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Introduction

In this article we report findings from a professional development study undertaken within a larger integrative research program designed to advance understanding about teacher and student learning (Butler, Schnellert & Cartier, 2005; Butler, Cartier, Schnellert, & Gagnon 2006). Two main objectives drove our research when this project was conceived. These were, first, to develop high-quality, situated, and formative literacy assessments that teachers would find useful in shaping practice, and, second, to investigate how engaging teachers in collaboratively constructing, scoring, and interpreting data might feed into cycles of reflective inquiry, thereby supporting teachers' professional development. Consistent with these original foci, the bulk of this article presents an in-depth, cross-case analysis of the extent to which engaging six teachers in constructing situated literacy assessments fueled their engagement in cycles of inquiry, generated meaningful and sustained shifts in practice, and fostered student learning.

At the same time, this article examines political and social forces that shape a project focused on literacy assessment. Over the past three years, our project has been remolded as it has been affected by political and social agendas, particularly the growing attention focused on literacy outcomes for adolescent learners (Rogers et al., 2006; Snow & Biancarosa, 2003; Strickland & Alvermann, 2004), coupled with the expectation that districts, schools, and teachers should be accountable for outcomes experienced by students (Borko, 2004; Cochran-Smith & Fries, 2005; Earl, 1999; Fitz, 2003; Nuthall, 1999; Shepard, 2000). As interest in our project grew, cutting across teachers, administrators, district personnel, and the Ministry of Education in our Canadian Province, we recognized the opportunity to reframe thinking about "accountability" for literacy outcomes within a multi-level collaborative enterprise. We therefore added a third objective to our research, namely to examine whether situated literacy assessments

can provide both formative assessments useful for guiding instruction and summative data useful for defining, monitoring and accounting for desirable outcomes at multiple levels. Thus, while our research focused most centrally on tracing six teachers' engagement as partners in investigating new approaches to assessing and fostering adolescent literacy, we also examined the conceptions of accountability that emerged across levels as our project unfolded.

In the sections to follow, we start by situating our two main research foci in literature focused on teacher professional development as spurred through data-driven cycles of collaborative inquiry. We then broaden our introduction to consider socio-political pressures on teacher professional development, and indeed teaching practice, that are having an impact not only in Canada, but also in the United States, New Zealand, Australia, and the United Kingdom. Building from these discussions, remaining sections articulate our methodology, summarize findings, and offer conclusions and implications.

Reconceptualizing Teacher Professional Development

Research into teacher professional development has shifted significantly as teaching and learning have been reconceptualized over the last 50 years (Burnaford, Fischer, & Hobson, 2001; Cochran-Smith & Lytle, 1993; Dewey, 1963; Eisner, 2002; Schon, 1983, 1991; Shulman, 1986, 2004; Wilson, Shulman, & Richert, 1987). For example, when considering the nature of teaching (and what teachers have to learn), conceptions have moved from process-product perspectives that focus on teaching as a technical transmission activity to conceptions of teaching as requiring contextualized decision-making (Ball, 1995; Borko & Putnam, 1998; Butler, Novak Lauscher, Jarvis-Selinger, & Beckingham, 2004; Eisner, 2002; Furlong, Barton, Miles, Whiting & Whitty, 2000; Palincsar, 1999; Palincsar, Magnussen, Marano, Ford, & Brown, 1998). This shift has led to a focus on how teachers' knowledge and beliefs mediate their behaviour in classrooms

(Borko, 2004; Bransford, Brown, & Cocking, 2000; Cochran-Smith & Fries 2005; Shulman, 1986), and to research focused on teachers' cognition, knowledge use, and beliefs (Cochran-Smith & Lytle, 1993, 1999). In this study, we built from emerging conceptions of teaching and learning to investigate teachers' reflective, contextualized decision-making as they attempted to make changes in practice and then monitor and account for outcomes associated with the changes they made.

Another trend in recent research on teacher professional development has been the development of collaborative models designed to engage teachers jointly in inquiry-based, longitudinal, and critical examinations of practice (Carpenter, Fennema and Franke, 1996; Englert & Tarrant, 1995; Gersten, 1995; Henry et al., 1999; Loughran, 2002; Luna et al., 2004; Morrell, 2004; Robertson, 2000). These initiatives extend professional development activities from formal settings (e.g., workshops) into authentic communities of practice within or across schools wherein individuals work together to situate emerging knowledge and beliefs. Consistent with these trends, we investigated processes associated with teacher professional development when teachers are engaged in collaborative, self-reflective cycles of inquiry within authentic communities of practice. We investigated the individual and common ways in which participating teachers engaged reflectively in cycles of goal setting, planning, teaching, and monitoring, and how involving them in creating, interpreting and using assessment data enhanced their engagement in cycles of inquiry.

Our Professional Development Model

In this research study, university researchers and classroom teachers engaged collaboratively in instructional change cycles (see Figure 1) wherein they collected and interpreted assessment data, set instructional goals, co-constructed instructional strategies,

enacted new practices, monitored outcomes, and decided on further action (Butler, Schnellert & Cartier, 2005). Responding to calls for situated "assessments for learning" designed to guide instruction (i.e., formative assessment) (Black & Wiliam 1998a; Clarke, Timperley, & Hattie, 2003; Earl, 1999; Firestone, Fitz, & Broadfoot, 1999; Hill, 2003; Shepard, 2000; Sloan & Kelly, 2003; Stiggins, 2002), we focused particular attention on ways in which the teachers drew on assessment data both to ground instructional decision-making and to monitor outcomes for students.

In our professional development model we draw on a model of self-regulated learning to characterize teacher's collaborative engagement in instructional change cycles (Butler & Cartier, 2004; Zimmerman & Schunk, 2001). Self-regulation refers to approaches used to self-direct engagement within goal-directed activity. Self-regulating strategies are employed by teachers to plan learning approaches and manage resources, monitor the advancement of students, make adjustments to instruction, monitor and manage their own motivation and emotions, and self-evaluate whether they are achieving objectives. For teachers, professional learning experiences that explicitly foster self-regulating processes can result in enhanced awareness of links between instructional practices and student learning (Butler, 2005; Butler et al., 2004).

Note that while models of self-regulation characterize individuals' agency in goal-directed behaviour, these models also focus on the interface between the social and individual, describing multiple interacting factors that shape individuals' adaptation within varying historically-, socially-, and culturally-circumscribed settings (Butler, 2003; Zimmerman & Schunk, 2001). Thus, in our research, we drew on a socioconstructivist model of self-regulation (Gergen, 1985; Paris, Byrnes, & Paris, 2001; Stamps, 1997) to examine how goal-directed processes were

collaboratively co-constructed by teachers within communities of practice operating within a particular socio-political context (Butler, 2005; Butler et al., 2004).

It should also be noted that our research focused simultaneously on student and teacher self-regulation, because teachers' goals within this project were to support adolescents' self-regulation of a key literacy activity in schools, namely "learning through reading" (LTR) (Borkowski, 1992; Butler, 1998; Butler & Cartier, 2004; Butler, et al., 2006; Cartier, 2000; Zimmerman & Schunk, 2001). Indeed the data collection tools we developed with teachers assessed student self-regulation and knowledge construction while engaged in LTR (see Figure 1). Thus, in parallel to our professional development model wherein we sought to promote *teachers'* self-reflective inquiry into teaching practices, teachers' goals were to promote *students'* mindful self-direction of learning processes (Butler et al., 2004, Butler, Carter, Schnellert, Gagnon, Higginson, & Giammarino, 2005).

Thus, at one level, our hope was that teachers would establish collaborative communities of inquiry within their classrooms centered on collaborative, strategic engagement in LTR activities. But at a second level, we also hoped that teachers might draw students into their own inquiry cycles focused on linking instruction to student needs (see Figure 1), for example by sharing assessment data with students (about literacy outcomes and processes), setting goals together based on data, co-constructing strategies with students, and tracking growth towards shared goals. Thus, while in this report we attend most to tracing teacher learning and inquiry (e.g., documenting decisions and actions of teachers and data-based shifts in practice), we would emphasize that our ultimate, collective goal was for teachers to engage students in communities of inquiry so as to foster their active, strategic engagement in learning.

While professional development approaches similar to ours also describe "assess-plan-implement-reflect" cycles (Barnett, 2004; Borko, 2004; Guskey, 2002; Robertson, Hill & Earl, 2004; Southwest Educational Development Laboratory, 2005), our work extends this prior research by studying how reflective inquiry cycles can support idiosyncratic and situated shifts in knowledge and practice for teachers working collaboratively to achieve common goals. In our study, we expected teachers to reflect on assessment data to derive implications for classrooms, recognizing that some collaborative teams might emphasize similar issues or strategies. We also supported teachers to reflect on potential instructional approaches that might help in achieving identified objectives (by sharing resources; in school-based meetings with colleagues and/or researchers; through co-planning and co-teaching; in district-level workshops). But we did not constrain teachers to respond to the data in any predetermined way. By tracing how individual teachers bridged from assessment to instruction, we were able to observe teachers in the midst of interpreting data so as to inform contextualized decision-making.

Thus, in our project, we drew on a situative perspective of teacher learning and professional development to encourage teachers to look for both individual and common interpretations of data and courses of action. Participating teachers assisted in generating data specific to the contexts within which they were teaching. Then, teachers, researchers, and in some cases students worked in teams to deconstruct assessment results from multiple perspectives (Britzman, 1991; Little, Gearhart, Curry & Kafka, 2003; Nuthall, 1999). Ultimately, teachers selected individual and/or shared courses of action based on the unique profile(s) of their class(es), consideration of possible pedagogical practices, and context-specific factors (e.g., curricula; inclusion of students with special needs).

Teacher Professional Development and Accountability

Communities of practice do not work in isolation from external forces or internal tensions. Recent meta-analyses have identified two critical lenses that can be applied when considering teacher professional development: one focused on learning processes; the other on the influence of external factors such as governmental programs and educational policies (Borko, 2004; Cochran-Smith, 2004; Cochran-Smith and Fries, 2005; Darling-Hammond, 1996; 2000; Furlong, 2001; Shepard, 2000; Winter, 2000). Most relevant here is the emphasis on accountability as seen over the past two decades in New Zealand (Timperley & Phillips, 2003), the United Kingdom (Fitz, 2003; Furlong et al., 2000; Furlong, 2001; Lewis, 2004) and more recently North America (Cassidy & Cassidy, 2005; Darling-Hammond, 2004; Darling-Hammond, Ancess & Ort, 2002; Earl, 1999; Sullivan, 1999; Taylor & Tubianosa, 2001; Volante, 2004; Wickstrom, 1999).

It is clear that teachers, administrators, and policy-makers share a concern with ensuring that educational practices promote important learning outcomes. On one hand governments are concerned with documenting positive outcomes for students associated with investments in education. Simultaneously, educational reform movements are setting ambitious goals for student learning (Borko, 2004; Darling-Hammond, 2004; Firestone, Fitz & Broadfoot, 1999), and members of the international research community are considering how to link professional development to data (Borko, 2004; Darling-Hammond, 2000; Gilmore, 2002; Hextal & Mahony, 2000; Hill, 2000, 2003). The result is that educational scholars and policy makers alike are calling for teacher professional development and instructional practice that result in measurable student gains (Borko, 2004; Darling-Hammond, 2004; Cochran-Smith, 2004; Cochran-Smith & Fries, 2005; Firestone, Fitz & Broadfoot, 1999; Gilmore, 2002; Hill, 2003; Timperley & Phillips, 2003). In spite of this potential common ground, however, it has been difficult in many contexts

to define roles, relationships, and responsibilities in a way that engages teachers, parents, administrators, and policy makers as partners in educational reform and change.

For example, in 2007, most Western nations have governmentally-mandated education policies designed to link decision-making at all levels (classroom, school, district) to measurable increases in student achievement. But, while governmentally-defined accountability requirements may spur district- and school-level reform, concerns have been raised about the roles of teachers, schools, and districts within governmentally-imposed school improvement and accountability initiatives (Cochran-Smith & Fries, 2005; Earl, 1999; Fitz, 2003, Harold, Robertson, Southworth & Williams, 1997; Winter, 2000). Thus, in our research we consider how a productive interface can be established that connects teachers' engagement in data-driven cycles of inquiry with district- and government-level policies or initiatives so as to foster meaningful change at the classroom level.

Another issue concerns the nature of the data that should be fed into monitoring student progress and accounting for results. For example, Cochran-Smith (2004) and others (Biesta & Medima, 2002; Britzman, 2000; Eisner, 2002; Furlong, 2001; Winter, 2000) caution that a narrow focus on results from standardized tests may result in a correspondingly narrow definition of teacher and student knowing/learning and may (unintentionally) drive professional development mandates back towards technical rationality. Our research proposes a novel approach for reconciling tensions between accountability frameworks and contextualized professional development. As an alternative or complement to larger-scale assessments, we investigate how engaging teachers in co-constructing and analyzing situated assessments produces both formative and summative data that can be useful not only for teachers in their

efforts to improve practice, but also for administrators or policy makers interested in supporting instructional change that leads to measurable gains for students.

A final complexity in linking data to practice requires defining how to conceptualize relationships between "monitoring" student outcomes and the imperative to "account" for student achievement to oneself and/or others. Our professional development model certainly engages teachers in monitoring their own and their students' learning in relation to the professional and instructional goals they set. But monitoring can transpire at multiple levels, for example when students actively monitor progress towards achieving task criteria; a school administrator monitors progress towards school-based objectives; and/or a district monitors gains in literacy based on data aggregated across schools. Thus, monitoring can be internal (i.e., monitoring one's own actions or decisions) and/or external (i.e., monitoring links between goals and outcomes based on data collected with or by others). "Accountability" also can be external (to others) and/or internal (to oneself) and can be multilayered (e.g., accountability to students, parents, teachers, administrators, policy-makers). However, to be "accountable" adds the expectation that one is responsible to someone for some action (Fitz, 2003). So, for example, teachers "account for" outcomes when they link thoughts, intentions, and actions to their responsibilities to students; and districts are "accountable" to governments when they document how actions taken are linked to student achievement. Indeed, current trends are pushing towards a complex, multidirectional definition of accountability, where teachers, students, parents, and school districts are increasingly asked to engage in and be responsible for educational decision-making, and to account for goals and methods in relation to outcomes observed.

In our research, we examine whether accountability at multiple levels can be achieved by fostering monitoring within multi-layered and coordinated cycles of reflective and collaborative

inquiry (see Figure 2). Our contention is that meaningful connections between accountability frameworks and shifts in classroom practice can be forged by engaging students, teachers, parents, school teams, administrators, districts, and policy makers in collaborative, data-driven cycles of inquiry, if data collected are meaningful for guiding shifts in practice at the classroom level. Thus, in the study enacted here, we investigated how teachers used data collected within their own classrooms to generate goals for students, monitor gains and make responsive decisions, and ultimately account for outcomes observed. We also studied the extent to which the situated data we generated with teachers supported monitoring and accounting for progress across levels (e.g., by teachers to students; by a school to a district; by a district to government).

A Canadian Context

We conducted this research within an urban, multicultural school district on the west coast of British Columbia (BC), Canada, which established the socio-political context within which our project unfolded. In Canada, education falls within the jurisdiction of provincial governments. Student achievement-based reform agendas have recently been introduced in several Canadian provinces including Alberta, BC, and Ontario (ushered in by newly elected neo-liberal governments). For example, in 2001, the BC provincial government instituted an accountability cycle requiring school districts and schools to develop goals, means of measurement and implementation plans. School Planning Councils (SPCs) were also legislated into the BC School Act, increasing the voice of the public in setting and monitoring progress towards school goals. This decentralized approach requires data-driven accounting for student achievement to the provincial government, but at the same time supports local decision-making and provides flexibility in how school communities develop goals and document outcomes.

The urban, multicultural school district within which this study was conducted was also highly decentralized in terms of decision-making structures. Thus, while some neighboring school districts responded to the provincial call for accountability by defining goals and strategies centrally, our host district encouraged schools to set local goals collaboratively with their SPCs. The resulting challenge for schools, however, was to define methods for collecting data that would support accounting for outcomes, and at the same time be maximally informative for driving instructional change in classrooms. Note that our host district also explicitly values inquiry-based approaches to professional development.

The Evolution of a Multi-Layered Project

The seeds of our project were planted eight years ago when author (lead researcher) was invited by school district consultants to speak with secondary teachers about strategies for promoting active, strategic learning by students. Across the next five years, a sequence of collaborative projects emerged focused both on promoting student self-regulated learning (e.g., Butler, 2005), adolescent literacy (Butler et al., 2004) and teacher professional development (e.g., Butler, Novak Lauscher, & Beckingham, 2005).

In the sixth year of collaboration, three chains of events converged to link the research program with larger movements at the district and Ministry levels. First, Deborah Butler and her colleague, Sylvie Cartier, turned their attention to the development of a situated LTR assessment tool, the Learning through Reading Questionnaire (LTRQ), designed to tap into students' perceptions about the requirements of LTR activities and engagement within them (see Butler & Cartier, 2005; Cartier & Butler, 2004). Simultaneously, teachers and district consultants identified adolescent literacy as a key issue and priority (Schnellert, Campbell, Loat, Rollo, & Widdess, 2004). Finally, the provincial government in British Columbia (BC) introduced the

new accountability framework requiring school boards to generate accountability contracts (Halbert & Kaser, 2002), as described above. Again, districts could set their own priorities and plans, but needed to document outcomes with data. The participating district chose to continue attention to adolescent literacy, but at the time, only large-scale, provincial assessment data were available to help teachers and schools in accounting for outcomes (Rogers et. al, 2006).

It was here that our current project emerged. As the accountability framework in our host district evolved, district-level consultants (including this article's lead author) started to work with teachers to define and develop classroom-based measures to complement provincial assessment data. Butler and Cartier's LTRQ was drawn into the project as part of a situated assessment package, while teachers and researchers also worked together to develop a performance-based assessment (PBA) (Brownlie, Feniak, & Schnellert, 2006). These tools were designed to both support instructional revision (e.g., formative assessment) and track outcomes associated with instructional change (i.e., summative assessment).

In the end, teachers' and researchers' joint interests in adolescent literacy and developing responsive assessments converged with movements at the international, provincial, and district levels to create an invaluable opportunity for research. Ultimately, our project was shaped by an international trend towards accountability, a provincial mandate for districts to use data to set and monitor goals, and a district's willingness to let school communities play a key role in goal setting and monitoring. The political trend towards accountability across jurisdictions not only propelled this project forward, but at the same time alerted us to how our investigation was being impacted by external pressures.

Methodology

Our initial goals, as introduced at the outset, were to understand: (1) whether situated literacy assessments would provide data that teachers found useful in shaping practice and monitoring the progress of students; and (2) how engaging teachers in collaboratively constructing, scoring, and interpreting data might feed into cycles of reflective inquiry, thereby supporting teachers' professional development. To address these two main questions, we conducted an in-depth, cross-case analysis of six teachers' professional development at one of four participating schools (Merriam, 1998; Pintrich, 2000; Yin, 2003). But our third goal was to consider how our project was shaped and responsive to socio-political trends unfolding in the province and district. Therefore, we also examined how situated literacy data were used in setting goals and accounting for adolescent literacy outcomes at multiple levels.

Participants

Participants for this study were drawn from a larger project investigating how situated assessment data might assist teachers in fostering adolescent literacy (see Butler et al., 2006). Thirty teachers from four schools participated in this larger project. The subset of teachers included in this research came from a 2-year-old school at the grade 7 to 9 level. The school offers two main programs open to students with a wide range of backgrounds and skills from across the district: a Science Academy and a Fine Arts Academy. We selected this school because our relationships with participating teachers were best developed, and because this selection included teachers who showed differing patterns of engagement. All of the teachers at this school who were part of the larger project ($\underline{N} = 6$) agreed to participate in this more focused study. Figure 4 provides background information about participating teachers, including their levels of teaching experience, which ranged from 5 to 25+ years. Table 1 overviews the number

of students enrolled in participating teachers' classrooms.

Procedures

As part of this project, teachers and researchers worked together to set instructional goals and monitor outcomes using two complementary, situated, literacy assessments: the Learning Through Reading Questionnaire (LTRQ) and a Performance-Based Assessment (PBA). The LTRQ (Butler & Cartier, 2005; Cartier & Butler, 2004) provides information regarding students' motivationally-charged beliefs (e.g., self-perceptions of competence), emotional reactions (e.g., stress or frustration), use of cognitive strategies for reading and learning (e.g., making connections), and use of self-regulating strategies (e.g., planning, self-monitoring, adjusting approaches when challenged). Teachers defined how they wanted the LTRQ data to be reported (e.g., at the class, department, grade, and/or school levels). Then graphical summaries were provided by researchers at the levels requested. These summaries profiled students' responses to questionnaire items (i.e., the percentage of students who endorsed items as *often* or *almost always* true of them) related to main topics addressed by the LTRQ (e.g., planning). Two examples of a summative display comparing Fall and Spring responses are presented in Figures 3a and 3b.

The PBA (Brownlie et al., 2006) includes a written product and oral interview on the basis of which teachers judge the quality of students' knowledge construction when reading (e.g., identifying main ideas, making inferences) and infer students' application of strategies for determining meaning at the word and discourse levels (making predictions, making connections, determining importance, recognizing important details, identifying main themes, creating a summary). Teachers and researchers followed a shared protocol to collaboratively score the

PBAs in accordance with BC's Performance Standards for Reading Information rubrics (BC Ministry of Education, 2002).

Administration of the LTRQ and PBAs was coordinated and took place within two consecutive class blocks at the beginning and end of the school year. In each assessment, students were first shown a portion of the text that they would be reading as part of a classroom literacy task (i.e., a preview of the PBA). They then filled out the LTRQ with that task in mind. In the next class students completed the PBA. Taken together, the LTRQ and PBA captured students' motivation, emotion, cognition, self-regulation, and comprehension/learning during an LTR activity. Note that five teachers used both tools in the Fall and Spring, but one teacher (Daphne) did not use the LTRQ in the Fall because she was new to the school and project.

In collaborative professional development activities designed to integrate these assessment data into collaborative cycles of inquiry, researchers worked with teachers to: (1) situate, administer, and interpret data from the LTRQ, (2) develop, implement, and score the PBAs, (3) reflect on the meaning of data and set goals (immediate and long-term), (4) identify, plan, enact and reflect on instructional strategies, and (5) refine instruction over time. Figure 5 presents an overview of researcher-teacher collaborations as they unfolded. Teachers also had opportunities to participate in adolescent literacy themed workshops at the school and district levels.

Data Collection

Data sources for investigating teachers' engagement in data-driven cycles of collaborative inquiry included teacher interviews, field notes from planning meetings and classroom observations, classroom artifacts (e.g., lesson plans; graphic organizers; student work), and LTRQ and PBA data. Teacher interviews were conducted in a conversational format with two researchers present (Tuhiwai-Smith, 2001). Six broad questions were used to focus attention on

the meaning(s) teachers were making of assessment data and how they were approaching goal setting, planning, implementing and reflecting (Schnellert, Higginson & Butler, 2006). Teachers brought data displays and classroom artifacts to the interviews to assist them in telling their assessment to instruction stories (Clandinin & Connelly, 1990). When a teacher referred to displays or artifacts, a researcher asked about the teacher's goal setting, planning or enactment of related strategies. Field notes were recorded throughout the school year during and/or immediately after any interaction between researchers, teachers, and/or administrators, to the extent that these individuals initiated further contact with researchers (see Figure 5).

The above case study data were also useful in understanding how our project was shaped by socio-political trends unfolding in the province and district. For example, in interviews and during observations, teachers spoke about how situated literacy assessments were important, not only in shaping classroom instruction, but also in monitoring and accounting for outcomes at the school level and/or to parents. But we also extended our data collection to include documents that provided evidence of whether and how our situated literacy assessments were connected to accountability frameworks at multiple levels. These documents included the BC Ministry of Education's 2001 accountability framework; the Ministry's call for district-level proposals for an additional literacy-focused funding initiative; our host district's overall accountability contract and proposal for accessing additional literacy funding; a professional development plan developed by the district; and other accountability plans and proposals for literacy funding developed by the four schools in our larger project.

Data Analysis and Interpretation

Interview transcripts served as the primary source of data for investigating teachers' engagement in self-reflective cycles of inquiry, while field notes, documents, and other artifacts

were systematically consulted for confirming or disconfirming evidence. To begin, provisional themes were derived from a systematic analysis of interview data (Merriam, 1998). Interviews were transcribed and line numbers assigned to the transcripts. Next, two researchers independently read through data to look for emerging themes within and across teacher interviews (Lincoln & Guba, 1985; Merriam, 1998). The two researchers met to share proposed themes, presented the themes to the larger research team for feedback, and revised the set of codes. They then independently coded the interviews. In this final step, the application of the revised codes was highly consistent, and the few disagreements were resolved through discussion. Note that, in these thematic analyses, data from all six cases (i.e., teachers) were considered simultaneously to create a common, inclusive set of codes, an approach that supported our cross-case analysis of the six teachers' professional development.

Once the data were coded, tables were constructed that summarized themes and allowed us to discern patterns (e.g., Table 2). Rows were constructed for each of the codes assigned; columns were constructed for each teacher. Recorded within each cell was the referent for each piece of data (e.g., line numbers from the interview transcript). With the interview data displayed in a graphic manner, we could both establish the distribution of responses across teachers and ensure that our interpretation of the meaning of findings included all evidence related to a given theme. Findings were derived from cross-referencing an in-depth analysis of interview responses as displayed across the data tables (Miles & Huberman, 1994) with other data sources (e.g., classroom artifacts, field notes). It was through this analytic approach, including a systematic search for disconfirming and confirming evidence, that conclusions were generated and warranted (Howe & Eisenhart, 1990).

To answer our third research question, we systematically reviewed interview transcripts and field notes to uncover teachers' perceptions about uses of situated literacy assessments at the classroom, school, or district levels. We also analyzed documents to consider how data sources (i.e., large-scale provincial assessments, PBAs, LTRQ) were linked to instructional planning, outcome monitoring, and accountability at multiple levels. We also focused particular attention on how discourse in documents linked uses of data to teacher professional development and/or represented conceptions of accountability.

Results

In upcoming sections, we present our findings in relation to our research questions, focusing sequentially on whether: 1) co-constructed assessments provided data that teachers found useful in shaping practice so as to meet the needs of their students; 2) engaging teachers in collaboratively constructing, scoring, and interpreting data fostered professional development, and 3) situated data were useful in meeting accountability expectations at multiple levels.

Situated Literacy Assessments as Linked to Teacher Practices

In this section we describe the extent to which teachers were able to make sense of formative assessment data to target the needs of students and make responsive revisions to practice. To accomplish this, we describe how teachers engaged in instructional change cycles (see Figure 1) to: (a) build from formative assessment data to identify student needs and set goals, (b) plan and enact targeted instructional strategies, and (c) interpret summative outcomes for students. To facilitate our cross-case analysis, we summarized our findings into another display (Miles & Huberman, 1994) that chronicled each teacher's engagement in each step of the cycle (see an example for Lisa in Table 3).

Using formative assessment to identify student needs and set goals. During planning meetings and end of year interviews (see Table 2, row 1; Table 3, column 1), all six teachers discussed at length new insights they had gained about students' needs based on formative data. All six teachers also described how they had selected goals based on needs they perceived for students (see Table 2, row 2; Table 3, column 2).

Teachers set both common and unique goals based on their review of the data. For example, most teachers found that their students had trouble drawing inferences, making connections, and identifying main ideas (on the PBA). They also noticed that not many students reported using active meaning making strategies (on the PBA or LTRQ), such as finding links between information, that might foster better comprehension and learning (Dole, Duffy, Roehler, & Pearson, 1991; Duke & Pearson, 2002). Thus, the teachers collectively decided to focus on three common areas: drawing inferences, making connections, and determining importance.

At the same time, there was variety in the goals emphasized by teachers as they examined class profiles. For example, George (Science 7, Science Academy) was encouraged that his students were confident and reported using both basic reading strategies (e.g., linking what they were reading to prior knowledge) and more active meaning making strategies (e.g., making connections) than was the case in other classes (LTRQ). However, he noted that his students were not actually very competent at determining importance, finding links between ideas, and interpreting important vocabulary (PBA), and was discouraged that his students perceived memorization to be the most important strategy (LTRQ). He also noticed that his students had trouble decoding and interpreting important vocabulary words (PBA). Thus, in addition to endorsing the team's common goals, George prioritized building word skills and decreasing his students' emphasis on memorization.

Nancy was also teaching Science 7, but in the Fine Arts Academy. After reviewing her class' assessment data, Nancy felt overwhelmed by the multiple challenges they experienced (lines 69 to 70). Like George's students, members of her class struggled to make connections, draw inferences, and distinguish between main ideas and details (PBA). But her students were also less confident (LTRQ), reported little planning or monitoring (LTRQ), and seemed unaware of important cognitive strategies like regrouping information by subject (LTRQ/PBA) or using text features to build comprehension (LTRQ/PBA). Thus, in addition to the team's common goals, Nancy prioritized goals for her class focused on motivation, planning, self-monitoring, and using text features to support comprehension.

Daphne's (Humanities 8, Science Academy) students did not complete the Fall LTRQ. But during the PBA scoring and group debriefing, Daphne noted that her students also struggled to make connections and identify main ideas. Like Nancy's students, they paid little attention to text features. But she also noted that her students misinterpreted PBA questions and "barreled through" the PBA without rereading or checking their work. Thus, in addition to team goals, Daphne added a goal to support her students in interpreting task requirements.

After listening to the reflections of other teachers, Alex (Humanities 8, Fine Arts Academy) identified problems for his students in making connections and locating main ideas. However, Alex focused more attention on patterns he observed from the LTRQ. He was troubled that, compared to other classes, his students reported more stress and less control over outcomes. Thus, he made it his priority to improve his students' "emotions and motivations" profiles. As he explained in his Spring interview, "I learned that I needed to focus on getting them excited about what they were doing and *then* start showing them the skills" (lines 155 to 156).

Wanda (Humanities 9, Science Academy) was content to work on the three goals set by the team. Her review of formative assessment data showed that her students also struggled to make inferences and distinguish between main ideas and details (PBA). They made limited/simple connections (PBA) and showed a lack of interest in LTR (LTRQ/PBA).

Lisa (Humanities 9, Fine Arts Academy) described her students in the Fall as lacking "an understanding of what reading was all about" (lines 36 to 39). Comparing LTRQ to PBA data, she noted that, "while they had all this confidence, they had very little skill" (line 34). She was concerned that her students did not perceive LTR tasks as requiring much planning or strategy use (LTRQ/PBA), and that students also struggled to make inferences, identify main ideas, and make connections (PBA). In the end Lisa adopted the team's goals, but also added goals focused on interpreting tasks, setting goals, planning, and monitoring/reflecting (see Table 3).

In general, we found that the needs teachers identified for students cut across components of LTR engagement assessed in our tools (i.e., emotions, motivation, cognitive strategies, self-regulation, and comprehension/learning). Teachers compared information from the two assessments to reinforce a conclusion (e.g., low reported strategy use on the LTRQ consonant with low performance on the PBA) or identify important discrepancies (e.g., confident students who were not very skilled at LTR). Teachers set common and unique goals that could be directly linked to their interpretation of data and the contexts in which they were teaching. During the year, teachers referred back to these goals during team and individual planning meetings.

Strategy planning and enactment: What did teachers do in their classrooms? Teachers brought classroom artifacts with them to end of the year interviews to help in describing strategies planned and enacted in classrooms. Thus, we had at least two sources of data (i.e., interviews and artifacts) on which to base our description of instructional changes. But we had

additional data for teachers who asked for assistance from researchers during the year (see Figure 5). Neither Wanda nor Alex did so, but each of the remaining teachers (Nancy, Lisa, George, and Daphne) participated in at least one co-planning meeting and one co-taught lesson. We had the most data for Lisa and Nancy, who co-planned with and invited researchers into their classrooms on multiple occasions.

In general, we found that all teachers made changes that were responsive to assessment data (see Table 2, row 4). For example, during his interview, George spoke at length about how he introduced portfolios as an alternative to exams to encourage his students to look for overarching concepts rather than focus on memorization. George also employed strategies to enhance his students' vocabularies and word skills. He asked students to read aloud to identify patterns across unfamiliar words. He taught Science-specific roots, prefixes and suffixes. He provided opportunities for students to reread and figure out words in context. In response to team goals, George started by supporting students to use strategies for accessing prior knowledge. He taught students note-taking strategies to help them learn how to identify important information. He also helped students "chunk text" (Harvey & Goudvis, 2000; Tovani, 2004) and summarize what they had read in each section.

Although instructional change was evident for all teachers, we observed differences among teachers on three related dimensions, reflecting the extent to which they: (1) asked researchers to help in identifying and enacting new instructional strategies; (2) could articulate specific shifts in their instruction; and (3) made instructional shifts that were integrated into practice and sustained over time. In this respect, our findings portray how challenging it can be for even highly motivated and/or experienced teachers to make and sustain instructional change.

Alex (Humanities 8, Fine Arts Academy) could be located at one end of a continuum defined by these three dimensions. Alex requested little assistance from researchers outside of team meetings. In the Spring, his description of changes effected was very general. For example, to support students' emotions and motivation, he described modeling language for students to use when discussing ideas and an excitement for content and learning. Other changes he made were not sustained over time. For example, Alex tried incorporating agendas into student routines to build independence. But he abandoned this strategy quickly due to students' lack of compliance and indiscernible gains in organizational habits. We concluded that Alex did make changes based on his perception of the greatest needs of his students (i.e., motivation/emotions). But he did not deliberately implement or sustain other strategies specific to his students' LTR.

Unlike Alex, Wanda (Humanities 9, Science Academy) committed to working towards the team's three main goals. However, like Alex, she accessed little support from researchers or peers, and she struggled to integrate and sustain changes within her practice. The exception was that she successfully wove attention to "making connections" into her instruction. For example, she modeled for students how to make connections, built in opportunities for students to practice making connections without a teacher in the lead, and required students to discuss connections they made within literature circles. However, like Alex, Wanda perceived resistance from students and so she stopped trying to integrate other strategies into her teaching. In the end, both Wanda and Alex felt they made gains with their students in areas they had targeted, but neither perceived themselves as having made overarching changes in their instructional practice.

George and Daphne (Humanities 8, Science Academy) fell somewhere mid-way on our three-dimensional continuum. Each participated in at least one co-planning session with the researchers, articulated specific instructional changes, and integrated a range of changes into

their practice. Changes that George effected were described earlier. To help her students find main ideas, Daphne initially focused on supporting students' use of note-taking strategies (e.g., mind mapping, two column notes). Daphne also worked with a researcher to co-plan and co-teach two lessons using guided comprehension strategy instruction. Strategies included in these lessons assisted students in finding a reading focus, recording connections while reading, and identifying reading goals.

Like Wanda and Alex, George and Daphne also felt that the changes they made to their practice had a positive impact on their students. But even by the end of the year Daphne was not confident that she had made a shift in practice that was "working" fluently (field notes, Jun 28/05). Both George and Daphne expressed uncertainty about how to scaffold support to students to help them use cognitive (e.g., reading comprehension) strategies. Encouragingly, their experiences in the research fueled their desire to continue engaging in instructional change cycles. They wanted to learn more about how to integrate and sustain what they were learning within their ongoing teaching (field notes, Jun 28/05; Sep 29/05).

The two teachers for whom we had the most information were Nancy (Science 7, Fine Arts Academy) and Lisa (Humanities 9, Fine Arts Academy), who fell on the far side of our continuum. Each interacted regularly with researchers to work through instructional change cycles (e.g., planning, enacting, monitoring, revising). Each was able to reflect on and articulate how they had made and revised instructional changes over time. Evidence suggested changes were well-integrated and sustained within their classrooms.

For example, Nancy worked closely with the research team to explore instructional goals and co-plan and co-teach lessons focused on reading comprehension strategies (Duke & Pearson, 2002; Moore, Alvermann, & Hinchman, 2000). Across the year, Nancy taught note-taking,

imaging, connecting, questioning, and categorizing strategies. In her interview, she explained in detail how she worked with students to help them build cognitive strategies. For example, Nancy used "graphic organizers…to help the students focus their thinking… to find the main idea versus what they consider to be interesting" (lines 176 to 182). She explained that she "really had to unpack that and do a lot of modeling and talk time of what that looked like" (lines 185 to 187). When she felt students were not successfully integrating a strategy into their repertoire, she revisited the strategy several times over an extended period of time: "I would say three or four times over not just one week, like over 4 weeks. But the chunking was frequent, like I would say, every day for 3 or 4 weeks" (lines 243 to 248). From Nancy's perspective one of the most important insights she applied was to incorporate dedicated and multiple opportunities for students to develop and apply a clearly articulated strategy when engaging in LTR.

Lisa maintained the most regular contact with researchers, both face-to-face and by e-mail (see Figure 5). She met with one researcher monthly to discuss her teaching and generate ideas for lessons. The researcher co-taught four lessons with Lisa and observed on four occasions. Evidence suggested that Lisa made substantial changes to practice that she could articulate in great detail (see Table 2, row 4; Table 3, columns 3 & 4). For example, to foster goal setting, Lisa created regular opportunities for students to articulate a purpose for reading:

> They had to have a goal for reading everything they sat down to read. That was not only with literature in English, but also with the text in social studies …they had to have a reading goal … (lines 304 to 308).

She and the researcher also developed a lesson structure to help students connect to, process and reflect on what they read. To help students in making connections, Lisa modeled and scaffolded her students' strategy development until they were able to demonstrate independence. She

decreased the amount of teacher talk and increased partner talk to encourage students to explain their thinking. This permitted her to observe how well students were applying a strategy.

In sum, our findings were that all teachers made instructional changes that could be linked to the goals they set after reviewing formative assessment data, although the degree to which those changes were integrated into and sustained within practice varied across teachers. Our cross-case analysis suggested that observed differences in practice shifts could not be related to years of teaching experience (e.g., Lisa and Nancy, the most generative teachers, were very experienced and relatively new, respectively). Instead, the extent to which changes were embedded into teachers' practice seemed to be associated with the extent to which they regularly engaged in collaborative cycles of reflective inquiry with researchers and/or colleagues.

Another observable pattern, worthy of further investigation, suggested that teachers' success at instructional innovation may have been related to how and whether they engaged students as participants in interpreting data and defining needed instructional strategies (see Figure 1). For example, both Alex and Wanda, who made the fewest sustained changes, remained noticeably teacher-centered. Both simply explained to students where improvement was needed and how they could get better in those areas. When students balked at an approach, these two teachers persisted for a time, but ultimately abandoned an innovation. The two teachers who made mid-level changes (i.e., George and Daphne) sought to involve students in developing methods for addressing gaps apparent in formative assessment data. By the Spring, Daphne had started engaging students in developing performance criteria. However, in end-of-the-year interviews, each noted that they had taken responsibility for goals and outcomes rather than viewing students as partners in the development and success of an innovation. In contrast, the most successful teachers in terms of making change (i.e., Nancy & Lisa) actively engaged their

students in dialogue about data, instruction, and learning strategies (thereby bringing students into their own process of inquiry) as well as in actively self-regulating their LTR engagement. Each shared data with students and invested class time eliciting students' definitions of what good readers do, co-constructed conceptions of what LTR tasks require, and negotiated goals, standards, and strategies with their classes. By the Spring, Lisa was asking her students to develop their own strategies based on their reading and learning goals. Thus, it is possible that those teachers who engaged students more actively as partners encountered less resistance and/or found it easier to sustain instructional change.

A final, notable pattern in the data was that, while five of the six teachers commented on their emotional responses during the project (Table 2, row 5), Lisa and Nancy described the strongest reactions to the summative assessment data, suggesting their significant emotional investment in making and evaluating outcomes associated with shifts in teaching practice. Perhaps teachers' level of emotional investment could be associated with their perseverance in instructional change cycles, even when difficulties were encountered.

Reflection on summative assessment data: What could teachers tell us about post-test results?

In this section, we focus on teachers' interpretation of summative assessment data in relation to the goals they set and the instructional changes they made. Based on their review of summative assessment data, five teachers observed positive changes in the LTRQ data that could be linked to their goals and instructional changes enacted (all but George). For example, Alex observed gains in students' sense of control over outcomes, emotional reactions when LTR, and strategies used to manage motivation and emotions. Similarly, Wanda was pleased that her students reported greater use of strategies for using text features (e.g., titles), making links, and summarizing in their own words.

Not surprisingly, the most substantial gains on the LTRQ were observed for students in Nancy's and Lisa's classes. For example, LTRQ data evidenced gains for Nancy's students in perceptions of confidence, endorsement of meaning-making strategies (e.g., paying attention to important ideas, applying, summarizing, regrouping, linking) and monitoring. Similarly, Lisa's students evidenced gains in confidence, task interpretation, cognitive strategy use, and self-regulation (see Figure 3-b). Note that Lisa was the only teacher to address a goal focused on planning, and her class was the only one to made gains in that area (see Figure 3-a). These findings suggest that the assessment tools assisted teachers to monitor outcomes that were meaningfully linked to the instructional changes in the contexts in which they were working. Further, while more research is needed to investigate links between specific instructional practices and shifts in students' LTR achievement, our case study analyses suggest that the instructional changes made were effective in supporting students' LTR engagement in the specific areas targeted by teachers based on situated literacy assessment data.

Professional Development as Engaging Teachers in Cycles of Reflective Inquiry

Did engaging teachers in cycles of reflective inquiry foster their professional development? One of our main findings here was that, although all teachers were engaged in a year-long, instructional change cycle bookmarked by reviews of situated, formative (Fall) and summative (Spring) assessments, not all teachers engaged as recursively in cycles of inquiry during the school year (see Figure 1). For example, both Alex and Wanda made targeted changes to practice based on Fall assessment data and observed positive outcomes in targeted areas. But neither could describe in much detail how they engaged reflectively in planning, monitoring, or revising practice during the year. Not surprisingly, by the end of the year, neither perceived themselves as having made fundamental shifts in their thinking about teaching or in their instruction.

In contrast, both Lisa and Nancy described in detail ways in which they had engaged recursively in cycles of instructional change. Nancy continually monitored student progress and recalibrated her instruction accordingly. For example, during the year she noticed that her students were not internalizing the strategies she was teaching. So she considered whether she was teaching too many strategies at once: “It seems like a lot of really strong reading strategies were happening (being taught) all at once and they were” (lines 202 to 204). So, while she maintained commitment to her multiple goals, she refocused her efforts to highlight just one cognitive strategy at a time. Nancy also continually described shifts in her understandings about teaching and learning as she reflected on her practice in relation to outcomes for students (field notes, Mar 11/05; Jun 9/05; Jun 17/05; Jun 27/05).

Lisa also engaged recursively in cycles of planning, enacting, monitoring, and revising. In the end, she felt that she had made a significant shift in her teaching, moving from being content driven to basing her instruction on process/strategy goals (field notes, Jun 17/05; Jun 28/05). Lisa also described herself as more consciously strategic. She felt better able to build from assessment data to reflect on what she was doing in the classroom. She suggested that the most productive shift she made was in her planning. She found that revisions to her lesson format allowed her to better gauge her students' knowledge, skills and attitudes and adjust her instruction accordingly (field notes, May 19/05; Jun 28/05).

Our findings suggest that teachers’ professional development, defined as the depth and scope of shifts in thinking about teaching as linked to shifts in practice, could be associated, not with years of prior teaching experience, but rather with the level of teachers’ engagement in recursive cycles of collaborative inquiry as situated in authentic practice (Guskey, 2002; Langer, Colton, & Goff, 2003; Little et al., 2003; Luna et al., 2004; Morrell, 2004). Wanda and Alex,

who gained the least, were both reluctant to engage with colleagues or students in inquiry cycles (e.g., to work towards common goals with colleagues; to share data with students). Daphne and George engaged with colleagues to some extent in goal setting and planning. The teachers who made the greatest gains, Lisa and Nancy, seemed most comfortable co-regulating practice with colleagues and students. These latter teachers were not necessarily more successful at implementing a new instructional approach on the first try (see Nancy's struggles as described above). But they persisted despite obstacles and were most likely to access resources (e.g., researchers; colleagues; literature) for new ideas about how to achieve literacy goals.

In spite of variations across teachers, there were certain common benefits that accrued as a result of teachers' participating in the project. One common benefit was that providing formative assessment data that targeted the full range of processes associated with LTR (i.e., motivation, emotions, cognition, self-regulation, and comprehension/learning) focused teachers' attention on instructional goals they had previously overlooked. For example, like Lisa, most teachers commented on the shift they were making from a focus on content instruction alone to including attention to reading and thinking strategies. Further, all teachers explained how situated assessment data allowed them to target students' needs more effectively (see Table 2, row 1). Taken together, these findings suggest that teachers were building from an expanded understanding of LTR to shape instructional decisions, and that formative assessments shaped practice by defining new and important targets for instruction.

Similarly, all teachers drew productively on summative assessment data to reflect back on the year, analyze the progress they had made, and set pedagogical goals for the coming year (see Table 2, rows 6 & 7). Not only did summative data support monitoring of outcomes, but teachers' review of data also motivated sustained engagement in instructional change. We

suggest that this positive outcome arose because our summative assessments were directly linked to local goals and plans generated and enacted by teachers, and because they were positioned within a complete instructional change cycle initiated earlier in the year.

In sum, our findings suggest that engaging teachers in reflective inquiry cycles informed by assessment data supports professional development and meaningful revisions to practice. Formative assessments focused teachers' attention on new instructional goals, highlighted previously unrecognized student needs, and fostered revisions to teaching. Providing outcome data encouraged systematic monitoring of outcomes in relation to instruction and fueled further goal setting and planning. These findings are significant given the goal of professional development to foster meaningful changes in practice that can be linked to student outcomes (Borko, 2004; Hill, 2000; Joyce & Showers, 2002; Langer et al., 2003; Little et al., 2003; Rogers et. el., 2006), and of accountability frameworks wherein the hope is that assessments will energize productive instructional change.

Situated Assessment Data within Layered Accountability Frameworks

The research described here focused primarily on understanding how engaging teachers in developing and building from situated literacy assessments might promote their professional development. At the same time, we recognized our project's situation within a broader socio-political context. In this section, we describe what we have learned about how situated assessment strategies can provide formative and summative data useful for monitoring *and* accounting for student achievement. As we describe below, our findings suggest that (1) our data were seen by our case study teachers to be useful for monitoring outcomes at the classroom-, grade-, and school-levels; (2) our situated data were used by teachers, schools, and the district to formulate goals and monitoring outcomes more specific than those they were deriving from

large-scale assessments; and (3) our situated data were being used in accounting for outcomes at multiple levels. We also document how the district we worked with explicitly associated teachers' engagement in assessment fueled cycles of inquiry with their professional development and district-level professional development initiatives.

More specifically, our first finding was that our participating teachers viewed situated assessment data as useful, not only for informing practice, but also for monitoring outcomes at the classroom-, program-, and school-levels. For example, George referred to his classroom data as "school data" and described the importance of comparing student data from year to year to track the school's progress and to identify groups of students who might need more support (line 713). Similarly, Daphne, the professional development chair at the school, shared PBA and LRTQ data with entire school staff to examine grade-wide and cross-grade trends. This led to the introduction of classroom strategies as examples of practices that would assist teachers in achieving school literacy goals. Thus, teachers in our case study school extended use of situated data to identifying and monitoring grade-and school-level outcomes.

Second, our participating teachers were able to draw on situated data as a complement to provincial assessments to specify literacy goals and account for more nuanced outcomes. Prior to the introduction of situated assessments, teachers, schools and the district set goals based on provincial assessment data (i.e., improving reading comprehension for grade 10 students). But our participants perceived these large-scale assessments to be minimally relevant to instructional decision-making, because they were neither developed by the teachers nor fed back for use with students in the contexts where the assessments were completed. In contrast, our participants suggested that feeding situated assessments into year-long cycles of inquiry enabled them to create an accountability cycle more relevant to daily decisions. Further, because the LTRQ and

PBA targeted a range of LTR components (i.e., motivational, emotional, cognitive, self-regulation, comprehension/learning), teachers were able to identify more differentiated and multidimensional literacy needs. This benefit was also recognized in school- and district-level accountability plans for the following year (date; date), which encouraged school teams to analyze formative data to select three, specific grade-wide goals for students.

Third, over the past three years, we have observed data from our assessments being drawn into accountability cycles at district and Ministry levels. Within the school district, situated data have been built into accountability plans and proposals for literacy-specific provincial funds by all four schools within our larger project and by the district as a whole. For example, the district's funding proposal (December 2004) and its accountability plan for the subsequent school year (May 2005) incorporated funding for teachers to take part in the creation, scoring and analysis of the LTRQ and PBA formative assessments. A comparison of school and district accountability plans generated across three school years (May 2003; May 2004; December, 2004; February, 2005; May/June 2005) suggested increased attention to Fall-to-Spring cycles of data-supported goal setting and reflection. At the provincial level, our situated assessments were recognized by the BC Ministry of Education as acceptable tools for monitoring progress and accounting for outcomes. In fact, the Ministry contacted school board officials to commend them on the quality of their proposal (field notes), and a member of the Ministry accountability team ask to meet with the research team to learn more about the project. School district staff have been invited to speak at Ministry-sponsored events to share how the district is fostering cycles of inquiry to achieve literacy goals and incorporated PBA and LTRQ data into reports on outcomes.

Our final finding was that our participating district explicitly linked collection of situated data to teachers' professional development. For example, in the Fall, district level consultants

built from formative assessment data to set in motion a set of workshops. The district also planned and implemented an adolescent reading initiative based on formative and summative findings (evidenced in documents submitted to the Ministry in December 2004, May 2005 and May 2006). This initiative required schools to form literacy teams to examine their schools' capacity to: (1) collect and analyze classroom-based formative assessment data, (2) set and enact grade-wide instructional goals, and (3) monitor and account for progress. Each school was asked to write a funding proposal for the 2005-06 school year that included professional development goals and activities based on the needs of their students *and* teachers. To support schools in constructing proposals, district consultants developed a professional development plan that recognized the starting capacities of various schools (May/June 2005). Thus, district and school plans cast assessment and planning activities, not only as a strategy for increasing student achievement, but also as professional development opportunities that would assist teachers in reconsidering assessment and instructional practices (May 2004; December 2004; May 2005).

Conclusions

Most of our attention in this article has focused on linking teachers' engagement in inquiry cycles to professional development processes. Given that teachers are the decision-makers responsible for day-to-day practice, we were centrally concerned with how situated data might support teacher learning and meaningful change in classrooms. Our findings suggest that teachers can make situated changes that foster student achievement when they: (1) engage in the (co)construction and implementation of situated assessment practices; (2) set, tailor, and monitor context-specific goals for students and themselves; (3) have opportunities to work collaboratively and recursively through instructional change cycles; and (4) are engaged as partners in accountability cycles that incorporate local assessment data.

Our findings suggest that our "assess-goal set-plan-enact-monitor-assess" professional development structure focused teachers on the needs of their students in relation to an expanded set of instructional goals and supported them to make new and responsive instructional decisions. This conclusion is consistent with results reported by others also investigating teacher professional development in relation to instructional change (Black & Wiliam, 1998b; Borko, 2004; Earl, 1999; Guskey, 2002; Hill, 2003; Little et al, 2004; Stiggins, 2002; Timperley & Parr, 2003). However, we extend previous research by examining how professional development can be structured to allow for collaborative co-construction of context-sensitive innovations by individuals or teams of teachers. Indeed, in our study we observed that the six teachers followed unique, sometimes circuitous, paths as they engaged in cycles of inquiry and action.

While we draw the aforementioned conclusions, there are limitations to this study. Clearly further research is needed to examine the wider applicability of our conclusions, given that only 6 teachers from one school participated in this study. Further, in this phase of our research we examined the benefits of integrating formative assessment practices into instructional-change cycles, but we did not systematically document teacher learning processes or shifts in teachers' knowledge, beliefs, or conceptions as a result of engaging in collaborative inquiry, as we have done in previous investigations (Butler, 2005; Butler et al., 2004). We are currently engaged in a study that traces changes in teacher learning as associated with engagement in collaborative inquiry.

Additional research is also needed on the qualities of instructional change that might best effect desirable student outcomes, in this case promoting student SRL. We do offer limited data here relating instructional revisions to the kinds of benefits observed for students. Reflection on the patterns observed in this study suggests that, while each teacher's instructional response(s)

were well matched to the goals they set, few teachers created an integrated instructional plan that would address the complexity of student performance (i.e., taking into account motivation, emotion, cognition, and metacognition in LTR). For example, Alex attended to his students' affect (Paris, Byrnes & Paris, 2001), but did not focus on his students' cognitive or metacognitive strategy use. George and Daphne focused on cognitive strategies (Allington, 2001; Duke & Pearson, 2002; Ivey & Fisher, 2006; Tovani, 2004) but did little to foster self-regulation. They made efforts to address key, targeted literacy processes over time (Wilhelm, 2001; Wilhelm, Baker & Dube, 2001) and engaged in explicit, strategy-based instruction (Harris & Graham, 1999), but did not ultimately transfer responsibility for learning processes to students (Fielding and Pearson, 1994; Smith & Wilhelm, 2006). In contrast, the teachers who observed the most gains for students (Lisa and Nancy) constructed more complete instructional plans that fostered a fuller range of self-regulating processes (motivation, cognition, and metacognition). However, additional research is needed to more systematically study how instructional changes might be linked to student outcomes, and to consider how best to support teachers and inquiry groups to adopt more effective instructional changes.

Another area for further research is how to account for different patterns of engagement in inquiry by different teachers. While all teachers could articulate how assessment data led them to new insights about the learning profile(s) within their class(es), each struggled at some point during our professional development cycle. Why were some teachers more successful than others in engaging in cycles of inquiry and sustaining instructional change? We suspect that the reasons are complex, reflecting interactions between the conceptions, knowledge, and beliefs of teachers, both at the start of the project and as they evolved over time, the contexts in which they were working (e.g., interpersonal dynamics; time available for reflection), and the way in which new

innovations were enacted (e.g., with students as partners or more teacher-centered). We can offer that, when asked what would be the most valuable "next steps," our 6 study participants requested (1) more time to work together and share practices and (2) continued opportunities to engage in data-supported, collaborative planning and reflection. But more research is needed on factors associated with successful engagement and on what kinds of situated support might be most helpful for teachers seeking to make instructional change (Butler, 2005; Butler et al., 2004).

More generally, the research reported here focused on a central concern to most stakeholders in education in the current socio-political context, namely how data might be used to inform educational practice, spur educational innovation, and enhance student achievement. In this article we have proffered an integrative model that inserts situated assessment data as an energizer into cycles of collaborative inquiry, links student and teacher learning to engagement in inquiry cycles, and proposes constructing accountability frameworks by establishing nested cycles of collaborative inquiry overlapping at multiple levels (i.e,. in and across classrooms, teacher inquiry groups, schools, a school district) (see Figure 2). As our project evolved, we perceived possibilities for government, districts, schools, teachers, and parents to set in motion inquiry processes that stimulate instructional revision, such as government or district calls for data-driven accountability cycles that allow for localized definition of goals and monitoring strategies, or financial incentives to launch multi-level cycles of inquiry focused in particular directions (e.g., on adolescent literacy). Our findings suggest the power of inquiry cycles to fuel innovation at the classroom (i.e., by students and teachers), school (i.e., by school teams), district (e.g., in accountability plans), and Ministry levels.

While our findings suggest that it is possible to establish accountability cycles that are both participatory and meaningful to stakeholders at multiple levels, important questions remain as to

whether and how teachers, schools and school districts might influence accountability requirements of governments, and about whether and how policies designed to promote educational change can be constructed to take into account multiple stakeholder perspectives. Additional research is clearly needed to investigate links between accountability policies, on-the-ground practices, teacher agency, and professional development. Nonetheless, based on our findings so far, we conclude that inserting situated assessment strategies into multilayered cycles of inquiry can support a (re)conceptualization of accountability agendas so as to spur productive revisions to practice, and that engaging teachers in co-constructing and interpreting situated assessments impels them to act as agents of change in classrooms and schools. We contend that teachers, administrators, and policy makers can and should share the common goal of initiating and sustaining cycles of inquiry incorporating careful review of situated assessment data, not only to aid in accounting for outcomes, but also to motivate and guide instructional revision (Robertson, Hill, & Earl, 2004; Shepard, 2000; Stiggins, 2002).

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Table and Figure Captions

Table 1

Grade Level	Subject Area	# of Students	Academy	Teacher(s)
Grade 7	Science	16	Science Academy	George
Grade 7	Science	21	Fine Arts Academy	Nancy
Grade 8	Humanities	26	Science Academy	Daphne
Grade 8	Humanities	39	Fine Arts Academy	Alex
Grade 9	Humanities	23	Science Academy	Wanda
Grade 9	Humanities	25	Fine Arts Academy	Lisa
TOTAL		150		

Table 2

Row #	Themes	Nancy	Wanda	George	Lisa	Daphne	Alex
1	Formative assessment	69-71 77-82 97-101 131-155 335-338 537-539	37-40 82-86 488-491 806-812	172-179 186-192 235-242 279-280 372-382	33-39 90-91 95-97 304-308	54-61 371-374 375-380 444-456 506-513	86-98 155-159
2	Goal setting	112-115 121-123 137-140	428-430	237-248 686-689	90-92 124-125 304-308 363-364 469-477	139-140 471-474 623-630	165-169 338-342
3	Description of strategy enactment/ Changing instructional practices	61-63 78-82 121-123 131-140 161-170 234-237 299-311 345-353 556-562 714-723 725-737 840-844	40-42 232-236 261-262 560-563 608-612	111-114 267-268 571-581 613-621	90-97 124-130 136-142 156-160 197-200 292-293	61-74 95-102 105-112 315-329	144-153 182-197 202-206 276-186 313-328 338-347 359-368 383-387
4	Enactment of Strategy(s)/ Detailed description of implementation	161-170 175-248 254-255 258-286 288-297 299-311 313-318 345-353 616-621 725-731 840-844	241-253 267-281 318-322	111-145 155-170 196-217 396-413 437-444 451-465 469-472 517-542	165-195 206-220 223-245 254-264 270-285 301-308 310-321 327-364 366-385	66-69 444-456 589-598	182-197 199-211 220-225 291-292 313-328 416-417 442-452 457-463

Table continues …

Table 2 continued

Row #	Themes	Nancy	Wanda	George	Lisa	Daphne	Alex
5	Emotional reaction/response	58-63 66-69 79-82 97-101 136-140 327-334 341-345 528-533 537-539 550-552	33-40 448-449 488-449 488-491 501-506 691-693 713-718	9-12 31-31 206-207 497-504 569-571 588-588	33-34 102-106 115-116 398-403 492-499 503-505	110-113 212-214 216-217 243-244 300-303 329-335 366-369 375-380 444-456 469-471 541-542 548-551 508-509 71-704	
6	Next steps: Pedagogical goals	338-341 161-162 600-602 618-621 679-681	358-376 747-749 815-820	605-611 621-630 686-689	243-245	125-130 329-335 491-494 761-765 318-321	551-559 597-609 624-626
7	Next steps: Future goals for students	148-151 338-341 616-618 672-681		613-621 621-630	243-245	318-321 371-374 640-645 728-740 761-765	242-245 551-559

Table 3

Patterns emphasized when viewing data sources (LRTQ, PBA)	Goals set for students	Teaching Strategies enacted and monitored	Shifts in Lisa's practice (cut across time and activities)	Perceptions of student gains (interview)	Gains reflected in student data
Lisa noted students: • were surprisingly confident (LTRQ) • "did not seem to know what LTR was all about" (LTRQ) • did not see LTR tasks as requiring much planning (LTRQ) • struggled to draw inferences (PBA) • made very few connections and did not elaborate on them (PBA) • had difficulty finding main, big ideas in text(PBA) • reported minimal strategy use (LTRQ/PBA)	Common goals: • draw inferences • make connections • determine importance Unique goals: • set goals • be aware of planning • use text features • use strategies across subjects	Lisa taught students to: • set a goal before reading • use planning methods • choose strategies • create reading logs using criteria • make connections • find main ideas and details • chunk text • reflect as part of every lesson (e.g., what did I learn? what do I need to focus on next time?)	Lisa identified the following practices: • modeling • think alouds • chunking text • multimodal presentation and solicitation of ideas, responses, & understandings • using a before, during, & after lesson format • decreasing teacher talk, increasing partner talk • consistently accessing students' prior knowledge • spending extended time on a reading/ thinking strategy (i.e., half the year)	Lisa reported that students: • know how to make a plan for extended LTR tasks • know how to select or create a strategy • know how to find main ideas and details • know how to find links between information • perceive reading as an active process	Lisa observed gains in: • task interpretation (LTRQ) • making a plan (LTRQ) • focusing on methods (LTRQ) • reported use of text features (LTRQ) • attention to important ideas or themes (LTRQ/PBA) • finding links between information (LTRQ) • report of relevant performance criteria (LTRQ) ability to… • determine importance (PBA)

Figure 1

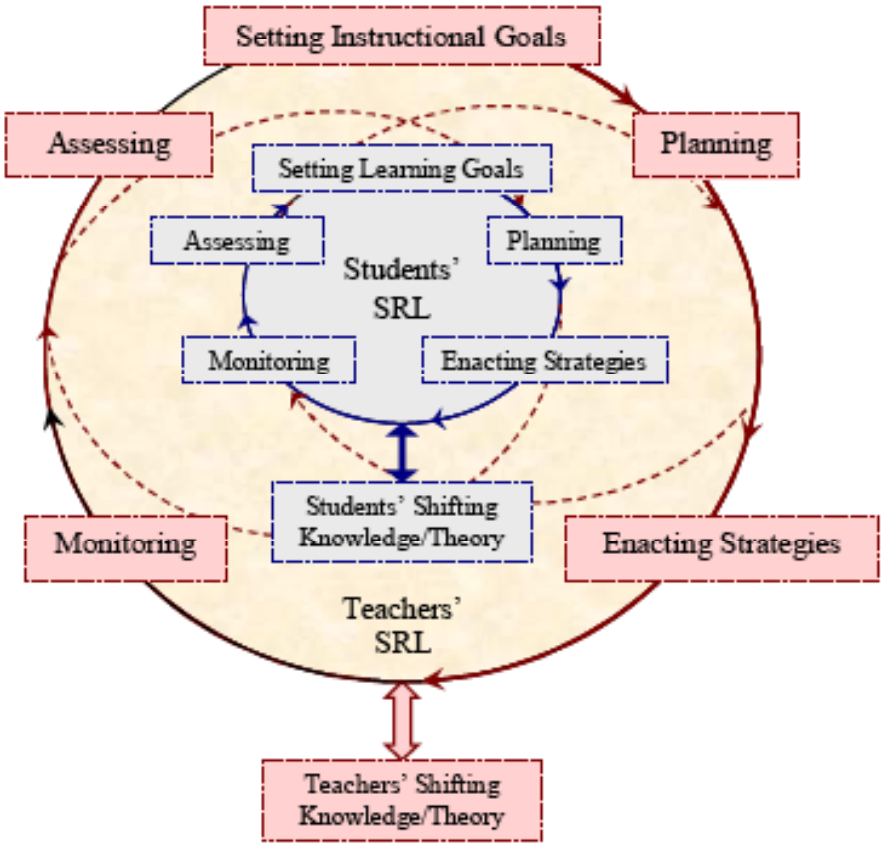

Setting Instructional Goals
Assessing
Planning
Setting Learning Goals
Assessing
Planning
Students' SRL
Monitoring
Enacting Strategies
Students' Shifting Knowledge/Theory
Monitoring
Enacting Strategies
Teachers' SRL
Teachers' Shifting Knowledge/Theory

Figure 2

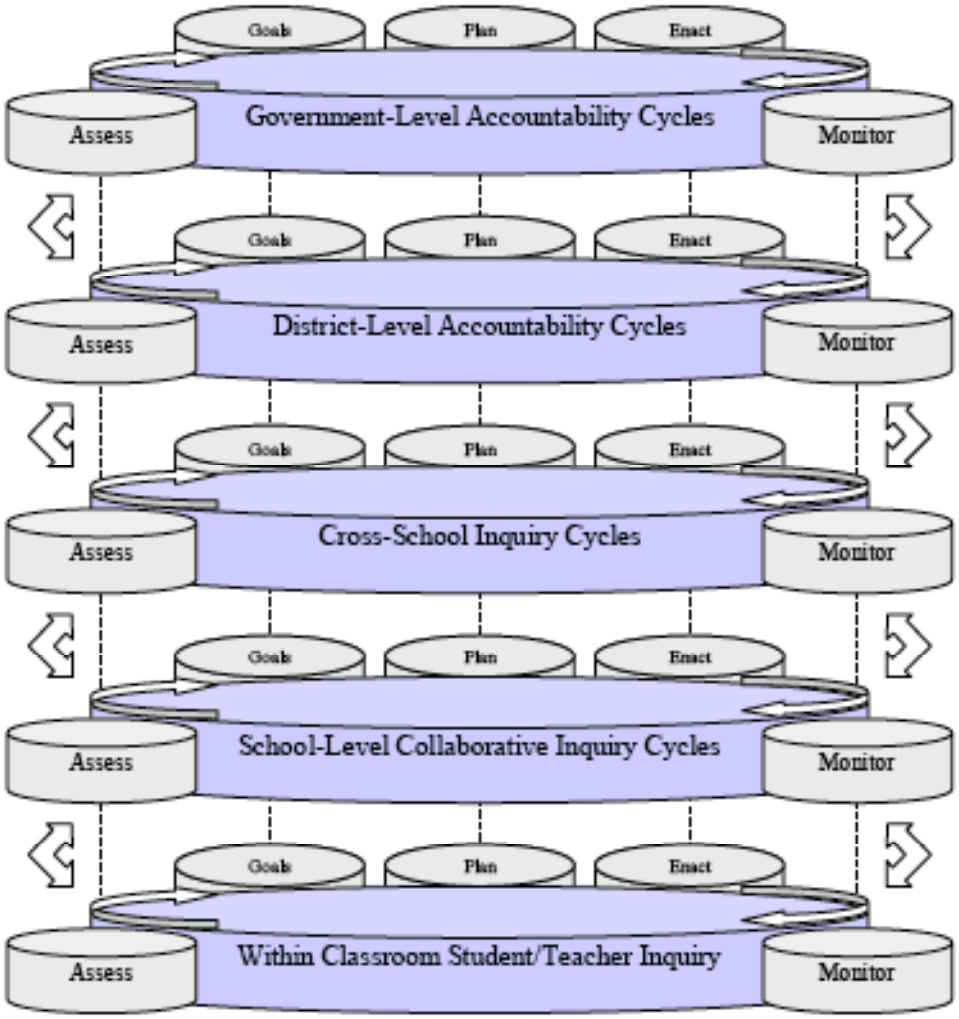
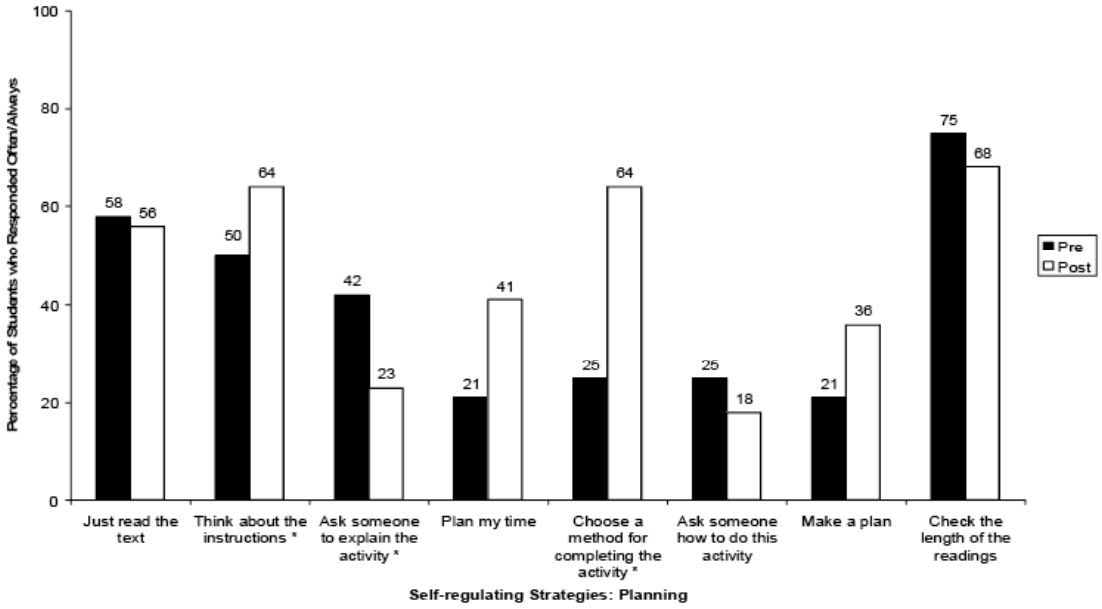
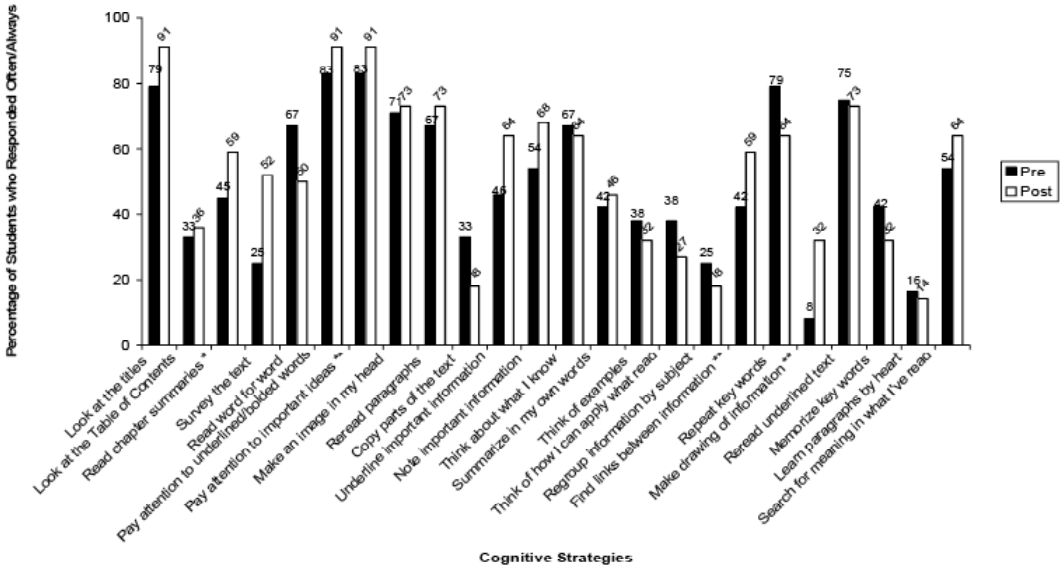

Goals
Plan
Enact
Assess
Government-Level Accountability Cycles
Monitor
Goals
Plan
Enact
Assess
District-Level Accountability Cycles
Monitor
Goals
Plan
Enact
Assess
Cross-School Inquiry Cycles
Monitor
Goals
Plan
Enact
Assess
School-Level Collaborative Inquiry Cycles
Monitor
Goals
Plan
Enact
Assess
Within Classroom Student/Teacher Inquiry
Monitor

Figure 3a



Note: This chart is presented as an artifact from Lisa's classroom, showing what she viewed as outcomes for her students. Data analyses for students, however, included only those students for whom consent was available (a subset of the class).
* All *p's* < .05; *Think about the instructions*, F (1, 22) = 6.60, *eta* = .24; *Ask someone to explain the activity*, F (1, 22) = 4.92, *eta* = .19; *Choose a method*..., F (1, 22) = 6.18, *eta* = .23.

Figure 3b



Note: This chart is presented as an artifact from Lisa's classroom, showing what she viewed as outcomes for her students. Data analyses for students, however, included only those students for whom consent was available (a subset of the class).

Note. * $p < .05$; ** $p < .01$; *Read chapter summaries*, $F(1, 22) = 4.91$, *eta* = .19; *Pay attention to important ideas*, $F(1, 22) = 14.54$, *eta-square* = .41; *Find links ...*, $F(1, 22) = 8.56$, *eta* = .29; *Make a drawing ...*, $F(1, 22) = 10.53$, *eta* = .33.

Figure 4

Teacher 1: "Nancy" Fine Arts Academy

- Teaching 5 years, previously taught intermediate (grades 4-7) and learning support
- Second year at this school and teaching secondary students
- Teaches Social Studies 7, Science 7, Math 7, Language Arts 7 & Learning Support 7/8

Teacher 2: "Wanda" Science Academy

- Teaching 20 years, grades 9-12 background
- Second year at this school
- Teacher Librarian and teaches Humanities 9 and 10

Teacher 3: "George" Science Academy

- Teaching 25+ years, grades 4-7 background
- Second year at school and secondary
- Teaches Science and Math 7/8 and Environmental Science 8

Teacher 4: "Lisa" Fine Arts Academy

- Teaching 20+ years, grades 8-12 background
- Second year at school
- Teaches Drama 7-9 and Humanities 9

Teacher 5: "Daphne" Science Academy

- Teaching 10 years, grades 8-12 learning resource and English background
- First year at this school
- Teaches Humanities 8 and 9

Teacher 6: "Alex" Fine Arts Academy

- Teaching 25+ years, grades 8-12
- First year at school
- Teaches Music 7-9 and Humanities 8

Figure 5

June to early September	September		October	November-March	May		June	
Preparing assessments	Assessment for learning: Formative	Group scoring of PBA	Reviewing LTRQ data	Individual Planning and debriefing	Assessment of learning: Summative	Group scoring of PBA	Reviewing LTRQ data	Interviews
Meetings to generate PBA and select a text for each grade 2 x 60 minutes Review of protocols for LTRQ & PBA 60 minutes	<u>Day 1</u> LTRQ administered by teachers 60 minutes Researcher available to model/ troubleshoot <u>Day 2</u> PBA administered by teachers 60 minutes	Training for calibration 45 minutes Collaborative scoring with two teachers / classes of 30 students 3 hours Team debrief to look for patterns and set personal and grade-wide goals (all six teachers plus four others) 90 minutes	Overview of components and report structure 10 minutes Team examination of grade and class level results 45 minutes	<u>George</u> • co-plans and hosts demonstration lesson for other teachers 1 time <u>Daphne</u> • co-plans with researcher & Nancy 1 time • demonstration lesson from researcher 1 time <u>Nancy</u> • co-plans & co-teaches with researcher 2 times • co-plans with researcher & Daphne 1 time <u>Lisa</u> • co-plans with researcher 4 times • demonstration lesson from researcher 1 time • co-teaches with researcher 3 times	<u>Day 1</u> LTRQ administered by teachers 60 minutes <u>Day 2</u> PBA administered by teachers 60 minutes	Training for calibration 45 minutes Collaborative scoring with two teachers / classes of 30 students 3 hours Team debrief to look for patterns, discuss revisions to tools and process for next year (all six teachers plus four others) 90 minutes	Overview of components and report structure 10 minutes Team examination of grade and class level results 45 minutes	Each teacher sits for a 40 minute interview