduction to formative assessment and TLC meetings were then scheduled throughout the school year on a monthly or bimonthly basis. Some TLCs were heterogeneous and were comprised of participants from a range of grade levels and subject areas. This make-up allowed for diverse discussions across topics. Other groups were homogeneously comprised according to grade level or subject, allowing for a support network comprised of teachers with similar situations and students. Through a regular sharing of how they were trying out and refining formative assessment techniques, as well as the presentation of new techniques, we sought to help participating groups and teachers habitualize these practices. In addition, as participants shared their own experiences and worked collaboratively to problem-solve, we hoped to see communities of practice develop.

Framing the Two Case Studies

The research compilation *How People Learn* (Bransford et al., 1999) ends with a challenge to those who work in the area of teacher professional development to conduct research that identifies "the processes and mechanisms that contribute to the development of teachers' learning communities" (p. 240).

This paper seeks to contribute to that knowledge base by providing case studies that illustrate the experiences of the teachers within two districts—Gateway and Spruce. (The names of the schools and all the teachers within the schools have been changed to pseudonyms.) The teachers in each district were exposed to formative assessment through different delivery models, but all participated in some form of a TLC. The analysis seeks to understand these two groups, their exposure to and implementation of formative assessment, the important process and mechanisms that emerged, and the changes that were observed over the course of the year. These case studies aim to show not only the changes that can be enacted by individual teachers, but also how the TLCs' wider context was either impacted positively by the TLC or had a stifling impact on the TLC.

Gateway School District

This case study describes the Gateway School District and begins by introducing a participating group of teachers and the specific context for their exposure to formative assessment. We follow with an in-depth look at one participating teacher—Gail—and her impact on the wider school context.

Context for the Gateway Teacher Learning Community (TLC)

The Gateway TLC was formed when teachers across four small, moderately affluent, mostly White, suburban districts in a northeastern state were asked by a joint curriculum coordinator to volunteer for a new professional development experience. Three districts (including Gateway) were K–8, and one was a high school district. (In Gateway's state, clusters of K–8 districts feed into a district with a single high school. Often the districts share curriculum coordinators across the cluster.) We chose to focus on the Gateway School District and Gail for several reasons. First, Gail was one of three teachers from three different grade levels within the Gateway K–8 school, and they formed a distinct cluster within the larger group. The variety in grade levels within this school was viewed as a positive in that it allowed for diversification of the information within the school and across grade levels. Second, the teachers in this school appeared to have a supportive administration that encouraged professional growth among the teachers and created opportunities for them to share what they were learning with colleagues. Third, the teachers had a strong tradition in the school of collegiality and teamwork, with regular opportunities for grade-level planning time. Finally, the three teachers in this school found that

the formative assessment strategies and techniques fit particularly well with other curricular efforts within the district. Thus, the teachers felt that the techniques and strategies complemented the existing structures and constraints that were already in place. This arrangement was important because the teachers felt that they were adding to their repertoire rather than trying to implement something completely new or unrelated.

Exposure to Formative Assessment

Teachers from across the four districts were invited to attend six, seven, or eight half-day meetings throughout the course of the 2004–2005 school year. During these workshops, participants would learn about formative assessment, plan for its implementation within their classrooms, and reflect on its impact. Eight teachers volunteered. These teachers received no monetary compensation for participation but were given release time and coverage for their classes in order to attend TLC meetings during the school day.

During the first half-day session, the teachers were introduced to formative assessment, including the five key strategies and one big idea, the research supporting this framework, and a variety of the practical techniques that could be used to address each strategy in their classrooms.

At the end of the first session, participating teachers were encouraged to select one or two strategies to try with one class (if they were secondary teachers) or in one subject (if they were elementary teachers). The teachers were then asked to write individual action plans, outlining the specific techniques within each strategy that they would like to implement in their classrooms. This activity followed the processes set out by Black, Harrison, Lee, Marshall, and Wiliam (2003). In their action plans, teachers wrote about the strategies they would address, the techniques they would employ, and the current practices they would relinquish in order to make time for the new techniques. In addition to their action plans, participants received instructions for completing reflective journal entries describing their experiences in using the strategies and techniques they selected.

This group of teachers continued meeting throughout the 2004–2005 school year. Each subsequent session was facilitated by an ETS expert in formative assessment and focused on techniques that had been tried, techniques that were successful, and new techniques that would enhance the implementation of formative assessment.

Data Sources

The teachers began their meetings at the beginning of the 2004–2005 school year and were required to complete the following at each meeting:

1. An individual action plan detailing the techniques and strategies they would implement during the time between meetings

2. A reflective journal entry that described what they had implemented in their classrooms and the results they had observed

The ETS facilitator recognized that the feedback from these two data sources had the potential to inform further development, implementation, and dissemination of formative assessment. As a result, TLC observations, classroom observations, and teacher interviews were conducted. The remaining meetings were then attended by the ETS facilitator and another ETS researcher (one of the authors of this report). She observed the remaining meetings, took notes, and collected documents from the teachers. Seven of the eight participating teachers were interviewed, and most were observed in the classroom. For the classroom observations, the researcher took detailed notes focusing on how the teacher incorporated formative assessment practices into instruction.

These data were then reviewed and compiled into a single narrative describing the development, implementation, and dissemination of formative assessment within the group and across the districts. This narrative was reviewed by two team members and clarifying questions were posed. Once the questions were reconciled, any claims or generalizations were evaluated for accuracy by the facilitator (the only other staff member with first-hand knowledge of the group, its teachers, and their implementation). The final data set was used to provide information for Gail's story.

Gail's Story

Within the Gateway School District, Gail stood out from the other teachers in several ways. Gail was a leader not only at her grade level, but also within the entire K–8 district. She was also working on a degree in educational administration and decided to do a collaborative action research project on formative assessment. Gail found that the formative assessment

strategies and techniques worked extremely well for her and her students, and sought out opportunities to share some of these ideas with other teachers, both informally and formally.

Gail focused her efforts on several strategies including better questioning, and peer and self assessment. Specific examples of techniques used within her classroom included traffic lighting for homework checking, two stars and a wish, and wait time. When students "traffic light" an assignment, they use red, yellow, and green markers to indicate their level of comfort with problems, concepts, or topics. A red dot indicates that the student has no understanding of the concept, a yellow dot indicates that the student would like the teacher to slow down or review the problem, and a green dot means that the student understands the concept. This technique is particularly valuable as students are learning to be accountable for their own learning. By asking those students who mark a problem or concept as green to explain the main idea to another student who marked the same concept yellow and red, the teacher can quickly help students learn to be honest as they take account of their learning. (Students only mark a concept green if they feel that they understand it well enough to teach it to a peer.)

Two stars and a wish is a peer assessment technique that provides a structured way for students to give feedback to each other. When students are assessing each other's work, they are asked to provide two positive statements about the assignment and one statement that reflects something that could be improved. This technique gives students guidance about the amount and tone of acceptable peer feedback. An example for a mathematics homework assignment may be:

Star—You correctly completed the table of x and y values.

Star—You showed all your work.

Wish—I wish you had considered the use of a different type of graph.

A detailed description of wait time is provided in Ted's story within the Spruce case study.

Based on Gail's reflective journal entries, she saw substantial changes in her students and her classroom. In her second journal entry, she wrote: "I have been the most impressed with how much more involved my students have been in their own learning.... Their confidence in their efforts has been wonderful."

The interview with Gail provided further insight into her implementation of formative assessment. Gail reported that she was continually impressed by how much was achieved through seemingly small changes. She attributed much of her success to the administrative

support in her district. She felt that the administration had created an environment in which teachers could experiment with new strategies. She further explained: "We don't have to have 'cookie cutter' classrooms, where we're all on the same page. There's an atmosphere here that supports innovation. We can individualize.… We're encouraged to try new things and we're given time to share with our colleagues."

Gail strongly felt that the administration had given her and her colleagues a great deal of latitude in deciding what they wanted to do instructionally both within their classrooms and within their grade level teams. This supportive school environment was highly compatible with the ethos of formative assessment where the strategies are viewed as important to all classrooms but where individual teachers select techniques that are appropriate for their particular context. This school-level latitude was not only important to her implementation of formative assessment, but it also allowed Gail to have a greater impact on the initiative within her district.

Impact on the Wider District Culture

By the end of the 2004–2005 school year, Gail's experience had had a wide-ranging influence. In her interview, she described how most of the teachers on her third grade team were now trying formative assessment techniques, even though they had never received any formal training. Gail felt that this dissemination was a direct result of the opportunities for the third grade teachers to share with one another. Gail also served as an advocate for this initiative. She spoke about the strategies and techniques informally—in the hallways and lunchrooms—and formally—at staff meetings. These opportunities to share created motivation for other teachers to try out the new ideas. Gail reported that several other teachers were impressed with her commitment to the initiative. She commented that the other teachers could "tell I had a passion about it; I *lit up* when I talked about it!"

When the 2004–2005 year ended, a new group of teachers were invited to join the initiative. The curriculum coordinator planned a summer workshop for new participants. These participants were also volunteers and the summer workshop was unpaid. The response within Gail's district was overwhelming.

Unfortunately, Gail and the other teachers from the 2004–2005 school year were not invited to participate in the professional development (the districts only provided release time for this opportunity for one year). However, Gail decided to continue with the work by facilitating an after-school meeting for both cohorts of teachers (the 2004–2005 group and 2005–2006 group

of teachers). Due to scheduling constraints, Gail was only able to schedule two meetings—one in the fall and another in the winter.

Even with the limited nature of the meetings, they were a success. At both of the meetings, Gail used a fairly informal approach. Participants were asked to discuss the types of formative assessment techniques that were being used in the classroom. The specific information led to a general discussion focused mostly on formative assessment.

These meetings became an important support structure not only for Gail, who was continuing on her own with learning, but also for the teachers who were new to the initiative. These new teachers reported that the meetings were valuable because they provided an opportunity to learn what teachers in different grade levels and subjects were doing in their classrooms. These meetings were the only opportunities they had for discussions that cut across the curriculum and grade level structure.

In addition, the forum allowed teachers who were not involved in the 2005–2006 workshops to begin to participate. In Gail's second meeting, a teacher who was new to the school participated. This particular teacher had been hired at the beginning of the year. Thus she did not have an opportunity to sign up for the summer workshop and could not participate in the remaining formative assessment workshops. She explained, "I had heard so much about assessment for learning from other teachers within the school and district that I wanted to find out more."

The Gateway School District where Gail worked provided an ideal environment for the first-year implementation and dissemination of formative assessment ideas. The teachers were provided with release time and given latitude within the curriculum and school structure, and a collegial environment was already in place. This combination allowed Gail to have the significant impact on the wider school culture that was discussed previously. However, the district did not provide for ongoing support past year one. The initiative was viewed as a one-year project, where once a teacher completed the year, he or she was done. Gail wanted to continue with her own growth and therefore took control and formed her own learning group. Because of time and structure constraints, this group was only able to meet twice during the school year. This meeting schedule would not be sufficient to continue an initiative under most circumstances, but it did represent what could be accomplished with a strong local advocate.

While Gail's group did not create the localized, intimate support network that will be discussed in the next case study, she did manage to influence a large number of teachers within the district, garner the support she needed for her own learning, and recruit new teachers into the initiative.

After reviewing this case study, one question can be asked: Why was the formative assessment initiative of great interest to a group of teachers in this district while it struggled to have a far-reaching effect in others? While we cannot empirically answer this question, we can certainly speculate about the influence that an initiative advocate and strong district support had on the implementation. This speculation has led to the encouragement of two-year formative assessment initiatives and the need to identify not only a school-level advocate, but also an advocate at the district level.

Spruce School District

Context for the Spruce Teacher Learning Communities (TLCs)

The Spruce TLC was formed when the sixth through twelfth grade mathematics teachers from across a large urban school district in a northeastern state were invited to attend a 3-day workshop on formative assessment. The Spruce School District serves mainly a low-income, African American student population. During the summer of 2004, approximately 40 teachers expressed interest and attended the professional development opportunity. The majority of these participants were high school mathematics teachers who came from three separate high schools within the district. Three additional teachers from the middle school attended. The initial training encompassed all participating teachers, but it was clear that following this training, smaller school-based TLCs would need to be formed. One of the three high schools had too many participating teachers to form a single TLC; therefore they were asked to indicate a preferred day of the week and were assigned to one of three TLCs. Teachers were originally assigned to groups in such a way that the preference of each teacher was met while providing each group with a range of experience levels and a mixture of both men and women.

We chose to focus on one of the three high school TLCs: Spruce 3. Although the initial group included one woman, she dropped out after having attended the summer workshop, leaving six men. The six men ranged in age from early thirties to midfifties and possessed anywhere from 6 to 36 years of teaching experience. Four of the men in the group were White,

one was Hispanic, and another was Asian American. A more specific description of each member is provided along with their story below.

Exposure to Formative Assessment

Teachers were invited to attend a 3-day summer workshop on formative assessment. Participation was voluntary, and teachers were paid for their attendance. At the workshop, the teachers were introduced to the same body of research and practical techniques for formative assessment as the participants from the Gateway School District. In addition to the background information, participants were also introduced to Pathwise teacher assistance package guides (TAGs). The TAG materials provided teachers with content-rich mathematics tasks (pre-algebra and algebra), related discussion questions, and rubrics and sample student work. One of the three days at the summer workshop focused on the formative use of these materials. For example, the use of the sample student work as a way to explicate rubrics and share success criteria with students was discussed. Participating teachers also identified places within the current curriculum where the TAG materials could replace a current lesson or sequence of lessons. The teachers from the Spruce School District were also encouraged to write individual action plans following the same process as the teachers within the Gateway School District. The teachers from this district not only planned for the use of formative assessment, but were also asked to plan for the formative implementation of the TAG materials across the school year.

Participants were then divided up into smaller TLCs that met monthly throughout the year. The participants used these meetings to discuss the implementation of formative assessment in their classroom. At each TLC meeting, teachers would decide to continue trying a particular technique or to attempt something different. The initial action plans that they wrote during the summer workshop were then revisited and revised as necessary at the end of each meeting.

Data Sources

The ETS staff person assigned as note-taker for each TLC meeting (this role rotated among four researchers) wrote a running narrative, typed up notes during the following week, and shared them with the other team members. These data were later transferred to N6, a qualitative data analysis software package. The meeting narratives were coded to facilitate retrieval of specific parts of the data later in the analysis process (Merriam, 1998). In addition,

TLC participants were interviewed either one-on-one or in pairs by a member of the ETS research team during the second to last TLC of the year.

For this data set, codes were developed both *deductively* and *inductively*. Deductive codes are used when the data are analyzed using preexisting categories. Inductive codes are developed in the course of the data analysis as a new category is identified from the data, and then that code is applied to the rest of the data.

The data were initially coded for demographic information and the various techniques that the teachers discussed using in their classroom. A second round of coding was carried out against a series of research questions. For example, the researchers were interested in how the teachers' understanding of the formative assessment techniques changed or deepened over time. Specific codes were used to identify conversations where the teachers talked about either the logistics of using a technique, the impact that a technique had on student learning, or the adaptations that they made to a technique. Two ETS researchers independently coded the meeting narratives for one group, compared their codes, and resolved discrepancies in a face-to-face meeting. During the initial resolution meeting, additional inductive coding categories were added to the list. For example, both researchers noticed instances where one or more of the teachers focused on reasons why a technique would not work for them, and so a code to track resistance to change was created along with a second code to identify instances when other members of the TLC challenged such negative comments. The meeting narratives for the other four TLCs were then coded independently by the two researchers, followed by a meeting to resolve coding discrepancies.

For the analysis presented in this paper, the coded data for each teacher in the TLC was reviewed in turn, examining the formative assessment techniques that they discussed using in their classrooms, questions they asked of the group, contributions they made to the group, and reactions to the ideas and suggestions made by ETS staff. For each group member, a narrative description was distilled from all the coded references to that particular member across the meeting narratives. This description was then shared with another author of this paper along with the set of relevant codes. Disagreements were then resolved. A similar process was carried out for the TLC and the wider school context narratives.

Spruce 3's Story

The Spruce 3 TLC met monthly with all the meetings taking place in the classroom of one member of the group, Tim. The ETS research staff and facilitators provided the meeting materials and snacks. The first teachers to arrive at Tim's room pulled a few tables and chairs together to form a circle. Generally Tim was already in his classroom when ETS staff arrived (usually two people—one to facilitate the meeting and one to take notes).

Each meeting followed a consistent format: an initial opportunity for the teachers to talk about formative assessment techniques they had tried out since the previous meeting, one or two activities that focused either on one aspect of formative assessment (for example, giving students meaningful feedback, comment-only grading, using white boards, starts and ends of lessons) or on the explication of one set of TAG materials, and a wrap-up activity during which each teacher revised his action plan.

In an effort to move responsibility and ownership for the group and its processes to the teachers, for 3 months (December to February), one of the teachers facilitated the meeting. An agenda and materials for each meeting were provided ahead of time by ETS, and staff members were available to answer questions. Research staff and facilitators were still present at each of the TLC meetings to provide support and clarification. Although this approach worked quite well with this group, it was less successful with other Spruce TLCs and was not continued after February.

The following sections will provide a narrative for each member of the Spruce 3 TLC. This narrative will explain the participants' roles within the group, their implementation of formative assessment, and the collegiality that grew between members.

Teodore. Teodore holds a PhD, has 30 years of experience, mainly teaches bilingual classes in the high school, and is respected by his peers. Teodore attended the summer workshop and six of the nine TLC meetings. In addition, he volunteered to facilitate the February TLC meeting. The other teachers tended to refer to him as Doctor Teodore. He did not dominate conversation during the meetings but was actively engaged in the material.

He had a strong commitment to his students and mentioned in several meetings that he was very concerned with preparing them for the real world. However, this concern had a peculiar manifestation: He mentioned on more than one occasion that he would pressure students to answer quickly since they needed to be comfortable with high pressure testing situations.

During the beginning part of the year, he incorporated materials from two of the TAGs into his teaching although the materials were not necessarily used formatively. It was only with some gentle pressure from other members of the group and the facilitator that Teodore agreed to allow the students to use the provided rubric to grade their own work. In an interview that took place later in the year, he discussed the idea of using evidence in his classroom to think about both teaching and learning, and also about the impact that using rubrics had on his classroom:

> We all use rubrics but I'd never shared it with the students and let them know exactly what they have to do. Most of them don't understand but I took some time and explained to them, I gave them a project last semester, and explained to them how it would be graded and what they should look for. It was a research paper, and by doing that it was helpful to them and they were able to do a better job. Their papers were much better by having explained to them before what I expected and how it was going to be graded.

Teodore used a number of the formative assessment techniques such as white boards, exit tickets, and ABCD cards. When using the exit tickets technique, a teacher poses a question at the end of a class and students write their response on a 3" by 5" index card. This index card is handed in to the teacher as the students' ticket to leave the class, and the teacher can review the student answers in time to plan the next lesson. (A detailed explanation of ABCD cards is provided during Tomas's story.)

From his contributions at several meetings, Teodore was clearly using white boards as a way to gain insight into student thinking. Unfortunately, the descriptions of how he used some of the other techniques were limited and therefore it was not clear whether he was using the techniques formatively.

Although Teodore made some progress in the implementation of formative assessment based on his use of white boards and rubrics, discipline issues were also a concern that impacted how he viewed some of the ideas presented and the specific techniques or approaches he implemented. Stemming from this concern, one approach that he talked about was the use of raffle tickets to encourage on-time attendance to his classes. (Students were given raffle tickets as rewards for certain behaviors, and a ticket was drawn periodically for a prize.) Although this approach to classroom management was not related to formative assessment, it shows one instance of sharing instructional approaches that benefited both the teachers and their students,

and we hoped that with better classroom management strategies in place, Teodore could then pay additional attention to the formative assessment techniques.

In terms of the group itself, he was always included when the other teachers referenced checking in with each other, but he was not part of the group of four teachers who worked most closely together outside of the TLC meeting.

Ted. Ted holds a masters in education and was in his fourth year of teaching after leaving and returning to the profession. He attended the summer workshop and eight TLC meetings. In some respects he was quite engaged with the process. He mostly used the white boards technique, and he came to one of the early TLC meetings with the idea of replacing the white insert with a graph paper insert. The ETS facilitator had come to the meeting with these inserts already prepared, and Ted seemed pleased that his idea had been validated. In an interview that took place during part of his eighth meeting, Ted spoke about how he had started to team-teach with Tristan, a fellow TLC member. They talked together, planned the lesson, and practiced the math before they taught the lesson. They then combined their two classes and taught the lesson together. This was the only instance of team teaching or peer observation that was reported throughout the project. Ted also actively participated in the creation of a reflections sheet with Tim, another TLC member, and used some of the TAG materials with his classes.

While Ted was willing to try some of the new ideas, he also was quite traditional in his approach and admitted in an early meeting that he was not yet comfortable with group work. Even though Ted was engaged with the process and piloted several techniques, his understanding was often superficial. Ted had tried wait time, a process where the teacher waits 3 seconds after asking a question to call on a student and then waits an additional 3 seconds after the student finishes speaking before commenting on the student's response. Ted, however, described the process as "most of the time I am just staring at them because they are talking."

Ted's limited understanding was evidenced in the early part of the year by his use of Popsicle sticks. When Popsicle sticks are used formatively, each student's name is written on one Popsicle stick so that after the teacher asks the question and waits for a few seconds, he or she can randomly select a Popsicle stick in order to identify a student to respond. By asking the question first and waiting, the teacher is requiring all students to think about the question because any student may be called upon. For Ted, the primary reason for using this technique was as a way of learning students' names rather than engaging the whole class in questioning.

In his seventh meeting, Ted realized that he could use the white boards with the graph paper: He seemed to have forgotten that was how he had started out with them at the beginning of the year. However, he did talk about getting students to show their responses to the whole class on the overhead projector, noting that it allowed students to share and to get immediate feedback.

In spite of his engagement with the process and willingness to incorporate new instructional approaches into his practice, on occasion Ted distracted other members of the group by introducing tangentially related topics during discussions. At four of the seven meetings he attended, Ted sidetracked conversations at multiple junctures on the topic of mathematics curricula, specifically the Core Plus curriculum or the Connected Math program. At three separate meetings, he asked about what ETS was trying to accomplish with the project. Each time he seemed to understand and be content with the response from one of the ETS researchers, and yet he continued to ask. In his interview, he again indicated that he did not understand the point of the year but that he would like it to continue into the following year. His responses failed to reveal whether Ted truly did not understand the project or forgot previous explanations. Even though he indicated that he was not aware of the project's big picture, he offered to facilitate TLC meetings the following year.

Overall, Ted's progress was mixed. In certain respects he understood some of the techniques and ideas of formative assessment, and he certainly valued the opportunities to get together with the other mathematics teachers to exchange ideas. However, in a number of areas his understanding did not seem to progress as much as some of the other group members.

Todd. Todd has 9 years of teaching experience and had previously been in the military. He was one of the more talkative members of the group. He did not attend the summer workshop but consistently attended the first six meetings and volunteered to be the first facilitator. Todd started at a disadvantage to the others because he did not share the common language and understandings that they had developed during the initial training. During the first meeting, the facilitator asked other group members to give a synopsis of several techniques; however, the explanations did not provide enough information for a teacher to develop a strong understanding of the underlying research or to start with a strong implementation of the specific technique.

Throughout the meetings, Todd came across as reluctant to change. This reluctance was illustrated during the action planning segment of the first TLC meeting. Todd asked the

facilitator, "Tell me what to do? I don't know what to do." Several techniques were suggested, and Todd chose the one that he felt would be easiest.

Todd was probably the most traditional teacher in this group. During discussions of group work and classroom interactions, he often spoke of being a "rows and columns" type of teacher, and even clarified that description by saying "straight rows and columns." Todd's traditional classroom style combined with his absence at the initial training in formative assessment resulted in a weak implementation within his classroom.

Todd talked with pride about several classroom techniques, all of which were appropriate classroom practice but not strongly related to formative assessment. For example, once or twice a semester he would have students calculate their own grades using the class rubric as a way to help them to understand how their grades were derived. He also developed a point system that penalized students for being late to class and rewarded them for being on time. On several occasions when the discussion would move to self assessment, rubrics, or peer assessments, Todd would talk about either of these two approaches outlined above. Often this resulted in an off-topic discussion of grading, student apathy, or tardiness. No one ever challenged these techniques or pointed out that they did not focus on collecting evidence of student understanding or using evidence to adapt instruction.

Throughout the year, Todd reported using several formative assessment techniques including end-of-class student reviews, traffic lights, group work, and white boards. An end-of-class student review is when the teacher chooses one student before the lesson to give a synopsis of the lesson at the end of the period. Peers can then pose questions to the reviewer who can either answer the questions or defer to the teachers. Unfortunately, Todd did not share enough about his use of the technique and resulting information to tell if the information collected was being used to inform instruction.

Todd was usually the first member of the group to negatively comment on school culture, students, parents, and the administration. On several occasions, the group discussed the low ability level of the students. During these discussions, Todd would inevitably remark that "social promotion is the worst kind of cancer" and go on to explain that passing students who were not academically prepared would be the downfall of the nation. Although many of the teachers clearly did not agree with Todd's flamboyant statements, only the facilitator would challenge his remarks.

The highlight of Todd's participation in the group was his facilitation of the December meeting. It was apparent that Todd took his role as leader very seriously. He arrived prior to the meeting, had reviewed all of the materials, and was ready to start on time. He remained conscious of the agenda throughout the meeting, asked participants to clarify or expand on their statements, and made sure that everyone had a chance to participate and share. Overall, the meeting ran very smoothly and Todd guided several engaging conversations.

The February workshop was the last workshop attended by Todd. It was unclear if he did not attend the last three workshops due to scheduling conflicts or if he had decided to withdraw from the project. Throughout the 6 months that Todd participated, he tried a few techniques, but from his focus on existing nonformative classroom practice, it was clear that he did not understand the big picture of formative assessment.

Tristan. Tristan has the least teaching experience in the group, is trained in special education, and by his own admission, has mathematics skills that were not the strongest. Tristan attended the summer workshop and every meeting during the year, bringing a high level of enthusiasm to the group.

Tristan used all of the TAG materials that were provided to him and had reviewed them carefully to identify where they matched the curriculum. He used the rubrics with his students and, at least once, spent an entire week working through the various components of a guide. In an interview he recognized that the TAGs were valuable because they helped him, as a teacher, to better understand certain mathematics concepts. He expressed some concerns early on about spending so much time on them and wondered if the mathematics chair knew how long he was spending.

He also used the most techniques of all the teachers in his group: white boards, exit tickets, group work, learning partners, and wait time, although he, like several other teachers in the group, had an unusual understanding of wait time (more like "wait them out").

Of the whole group, Tristan had the most supportive attitude to the students: He worried about the impact of low scores on students' self esteem; he spoke of respecting students and their culture; he commented on students being starved of attention; and he reflected on the fact that nobody cared about the gang violence occurring for years in the district, but now that it was moving to more affluent districts, people were acting more concerned.

Tristan was the most likely person in the group to challenge another person's ideas without being aggressive, especially when someone made negative comments about students. In a discussion that focused on providing students with actionable feedback rather than grades, Teodore defended grades because they prepared students for the real world. Tristan challenged Teodore by commenting, "Teodore, sometimes grades kick the kids when they are down."

Later, during the same meeting, conversation was side-tracked by Todd who was complaining about the high failure rate in the school. Todd commented, "Normal school doesn't work like this." Tristan replied, "I know what you are saying, Todd, but most of these kids want to be successful. They're scared to take a risk." In both of these instances, Tristan was respectful to the other members of his group, but he also was not willing to allow negative comments about students to go unchallenged.

Tristan was willing to admit his own limitations. In a workshop activity focused on group work, the teachers were given a mathematics task to complete as a group. Ted commented that group work was "just teaching socialization" and that it took away from the mathematics. Tristan disagreed and said that as the only nonmath expert, he learned more during the activity because he worked with a group in which he felt comfortable.

Tristan recognized and valued the fact that the TLC meetings were the springboard for the more extensive collaboration that had sprung up among the group members, primarily among Tim, Tomas, Ted, and himself. He participated in some team teaching with Ted, which both men described as a beneficial experience.

Tim. Tim was the natural leader of the group and was highly respected within the school. He has 35 years of teaching experience and a masters in education. All the TLC meetings took place in his classroom.

Tim was one of the only teachers in this district to take on comment-only grading. Comment-only grading is a system of marking in which no number or letter grades are assigned, but rather substantive feedback comments are given. At the start of the year, Tim implemented a portfolio system with one of his classes. Tim marked each assignment that students handed in as complete, incomplete, or unattempted and then chose a subset of the assignments on which to write more focused comments. Once the work was marked, it was filed into the student portfolios at the front of the room. The students were told that while class time would not be spent reviewing past assignments, they could review their folders at any time.

Tim worked on the implementation of this technique throughout the year and encountered several difficulties. From the very first TLC meeting, Tim recognized that his system was problematic. Although the folders were available to students at all times, no students ever reviewed the comments. It was suggested that Tim give students the last 10 minutes of class to review the comments, but this solution never materialized. Tim talked about this same problem at the sixth meeting and was even challenged by Todd, who asked, "If you go through all of this effort and 80% don't even look at it… Why do it?" But there was no response or further discussion. Based on these exchanges, Tim clearly had not made the leap from collecting evidence to using evidence of learning to adapt instruction.

Failing to fully understand the connection between collecting evidence and acting on that evidence was also apparent in his use of exit tickets. In one of the early meetings, Tim shared a question that he used for an exit ticket. He had been working with his Algebra 2 class on fractions. He reviewed addition of fractions with the class and knew they could answer the following question:

$$\frac{1}{3} + \frac{1}{5} = ?$$

At the end of the class, Tim wanted to see if his class could generalize to the addition of fractions with unknowns, and so asked his students to respond to the following question on an exit ticket:

$$\frac{1}{X} + \frac{1}{Y} = ?$$

He found that even though all of the students in the class could successfully answer the first question, only a couple of students could successfully respond to the exit ticket. When Tim was asked what he did in the next lesson, he responded, "Used another starter [question]." The facilitator pushed Tim's thinking by asking if he ever used the results of the exit ticket and then further suggested that he have one of the students who responded with the correct answer explain the problem to the rest of the class. It was clear from the interaction that Tim had not considered connecting the subsequent lesson to what he learned from the exit ticket. When this oversight was called to his attention, he realized it would be a powerful teaching tool.

Secondly, Tim found that in order to write quality comments, he had to start with quality questions. This theme followed Tim throughout the workshops. As Tim worked to implement new techniques and strategies, he began to realize that to collect good information, give good feedback, and set up quality learning environments, he would have to develop better questions. He was able to generalize this idea beyond writing comments to setting up group work and even using rubrics.

Despite Tim's difficulties with comment-only marking, he was able to make connections between the monthly workshops. He seemed to understand that formative assessment was not a set of unrelated ideas but a theory of practice for teachers. Tim made statements that alluded to important changes he had made to his practice as a result of this experience. He stated:

> One of the things the principal is concerned with is that she sends teachers to this TPD [Teacher Professional Development] or that TPD, and they come back and teach the same way. She's really frustrated and I know what she is talking about. I attended a TPD session in London on Plenary. I had a great time and thought that I was learning a lot while I was there, but it didn't much change what I was doing here, when I got back. This work, has really changed what I do—more than most things. When you stop grading papers with numbers, that's a big deal!

All in all, Tim implemented several formative assessment techniques (e.g., exit tickets, comment-only marking, etc.). And although he did not take advantage of every opportunity, he was beginning to make important connections and was seeing a shift in his practice and the culture of his classroom.

Tomas. Tomas is one of the younger members of the group and has 9 years of teaching experience. He was the group's quietest member. Even though Tomas attended six of the nine TLC meetings, he had not attended the summer workshop and therefore he and Todd were at a similar disadvantage. Tomas rarely shared with the group unless he was directly asked a question. His contributions never took the group off-task, but in the six meetings that he attended, he rarely made more than two contributions during any meeting.

During the third meeting of the year, he talked about his implementation of the materials in two of the TAGs, specifically discussing his concern regarding the amount of time that it took given the pacing guide. Unlike Tristan, he was not prepared to spend a considerable amount of time on the materials and was trying to constrain the work to a single period.

During the course of the year, he mentioned using several techniques including white boards and the ABCD cards. The ABCD cards can be used with multiple choice questions. Every student in the class is given four cards, each with one large bold letter. When the multiple choice question is asked, every student is required to vote for an answer by holding up the appropriate lettered card. Although Tomas mentioned the use of these techniques, the detail is so scant that it is not clear how he used the materials or how well he understood the underlying research or rationales. He talked on one occasion about asking students for feedback in terms of what they wanted to learn, but he made no comment about how he used the information or about the impact that it had on either him or his students.

In the final analysis, Tomas remains somewhat of an enigma. He was naturally a quiet person, and perhaps felt less willing to share because of his inexperience. During the fourth meeting, each teacher was asked to share one technique with a colleague in the school. Even though the materials were provided by ETS, Tomas chose not to share with another colleague.

Occasionally, Tomas expressed concerns to the group that were similar to ones voiced by the others: students not coming to class on time or students in algebra classes looking at him like they had never heard the content before. The group was always supportive of him, offering sympathy although not any specific help. He did not appear to have established a support system the way that Tristan and Ted did, even though he would have benefited from some form of team teaching or other support.

The Impact of One Teacher Learning Community (TLC)

On nine occasions during the course of the school year, a group of six men met after school to talk about issues connected with formative assessment. The meetings had high attendance records for each of the members, and on occasion the group was joined by a member from another group within the school. Similarly, at least one member of this group joined with another group when he was unable to attend his scheduled meeting. Tristan had attended all nine meetings; Tim, eight of the nine. All six members were present three months; five of the six were present three months; and four or fewer were in attendance three months.

The members of this group formed a community that extended beyond the formal TLC meetings. Tim, Tomas, Tristan, and Ted all referred to talking together about mathematics issues outside of the regularly scheduled meetings in a manner that was different from what they had done the previous years. Another example of new forms of collaboration was Ted and Tristan's

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undertaking of team teaching. Unfortunately these informal collaborations did not include the entire group, as Todd and Teodore were often less involved.

A strong feeling of group accountability was also established among this group of men, which resulted in the expectation that all would attend each meeting. They would check in on the day of the meeting to remind each other of the time and location. When volunteers to facilitate three of the meetings were requested, several members quickly stepped up, and when it was someone's turn, the role of facilitator was treated very seriously. Each facilitator came prepared, having read the materials ahead of time, and was ready to get the discussion started, make contributions, and encourage everyone in the group to share. On two occasions, Tim prepared and brought additional handouts to the meeting—a calendar activity and a poem about mathematics. He shared copies with each member of the group, explained their use, and provided examples. These examples were well received and illustrated one instance where the group took ownership for its own processes.

In an interview, Tim talked about how the no carbon required (NCR) paper and the process of action planning increased his sense of accountability. At the end of each meeting, the NCR paper was used for documenting teachers' action plans. The teachers planned what they would do in the next month in terms of trying out new ideas, continuing with existing techniques, or modifying some aspect of practice. Each kept a copy of what he wrote and submitted a copy to the ETS research staff. Tim noted:

> I think specifically what was helpful was the ridiculous NCR forms. I thought that was the dumbest thing, BUT I'm sitting with my friends and on the NCR form I write down what I am going to do next month. Well, it turns out to be a sort of "I'm telling my friends I'm going to do this" and I really actually did it and it was because of that. It was because I wrote it down and I had it in my little packet and that idea of making improvements and sort of informally, which is much more powerful than formally, committing to doing it. I was surprised at how strong an incentive that was to do actually do something different, so I was happy with that, that idea of writing down what you are going to do and then because when they come by the next month you better take out that piece of paper and say "did I do that" and even if you didn't do it, you KNEW that you made a commitment to do and that's a—you weren't going to write me up, no-body was going to do anything terrible to me—but just the idea of sitting in a group, working out

something, and making a commitment, even something as informal, I was impressed about how that actually made me do stuff.

Tim's comment exemplifies the sense of group accountability that developed over the course of the year. He clearly understood that the project was not just about individual learning, but about the learning of the whole group, and that he had a responsibility to the group.

Impact of the Wider District Context

What makes this group's success story all the more surprising is that while it was one of three TLCs established within the Spruce Central High School, and one of four high school TLCs within the Spruce School District, it was the only TLC that had established a sense of community and a strong sense of group accountability. Attendance was higher at this group than at the others. (For more detailed information on all of the TLCs, see Wylie, Lyon, & Mavronikolas, 2008.)

The wider context in which this TLC operated was not one of mutual support. Relationships with school administration ranged from apathetic at best to antagonistic at worst, as evidenced by comments made over the course of the year by many of the participating teachers. The school administration was aware of the multiple ways in which the ETS research team was supporting teachers in the school, through email updates and face-to-face meetings. However, no one in administration ever attended a meeting or stopped by during a meeting. This experience was quite different from that in a neighboring district where the district level professional development supervisor, the mathematics supervisor, and one of the assistant superintendents each attended at least one TLC meeting.

According to reports, no feedback or encouragement was given to teachers in the project from the school principal or other senior staff. On several occasions the school principal conveyed her vision of quality teaching to her staff in terms of very generalized statements: Students should never be sitting in rows, for example. On one occasion she told them (somewhat hyperbolically) that she would fire a teacher if she saw that the students were not in groups. She appeared not to recognize that the teachers were actively engaged in attempts to improve the learning and teaching in their classrooms.

One concern voiced by the teachers was that they would fall behind the pacing guide set by the mathematics coordinator if they used the TAG materials. The ETS staff tried to provide

research-based reassurance about the importance and value of covering less material well rather than everything in a superficial way. In addition, ETS staff conveyed comments directly from the mathematics coordinator that wiggle room was present in the pacing guide. However this assurance was not borne out in reality since the regular Friday assessments, which matched with the pacing guide, were still distributed by the mathematics coordinator with the implied expectation that teachers were on pace.

Toward the end of the school year, the superintendent indicated that he was willing to provide funding for the program to continue for another year. However, key decisions were not made about where to focus the program: At the high school level? On mathematics? With more teachers? At the end of the year, each teacher in the TLC was informed that stipends and materials would be provided if they wished to facilitate their own meetings. With no tangible school administrative support, formal meetings were never established.

Failure to act in a timely fashion was apparent not only at the end of the school year, but throughout it. One cause of frustration early in the year was a change in the ninth grade algebra and pre-algebra classes. During the first week of November, a number of students in pre-algebra were pulled out and placed in algebra classes. Given the nature of scheduling at the high school (block courses that run only half the year), these changes were made halfway through the course, putting many students at a disadvantage. The teachers viewed these changes as very disruptive and did not support the management decision.

Another example was the procurement of overhead projectors (OHPs). Early in the year, a teacher suggested that the page protector white boards could be used with OHPs. Student work written on one of these white boards could be displayed for the whole class to see by removing the cardboard insert and projecting the work with the OHP. Teachers in the high school indicated that they either did not have an OHP in their classroom or it was broken. In October, an ETS researcher talked with the vice principal in charge of research projects and was assured that all the teachers involved in the project would receive an OHP. By February, the issue was still not fully resolved. While not a major hindrance to the implementation of formative assessment, the situation was indicative of the way in which decisions were made but actions were very slow to follow.

Despite this lack of support from the administration, the TLC group described in this paper seemed to flourish through the members' support of one another. However, most notably,

this section was titled Impact *of* the Wider School Context, in contrast to the Gateway section, which was titled Impact *on* the Wider School Context. Although the Spruce 3 TLC flourished, it was in spite of, rather than because of, its context.

Within Spruce Central High School, with all the accompanying difficulties of a low-performing urban high school, this group of six men not only met regularly for the scheduled visits with ETS staff, but also found time to meet, talk, and collaborate outside of the formal TLC meetings. They did not succeed in bringing anyone else from their department into the group, although they shared information and materials with other teachers and made formal presentations during staff time. Thus, the impact *on* the school culture was limited.

While this one group did not have an impact on entire school in the way that Gail did in her school, the fact that they kept going beyond the requirements was exceptional. Reviewing the data, we asked why this one group took off in a way that the others did not. Two other TLCs within the same school seemed much more affected by the general climate and lack of support. While we cannot empirically answer this question, we can certainly speculate about the influence that the three committed formative assessment users had on the rest of the group. And it may also speak to the generally unanswered need for greater collegiality within schools.

Conclusions

Taking a formative assessment approach to teacher change has been shown to have a high gearing ratio. From these case studies, exposure to and study of formative assessment clearly had a significant impact on the individuals and the groups of teachers, and to a lesser extent, on the schools in which they taught. Small changes had deep and wide-ranging impacts as were seen in particular for Gail. Gail wrote of her pedagogy and the far-reaching effects of this experience in a quote from her journal entries:

> I find assessment for learning to be a mindset and the more I teach, the more I am seeing in these terms. I have been most impressed with how much more involved my students have been in their own learning, knowing what they know and still need to know.

In addition to the impact of formative assessment, evidence shows that the nature and structure of the TLC also had a high gearing ratio and significant effect on all six teachers in the Spruce 3 TLC. These effects are illustrated by the members' consistent participation in the meetings, the way their mutual support permeated their daily practice, and the way they

discussed the TLC and its impact. During a year-end interview, Tim shared the following thoughts on his experience with formative assessment and TLCs:

> But here [school based TLC] we had techniques sort of embedded in this group where, you know, we are talking about problems. And our group really actually talked about problems, and we were all GUYS, and older guys too. We actually talked and that doesn't happen. That doesn't happen, so I enjoyed the group a lot and thought it was very useful.

As efforts to support teacher change have moved beyond these teachers, what can we contribute to the knowledge base on implementing successful teacher professional development? First, a preliminary analysis of the qualitative data indicates that this combination of content and process is effective in changing not only teachers, but also to some extent the culture within schools. Second, some refinements can be suggested. For one, the debrief experience at the start of every meeting has become more formalized into a "How's it going?" session in which the expectation is set that everyone shares at every meeting. This formalization is complemented by a consistent action planning session where everyone answers structured questions about their implementation of formative assessment for the next month. These two activities combined encouragement and accountability within the group, as illustrated by Tim's quote in the previous section. Third, the question "What's formative about that?" has been added to the discourse. The question creates an environment with a greater, more explicit focus on minute-to-minute assessment and a framework within which to challenge those ideas that may be good classroom practice but are not necessarily related to the five key strategies and one big idea of formative assessment. Finally, as districts begin their implementation, they are now asked to consider three questions:

1. Who will be the district level advocate? This advocate must support the teachers, schools, and students in their implementation of formative assessment and be willing to put the initiative first.
2. Who will be the school level advocates? School level advocates should be identified at each school and should help move the initiative forward in the specific circumstances of that school.
3. Can the district support teachers for at least 2 years? When implementing formative assessment, teachers need time to fully understand the concepts and

grow within their own practice. Teachers need to know that they have the ongoing support of the district. In addition the bonds that are formed during TLCs are important but fragile. They need support and attention in order to prosper.

The goal of this report was to provide some insight into the ways in which TLCs provide an opportunity to support teacher growth through the analysis of two case studies that illustrate the experiences of the teachers within two districts. The teachers in each district were exposed to formative assessment through different delivery models, but all participated in some form of a TLC. These case studies illustrated some of the growth that these teachers experienced and also the impact that the school had on them or that they had on the school community.

The two case studies presented provide valuable insight into the processes involved in implementing formative assessment through TLCs. Although both case studies show significant growth in different circumstances, room exists for improvement. Both examples of TLCs are success stories in different ways. In Gateway, with a supportive administration where teachers were encouraged to be innovators, the project flourished and teachers beyond the initial cohort became engaged with the work. Although it was interesting to note that after the first year the original cohort was left on their own but still found some creative ways to continue their learning. In Spruce, school support or lack of it did not hinder this group of men from getting started and having a successful year of TLC meetings. However, the work did not spread to the same extent as it did in Gateway. Similarly, however, support for the Spruce TLC to continue with a second year did not exist and teachers were unable to find a way to continue.

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