

Self-Regulation and Collaborative Learning
in Teachers' Professional Development

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Abstract

This paper examines the interplay between self-regulation and collaborative learning processes in teachers' professional development. To begin, a theoretical framework is established for defining self-regulated learning by teachers as situated in practice and within collaborative learning communities. The focus in this theoretical analysis is on identifying the interface between individual and collaborative learning processes. This discussion sets the stage for describing two consecutive professional development initiatives and teachers' learning within those contexts. An overview of the two projects is provided, along with a reporting of findings focused on *how* teachers came to make shifts in practice through participating in collaborative research with teams of fellow teachers and researchers.

Self-Regulation and Collaborative Learning in Teachers' Professional Development

Many emerging models for teacher professional development engage teachers in collaborative inquiry as a means for spurring professional growth, and correspondingly, meaningful shifts in practice (e.g., Butler, in press; Collins, 1998; Palincsar, 1999; Perry, Walton, & Calder, 1999; Scott & Weeks, 1996; Simmons et al., 2000; Stein, Schwan Smith & Silver., 1999). Within these collaborative models, learning communities are established wherein teachers discuss theoretical principles, generate instructional strategies, try out ideas in their classrooms, reflect on outcomes, share insights about what they are learning, and, through this dynamic process, co-construct knowledge about teaching and learning within the context of authentic activity (e.g., Borko & Putnam, 1998; Perry et al., 1999). However, although positive outcomes have been associated with teachers' participation in collaborative inquiry, disagreement exists regarding the nature of teacher learning in these collaborative contexts (Cole, 1991; Damon, 1991; Lave, 1991; Moore & Rocklin, 1998; Stein et al., 1999). At one end of a continuum are researchers who focus narrowly on individuals' "in-the-head" learning as if it can be abstracted from context. At the other end of the continuum are models that emphasize sociocultural processes and characterize learning as socially-mediated and context-bound.

In this paper, I argue that understanding teacher learning requires bridging across these individualistic and social-practice perspectives without oversimplifying the contribution of either (Butler, in press). To build that argument, I begin by presenting a theoretical framework for understanding teachers' self-regulated learning as situated in practice and as enacted within collaborative learning communities. Then, to illustrate the benefits of adopting an integrative perspective, I overview findings from two consecutive professional development projects wherein I examined individual and collective learning in the context of learning communities. I close by discussing implications for structuring professional development initiatives.

Assumptions about Teaching and Professional Development

Collaborative professional development models are founded on conceptions of teaching as a process requiring complex, contextualized decision making (Ball, 1995; Palincsar, 1999; Palincsar, Magnussen, Marano, Ford, & Brown, 1998). As a result, the goal in professional development initiatives is to assist teachers in constructing conceptual knowledge about teaching on which decisions can be founded, rather than focusing restrictively on the development of procedural skills (Gersten et al., 1997). This position runs contrary to commonly observed approaches to professional development that focus on conveying specific instructional strategies to teachers, without sufficient attention to the conceptual frameworks underlying recommended practices (Gersten, 1995; Englert & Tarrant, 1999).

But if the ultimate goal is to support teachers' (re)construction of professional knowledge, careful attention must be paid to how links can be forged between theory and practice. For example, imagine for a moment that a group of teachers comes together to learn about "best practices" that they wish to apply within their classrooms. The challenge for teachers in this kind of project is to situate new theoretical principles into practice in a deep-rooted way that actually shapes their decision-making in context (in contrast to a more shallow implementation) (Gersten, 1995). Unfortunately, much evidence attests to the challenge teachers experience translating "theory into practice" (e.g., Schumm & Vaughn, 1995). But imagine for a moment a different project, in which teachers embark on action research projects that are grounded in problems observed in practice. Even from this point of departure, the

teachers will be challenged to articulate knowledge constructed from their own experiences with theoretical frameworks generated by others (e.g., peers in a study group; in prior research). In both of the two scenarios above, professional development requires teachers to coordinate existing conceptual frameworks with knowledge grounded in teaching (Bromme & Tillema, 1995).

Several implications can be derived from this initial discussion for teachers' professional development. One is that supporting meaningful revisions to teaching requires attention to how teachers construct knowledge and beliefs that underlie decision-making *in situ*. Second, teachers' revisions to practice will require opportunities to reflect on and find connections between theory and practice, whatever the point of departure. In most emerging collaborative models, this is accomplished by establishing a dynamic interplay between teachers' thinking about theory, deriving implications for practice, situating new approaches in their classrooms, reflecting on outcomes, and refining and/or (re)constructing knowledge based on emerging experience. A third implication, following from the second, is that professional development must somehow be connected to authentic practice. A fourth implication is that professional development requires *time*, for teachers to try out, reflect on, and revise approaches to teaching. A fifth implication is that understanding teachers' professional development requires understanding how revisions to practice and/or conceptual knowledge are mutually supportive. And, finally, as an extension of this last point, understanding teacher learning within a *collaborative* context requires explaining how collective and individual learning processes co-operate to shape teachers' construction of knowledge and revisions to practice.

Self-Regulated Learning and Professional Development

Much research has focused on how effective students in classrooms self-regulate learning to successfully accomplish academic work (Butler & Winne, 1995; Harris & Graham, 1996; Zimmerman, 1994; Zimmerman & Schunk, 2001). In this paper, I argue that much can be drawn from those models of self-regulated learning to understand teachers' learning processes within collaborative professional development (see also Butler, in press; Kremer-Hayon & Tillema, 1999). This is because models of self-regulated learning focus attention on individual learning as it plays out in context. As Zimmerman and Schunk (2001) note, in spite of the apparent focus on *self*-regulated learning, these models are also inherently situated in that they describe how individuals strategically adapt within environments to achieve authentic goals. Further, as is evidenced by Vygotsky's discussions on the development of self-regulation, models of self-regulated learning are clearly coherent with sociocultural perspectives on learning (e.g., Vygotsky, 1978). Thus, it is possible that models of self-regulated learning provide a framework within which individual and sociocultural learning processes can be understood.

To aid in connecting a model of self-regulated learning to collaborative professional development, Figure 1 presents an overview of self-regulated processes typically associated with student learning. First, notice that self-regulated learning transpires within a given historical, social, and instructional context (the latter encompassing the tasks assigned, the nature of instruction, evaluation practices, etc.) (Butler & Cartier, in press). When confronted with academic work in a given context, learners interpret demands in light of prior knowledge and beliefs (about a given topic, learning, themselves as learners, academic work, tasks, and strategies). Indeed, research suggests that students' reactions within classroom environments are more a function of their *perceptions* of classroom conditions than of the actual conditions themselves (Linnenbrink & Pintrich, 2001).

Once presented with a given task (in context), self-regulated learners interpret task demands and set goals for learning (which may or may not actually focus on academic achievement) (Linnenbrink & Pintrich, 2001). Even for focused learners, task interpretation is a pivotal step in self-regulation, because all further learning activities are based on students' perceptions of what they are trying to achieve (Butler & Winne, 1995). Also, once students have a clear purpose, they can be engaged in developing strategies related to their goals (Butler, 1995; 1998-a; 1998-c). Indeed, based on their perceptions of what they are trying to accomplish, learners select, adapt, or even invent strategies to achieve their objectives. They enact their strategies and reflect on the success of their efforts. Monitoring outcomes is another key step in self-regulated learning, because at this stage learners generate judgments (i.e., feedback to themselves) related to how well they are meeting their goals (Butler & Winne, 1995). Self-regulated learners then re-direct learning activities based on progress perceived. Finally, self-regulated learners manage not only their learning activities, but also environments, resources, emotions, and motivation to help them accomplish objectives (Corno, 1993; 1994; Pintrich, 2000; Zimmerman & Schunk, 2001).

Parallel to this description of students' learning processes, collaborative professional development projects engage teachers (and sometimes researchers) in joint inquiry about teaching as a means of shifting practice (e.g., Borko et al., 1997; Boudah et al., 2001; Briscoe & Peters, 1997; Englert & Tarrant, 1995; Hunsaker & Johnston, 1992; Palincsar et al., 1998; Perry et al., 1999; Rennie, 2001; Stein et al., 1999). Within that context, teachers are supported to identify common goals, based on a combination of theoretical principles and/or on-going reflections on practice. Then, individually or together, they construct instructional strategies based on goals, enact plans in practice, and monitor outcomes. Teachers usually come together at regular intervals to review their instruction, talk about progress, and critically reflect on their teaching (Ball, 1995; Englert & Tarrant, 1995). Through this process, teachers come to develop a shared language for referring to concepts and co-construct knowledge about teaching (Bos, 1995; Englert & Tarrant, 1995).

Based on this characterization, it is possible to argue that teachers' self-regulation in collaborative inquiry encompasses strategic performance at two levels simultaneously. First, teachers can be thought of as self-regulating their *learning about teaching*. Through cycles of self-regulated learning, teachers construct new knowledge and beliefs about teaching grounded in their coordination of theoretical frameworks and their reflection on teaching practices. But at the same time, teachers are learning to *self-regulate their teaching practices*. That is, based on specific goals for their students, teachers construct instructional strategies, enact them in their classrooms, monitor outcomes, and revise instruction accordingly. Thus, when professional development is situated in practice, teachers actively construct approaches to teaching (situated in context and mediated by knowledge and beliefs that ground decision making *in situ*). And, when their attention focuses on their own learning in that context (with opportunities for goal setting, active learning, reflection, and self-assessment), they simultaneously revise knowledge about learning and teaching that in turn influences teaching practice.

Several key points can be distilled from this description of self-regulated learning and the connection to teachers' professional development. The first is that self-regulated learning is mediated by theoretical frameworks. Just as is the case with students, teachers' learning about and approaches to teaching are predicated on their interpretations of contexts as mediated by extant knowledge and beliefs. The implication, again, is that promoting teachers' professional development requires attention to how knowledge and beliefs are constructed within collaborative learning environments. Second, self-regulated learning, and self-regulated teaching, are active and reflective activities (Butler, 1998-b). It follows that promoting self-reflective teaching and learning is an important goal within professional

development initiatives. Third, the way in which a teacher self-regulates learning (or teaching) is fundamentally dependent on their interpretation of *goals*. It follows that shaping teachers' professional practice requires attention to how they frame purposes underlying teaching and learning (their own; students' learning). Fourth, when teachers (or students) have clear visions of purposes, they can be actively engaged in constructing strategies for accomplishing goals (without necessarily directly teaching specific procedures) (Butler, 1995; 1998-a; 1998-c; Butler, in press). Indeed, previous research suggests that students are empowered when they recognize their competence in developing their own personalized strategies (Butler, 1995; 1998-a), and it may be that teachers would be similarly empowered if they observed their ability to problem-solving strategies to effect meaningful learning (by themselves; by their students). Finally, it could be argued that it is through engaging in the recursive cycle of problem-solving activities central to self-regulated learning that new knowledge and beliefs can emerge (Butler, 2003). Indeed, this is a powerful premise underlying professional development models that engage teachers in collaborative inquiry about teaching.

Self-Regulation and Social Practice

In this paper I am arguing that a model of self-regulated learning might be useful in understanding individual and collective learning processes within the context of authentic social practice. In this section, I focus specifically on the interface between situated practice, context, collaboration, and self-regulation in individual and collective learning. This discussion is grounded in an integration of theoretical mechanisms detailed across theories of self-regulated learning (e.g., Butler & Winne, 1995; Zimmerman, 1994; Zimmerman & Schunk, 2001), models of collaborative professional development (e.g., Butler, in press; Englert & Tarrant, 1995; Kremer-Hayon & Tillema, 1999; Perry et al., 1999), and situated and distributed theories of learning (Barab & Duffy, 2000; Brown, Collins, & Duguid, 1989; Lave & Wenger, 1991).

When describing collaborative professional development initiatives, researchers often explain collaborative processes in terms of a "communities of practice" (COP) framework, typically grounded in sociocultural, situated, and/or distributed theories of learning (Englert & Tarrant, 1995; Henry et al., 1999; Lave & Wenger, 1991; Palincsar et al., 1998; Perry et al., 1999). A major contribution of a COP framework is that it foregrounds the influence of history, society, culture, and community in shaping teacher learning. The emphasis is on how construction of conceptual knowledge is socially and culturally situated (Barab & Duffy, 2000; Brown et al., 1989). For example, societal values dictate what counts as teaching and learning. Similarly, the instructional contexts in which teachers find themselves delimit and define possible teaching practices. A key idea too is that knowledge is situated in context, in that it derives meaning from how it applies within socially- and culturally-defined activity. Finally, it is within context that teachers access language and cultural tools to interpret and make sense of experience (Butler, 1998-b; Stone, 1998). It follows that understanding even solo-learning requires an understanding of sociocultural influences on knowledge construction and use.

One key way in which context impacts on self-regulation, if considered in light of a COP framework (and situated or distributed theories of learning), is through exposure to authentic practice. One benefit of observing authentic practice is that doing so reveals the goals that members of learning communities need to attain (and even defines the identities they hope to assume, such as a particular kind of professional identity) (Lave & Wenger, 1991). An important implication is that, if self-regulation is fundamentally dependent on a perception of purposes, as was suggested above, then exposure to authentic practice is important for helping teachers understand the goals towards which they are striving.

Nonetheless, models of self-regulation would suggest that such an impact would be contingent on how individuals interpret goals (in light of theoretical frameworks and within a dynamic situation).

A second way in which exposure to authentic practice might impact on self-regulation is through clarification of how to complete certain activities. Indeed, most models of learning (e.g., behavioural, direct instruction, sociocultural, situated, distributed) posit that an ideal approach to promoting the development of strategies or skills by learners is through modeling by more experienced community members. But, although the value of examples of practice is undeniable, key questions remain concerning *how* modeling exerts an impact on self-regulation and knowledge construction. Although learners are often described as “internalizing” authentic practices observed in use by others, it is not always clear what internalization entails (Butler, 1998-b; 2003). What is required is clarification of how individuals interpret and draw from modeling when self-directing learning (individually or collectively), a topic revisited below.

Another contribution to understanding teacher learning within a COP framework that articulates well with a model of self-regulated learning derives from the explicit descriptions of how learning between and among teachers is grounded in reflection on action. A first implication is that, if during collaborative inquiry teachers make instructional decisions in light of theoretical frameworks and in pursuit of common goals, it follows that bridging the theory-practice divide might be promoted by supporting teachers’ decision-making *in situ*. A COP framework and models of self-regulation converge to suggest supporting teachers’ theoretically-grounded decision making coupled with reflections on that experience. Further, as is depicted in Figure 2, teachers might shape each others’ learning and decision-making within learning communities when they work collaboratively and share expertise in order to (1) make sense of new theoretical frameworks and interpret environmental demands, (2) define common goals, (3) select, adapt, or invent instructional strategies, (4) situate principles in practice, (5) make sense of outcomes, and (6) define implications derived from experience in light of emerging knowledge and beliefs. It is through this process of collective inquiry that teachers influence one another’s “transactional” construction of knowledge that is richer than knowledge any one teacher might construct on his/her own (Pressley et al., 1992).

A theme within the discussion in this (and the last) section is that teachers’ collaborative problem-solving and resultant learning is fundamentally mediated by theoretical frameworks. While learning is situated, and is shaped by the “language” and “cultural tools” available to make sense of experience, the impact of an environment on teachers’ professional development is nonetheless indirect. Teachers’ understanding of the contributions of peers is a function of the sense they make of those contributions. But, when individuals are mutually engaged in collaborative inquiry in pursuit of particular goals, they themselves become cultural tools that impact on how others interpret experience (Butler, 1998-b; Stone, 1998). And, to the extent that teachers establish a shared language for mapping onto experience, and establish shared frameworks for interpreting shared examples, then they shape each others’ co/re-construction of learning and each others’ approaches to teaching. Thus, returning to the question of the place of modeling in teachers’ professional development, it could be that modeling and/or examples influence learning and knowledge construction to the extent that they support teachers’ active self-regulation (e.g., defining goals, defining and trying out instructional strategies). But to have that effect, teachers must (individually or collectively) interpret the relevance of examples in light of theoretical frameworks and in relation to instructional goals.

It should be noted that, although self-regulated learning always transpires in a particular historically-, culturally-, and socially-situated context, teachers' professional development need not be enacted within a collaborative learning community. An individual teacher might choose to self-regulate his or her learning about teaching on his or her own. Nonetheless, it is important to remain cognizant of the extent to which sociocultural processes influence even solo-learning (e.g., by virtue of shaping the teachers' prior knowledge and beliefs, learners' reactions in the classroom, the instructional context, resources the teacher might draw on, etc.). Further, researchers are uncovering benefits that accrue from engaging teachers in collaborative inquiry. For example, when working with students, researchers have found that social interaction fosters students' development of more focused, self-regulated approaches to learning (Harris & Graham, 1996; Palincsar & Brown, 1988; Pressley et al., 1992). And again, through social interaction, learners construct conceptual knowledge that is richer than knowledge constructed alone (Pressley et al., 1992). Finally, working with others may foster more of a sustained commitment to challenging, long-term professional development projects (Butler, in press).

Structuring Collaborative Learning as Professional Development

Several principles for structuring collaborative professional development arise out of the theoretical framework developed within the preceding sections. A first recommendation is to explicitly focus on helping teachers coordinate theoretical frameworks with reflection on authentic practice. While this recommendation at first appears straightforward, there are multiple layers to what is required. For example, to forge new links between theoretical frameworks and practice, teachers must (1) become cognizant of existing assumptions, knowledge and beliefs that shape their instructional decisions, (2) interpret new theoretical frameworks in light of existing knowledge and beliefs, (3) situate new ideas in practice by drawing on revised conceptual knowledge to make different kinds of teaching decisions, and (4) revise or reframe existing knowledge based on reflection on teaching activity. It is only through this complex and cycling process that entails reflectively situating knowledge-in-use that teachers can (re)construct conceptual knowledge in order to make deep-rooted changes to practice. And, as if this enterprise were not difficult enough, another layer of complexity can be added by assisting teachers to surface the ways in which the theoretical frameworks they draw on to understand teaching and learning are historically, culturally, and socially situated (e.g., tied to cultural practices in education).

A second recommendation is to support teachers' self-regulated learning (and teaching) by engaging them in collaborative inquiry. This collective learning among teachers should focus on connecting theory to practice (as described above) and should be grounded in authentic activity. Within that context, teachers should be work collectively to define common goals, articulate possible instructional strategies and their relationship to theoretical principles and goals, enact new ideas in practice, monitor successes and challenges, and interpret outcomes so as to derive implications for theory and practice. Within learning communities, teachers can be supported to talk about, reflect on, and interpret theory in tandem with experience. By developing a shared language and shared frameworks for making sense of educational practice, teachers can support one another to re/co-construct new conceptual understandings.

A third recommendation is that, although it may be useful to present new theoretical frameworks to spur different ways of thinking about educational practice (e.g., in a workshop format), these kinds of activities must be paired with support to teachers to revise decision-making *in situ*. It is when teachers are actually faced with making different kinds of instructional decisions that they interpret the implications of theory and reshape educational practice. Further, the theoretical framework developed in

this paper suggests that any new information available to teachers (e.g., descriptions of theory, modeling, interactive discussions) will have impact only to the extent that the information serves as a resource (i.e., a cultural tool) for teachers embroiled in actually making decisions (i.e., in the process of collaborative problem-solving). Similarly, it is during collaborative inquiry when teachers can support one another to interpret and apply information to ground new approaches to teaching and learning.

Finally, it follows from the above three recommendations that meaningful professional development must be sustained. Teachers need ample time to experiment with ideas and reflect on revisions to practice if they are to truly shift the conceptual frameworks on which their approaches to teaching are founded.

The Secondary and Intermediate Projects

The remainder of this paper describes two consecutive, two-year collaborative professional development projects in which teacher learning was investigated. The common goal adopted by teachers in each project was to promote independent, strategic, self-regulated learning by students in secondary or intermediate classrooms, respectively. In each project, we gathered data to document how teachers made connections between this new theoretical framework, their existing knowledge and beliefs and situated practice. More specifically, participants in each of the projects were teachers who wanted to adapt the “Strategic Content Learning” (SCL) approach for promoting self-regulated learning (Butler, 1993; 1995). Much evidence existed at the time of our first project of SCL’s efficacy in promoting self-regulated learning by students at the postsecondary level (Butler, 1995; 1998-a; Butler, Elashuk, & Poole, 2000). However, little research existed on SCL applicability for students within secondary or intermediate classrooms. Thus, teachers in each of the projects described here had an interesting opportunity to work with researchers to define new ways to situate SCL instructional principles in their work with younger students.

Not surprisingly, the instructional principles underlying SCL, designed to promote self-regulated learning by students, paralleled the principles underlying our professional development model, focused on promoting self-regulated learning by teachers (as outlined above). In SCL, instructional principles include: (1) collaborating with students to engage in meaningful work (i.e., engage in authentic practice); (2) surfacing students’ existing knowledge and beliefs by listening carefully to students’ sense-making while engaged in tasks; (3) engaging students in collaborative problem-solving and the construction of personalized learning strategies while working towards well defined goals; (4) acting as a facilitator or coach to support effective decision making (and learning); (5) providing language in interactive discussions that students might employ to make sense of experience; and (6) asking students to articulate ideas (e.g., about task criteria, productive strategies) in their own words to promote distillation of new knowledge (see Butler, 2002; 2003 for a more complete description).

Consistent with the recommendations outlined earlier, the professional development model employed in each of our projects had certain, common core features (see Butler, in press). First, in each, we established learning communities comprising various combinations of teachers, researchers, educational assistants, district support personnel, and administrators. These individuals worked together within and across schools to find new ways of promoting self-regulation by their students. Second, we launched each project with workshops that introduced the theoretical principles underlying the SCL approach. These workshops focused on highlighting key instructional goals (i.e., elements of self-regulated learning), and on outlining theoretical principles for guiding instructional decision-making.

But, consistent with our theoretical framework, we did not anticipate that teachers would take the principles presented and translate them directly into practice. So, as a third feature of our professional development model, we followed up workshops with support to teachers as they sought to instantiate ideas in practice. In the context of teachers' authentic practice (i.e., during their work with students), researchers supported teachers by engaging them in co-planning, co-teaching, and then debriefing about events that unfolded in their classrooms. Fourth, in both projects, teachers were supported to reflect on their learning on "teacher reflection forms". Between collaborative meetings (with other teachers and/or researchers), teachers documented their attempts to use SCL, successes and challenges, possible revisions to what they were doing, and questions they wanted to raise. Finally, in each project teachers were supported to come together, not only within, but also across schools. In "all-schools" meetings, teachers had opportunities to share their experiences in trying SCL, to discuss positive outcomes, and to collaboratively problem-solve solutions to any problems they were experiencing.

The Secondary Project

Thirteen teachers participated across the two years of the secondary project (10 teachers in the first year, 10 in the second, 7 of whom continued from the first year, plus 3 new teachers). Twelve of the teachers worked with students between grades 8 and 11 within learning assistance or resource classrooms. These teachers focused on using SCL to meet the needs of students with learning challenges (about 50% with documented learning disabilities). One teacher used SCL to promote self-regulated writing in her 9th grade combined Humanities/English classroom. All participating teachers were female and they had between 2 and 32 years of teaching experience. The 13 teachers worked within 4 secondary schools that varied across a number of dimensions (e.g., age of the school, school culture, school schedule, neighborhood composition). But all were within the same school district located within the same suburb of a major western Canadian urban centre. The number of participating teachers across the four schools was 1, 2, 3, and 4, respectively.

Figure 3 provides a visual representation of the professional development activities as they unfolded in the first year of the project. The year began with three district-wide workshops in September, followed by three all-schools meetings during the year. In 3 schools, short, introductory workshops also were organized to introduce other school personnel to the project (e.g., educational assistants, peer tutors). Following on the initial workshops, the principal researcher supported teachers to apply SCL within classrooms. These school visits occurred roughly once per week in each class for the first semester, but the frequency subsequently declined. During school visits team meetings were sometimes held with groups of teachers, however most frequently the principal researcher spent the time (usually 1-1/2 to 2 hours) co-planning, co-teaching, and debriefing with individual teachers. Although teachers were encouraged to collaborate with one another between researcher visits, they only did so intermittently. But teachers did seize opportunities to work with other teachers from across the district in all-schools meetings. In the second year of the project, the overall structure of the professional development activities remained the same as in the first year. However, the initial workshops were abbreviated, and visits to classrooms were not as frequent as they had been in the first year.

To trace data related to teachers' learning processes, a case study methodology was employed (Merriam, 1998; Yin, 1994). Data sources included field notes from observations of teachers' practice in classrooms, teacher reflection forms, copies of instructional materials, transcripts of teacher interviews, and minutes from all-schools meetings. These data were submitted to systematic qualitative analyses to

trace teachers' learning over time in relation to professional development activities (Merriam, 1998; Miles & Huberman, 1994; Yin, 1994; see Butler, in press for a fuller methodological description).

In the remainder of this section, I highlight main findings from the secondary project that are related to the major themes in the current paper (for a complete report, see Butler, in press). One key finding was that, within our professional development initiative, we successfully engaged teachers in reflecting on practice. As one teacher explained, "I felt that I had a real opportunity to reflect on my teaching. [SCL] was very powerful that way. It helped me get the big picture of where we're going with these students rather than just trying strategy after strategy" (LN, 200-204¹). This quote also reflects another of our key findings, which was that teachers learned how to develop new instructional strategies grounded in a clearer vision of goals.

We also found that teachers made positive revisions to practice that were consistent with the SCL theoretical framework. Meaningful shifts were found in teachers' instruction, classroom routines, ability to meet individuals' needs, and communication with students. Significantly, adjustments to practice appeared linked to reconstructions of teachers' conceptual knowledge. As MN described: "It's kind of different than learning how to give a test where you learn exactly the procedure, when you can go and try it and check, yah, I did this, I did that. It's not really like that. It's sort of a bit more of a paradigm shift" (398-401). Further, we were encouraged to find that, by the end of the second year, teachers appeared to have made instructional changes that would be maintained over time, because they were linked to changes in conceptual knowledge. For example, CB explained how "the whole questioning approach to kids around ... what are you doing ... what's your task ... what do you have to do ... what have you tried so far. That whole repertoire of thinking is just pretty well engrained now" (207-215). Similarly CF described that SCL is now "just part and parcel of the way I think" (350-352), and that "understanding how to move a child through ... towards independence through SCL has become part of my thinking and being" (573-579). Our findings also clearly underlined, however, that making such meaningful shifts to practice, grounded in conceptual change, is difficult and takes time.

Consistent with the suggestion that social interaction during collaborative professional development provides language and cultural tools for making sense of experience (Englert & Tarrant, 1995), four teachers in our secondary project explicitly related learning SCL to learning a new language. As PM described, "it becomes part of your language too and then you start doing it with other ones before you even know it" (328-331). Similarly, CF explained "the language is really important, and that's what I found useful about you [Deb modeling] because I would listen like crazy when you were here to see what I could be saying that would move the students forward" (389-393).

As part of our evaluation of the efficacy of our professional development model, at the end of each year we asked teachers to describe activities they found most useful for their own learning or that they would recommend we use in the future. Our findings were that teachers appreciated the workshops for providing a theoretical framework. They also benefited from opportunities to reflect on practice and share ideas with others (e.g., with other teachers at all-schools meetings). Further, the vast majority of teachers emphasized the importance of having support within their own classrooms. For example, one teacher indicated that, "the most useful time for me was when Deb came to [the school] and worked with students while I worked with [them]" (LN, 66-67). LV explained, "I think the very best thing is to watch the process in action, watch Deb work with students, and then as quickly as possible, have her return the favor" (219-220). MH thought that what "is absolutely critical is having someone come in and model it for you, and then work along side you where you're attempting to do it and have time then to debrief

after about the struggles and what worked” (120-137). Similarly, PM described how it: “was so good watching her do it, and just watching her even turn around a student who started ‘I don’t know what to do’. You know, it’s just amazing to watch by the end of that period, they’re just sucked right into it” (135-140). Thus, teachers valued opportunities to co-plan, co-teach, and debrief within school visits with the principal researcher. It was also clear that they benefited from seeing SCL at work with *their own* students (Rennie, 2001; Stein et al., 1999).

Finally, it appeared that support to teachers (e.g., dialogue, modeling) was most effective when it was provided in context, as teachers tried to make different instructional decisions consistent with a new conceptual framework. This finding is reflected in the quotes in the last paragraph, which described collaboration in context. Similarly, consider TS’ recommendation to provide professional development where: “you have a chance to speak to somebody who’s standing beside you and say, ‘well, I would have done that, or, I could have asked this, or she should have done that’ ... the more conversation you have, I think is the more you learn” (249-252). Further, teachers made use of information from modeling when trying to guide their own teaching (e.g., when adopting language for interacting with students, as described above). But, they actively interpreted that information as they strove to make sense of SCL, rather than just imitating what they observed. As MN explained: “I don’t see SCL as something that everybody does exactly the same way, so I don’t think you need to necessarily mimic somebody else doing it. It’s more the process of trying, then somebody else trying, you know what I mean?” (383-389).

In sum, positive outcomes in the secondary project were that teachers were actively reflecting on practice and constructing new knowledge about teaching. Teachers’ shifts in theoretical frameworks could be associated with meaningful and sustained shifts in practice (Gersten et al., 1997). Teachers’ learning appeared to be spurred when we assisted them to link theoretical frameworks with authentic practice using a combination of workshops and situated support to teachers’ decision-making, and by promoting reflection on authentic activity. Collaboration appeared to provide language and tools (e.g., examples) that helped teachers interpret experience and re/co-construct knowledge about teaching.

At the same time, we noted two important challenges to our professional development model as operationalized in the secondary project. The first was that the project was very time intensive, involving many school visits by researchers. The second was that, although teachers appeared to shift conceptual frameworks to the point where new practices would be sustained, we were concerned that, at least in the first year of the project, teachers depended quite heavily on researchers to maintain their enthusiasm for the project. Thus, in our next project, we hoped to maintain the core structure of our professional development model, but to operationalize the specific components so as to require less intensive researcher intervention while at the same time sustaining teachers’ commitment to the initiative.

The Intermediate Project

Our professional development model in the intermediate project was grounded in the same theoretical framework that had guided our work at the secondary level. But our intention was to shift the model by focusing more on developing learning communities within schools, and providing fewer, more focused school visits by researchers as a follow-up to workshop activities. To support the development of collaboration within schools, we asked project participants to organize themselves into teams prior to the start of the project. We asked team members to work together during workshops in application activities. We also supported teams to explicitly plan for collaboration in schools, by helping them to identify times for reflection, co-planning, and debriefing within their school schedules (e.g., a Friday

lunch meeting between pairs of teachers followed by monthly meetings by the whole team), and to define roles and responsibilities for meeting teachers' professional development needs (e.g., responsibilities of administrative officers, the district, teachers, researchers). We provided an elaborated "teacher reflection form" for use by teachers between meetings and researcher visits, on which teachers documented approaches to using SCL, successes and challenges, possible strategies to try "next time", and questions to raise at meetings. Finally, we provided contact information so that project participants could fluently communicate with one another and with researchers by phone and/or by e-mail.

The intermediate project began late in the spring of 2002, in the same school district where we had conducted our project at the secondary level. We had hoped to start the project in the fall, but a province-wide labour dispute delayed the project. In spite of the labour unrest, fifty-eight participants attended the workshops in late April and May. These participants included classroom teachers ($n = 21$), learning assistance/resource teachers ($n = 20$), district support personnel ($n = 7$), administrative officers ($n = 6$), student teachers ($n = 2$), one teacher of ESL students, and one educational assistant. Follow-up classroom visits across the two years included 37 team members from 13 different schools (6 male, 31 female). All but three worked with students in grades 4 to 7. One teacher was a Business Education teacher at the secondary level. Two others worked at the primary level with children in grades 1 to 3.

To investigate teacher learning, we observed teachers' participation in workshops and collected data from all school visits. Data sources included field notes from workshops and from meetings and classroom observations during school visits, along with copies of relevant documents (e.g., lesson plans and materials; examples of student work). These data were systematically analyzed to provide an account of how teachers' learning was supported, and of how SCL was implemented in classrooms across both years of the project. In this paper I overview findings relevant to themes in the present paper.

Findings from the First Year

Major findings from the first year were, first, that teachers assumed more responsibility for their professional development than had the teachers in the secondary project. For example, we found that they were taking the initiative to meet, co-plan, and co-teach within their school teams, independently of researchers. Further, most teachers put in time to prepare (e.g., planning lessons for feedback) prior to researcher visits. It is possible that this difference arose because of systematic differences between secondary and intermediate settings, since secondary teachers are often more isolated from colleagues (making it more difficult to work collaboratively). Further research is warranted to see if similar benefits might accrue with the revised model at the secondary level.

Second, we observed that teachers were very actively experimenting with different ways to use SCL in their classrooms. How the professional development model played out in the first year is depicted in Figure 4. What this figure shows is that, as a follow-up to the April and May workshops, 32 team members at 11 different schools invited researchers to observe their efforts to use SCL. During these classroom visits, 22 different lessons were observed (see Table 1). Lessons were provided in a variety of subject areas, in both whole classroom and learning assistance settings, and at various grade levels. In each lesson, teachers attempted to promote at least some aspect of students' self-regulated learning (summarized in broad terms in the last column in Table 1).

Two representative examples are provided here to illustrate how teacher learning was supported in these first-year school visits. The first example comes from one school that sent 8 team members to

the introductory workshops in April and May (5 teachers; 2 administrative officers; 1 district support person). Four teachers and the district support person participated in the school visit on June 5th. Prior to the researchers' arrival, this team had co-planned a lesson focused on supporting students to better proofread their work. Then, they organized a 1/2 day school visit with the researchers during which (1) we met to discuss the planned lesson and fine tune how it might work, (2) the grade 7 teacher and the district support person co-taught the lesson at the grade 7 level while we and the rest of the team observed, (3) we debriefed with the entire team and planned revisions to the lesson, (4) two other teachers co-taught a variation of the same lesson at the grade 4 level, again observed by the others, and (5) we met for a final debriefing. The result was an exciting opportunity for a team of teachers and researchers to work collaboratively to try out new ideas in practice.

A second example was provided by another, very small, school that sent two teachers (one classroom; one learning assistance) to the initial workshops. These teachers co-planned and tried out a series of lessons prior to the researchers' visit. Then, on May 21st, they invited the researchers in to observe what they were doing. This 1/2 day visit also started with a planning meeting during which the teachers and researchers discussed a planned lesson, considered how the lesson reflected theoretical principles, and made minor revisions. Subsequently, the researchers observed one of the teachers implement the lesson with her students. This was followed by a debriefing meeting during which we collectively reflected on successes and challenges and considered implications for subsequent lessons.

Thus, findings from the first year of the project suggested that teachers were willing to take risks to try something new, and showed that teams of teachers within schools could be engaged in co-constructing and reflecting on revisions to practice grounded in new theoretical principles. It was clear in debriefing meetings that researchers and teachers both learned from the experience, contributing different types of knowledge and expertise to the interactions (Lave & Wenger, 1991). While researchers supported teachers' thinking about how to use SCL; teachers assisted the researchers to learn new ways in which SCL might be situated in classrooms.

However, as might be expected, teachers' initial efforts to implement SCL were not always successful. And, although debriefing sessions were useful in reflecting on successes and challenges, we had two concerns. One was that, in the way that school visits had evolved in this project, we were not in a position to support teachers *while* making initial decisions (e.g., while planning a lesson). Thus, we did not have opportunities to assist them in thinking about teaching in new ways at a key point in the instructional process. Further, when we did observe teachers struggling to use SCL, we were placed in the uncomfortable, and evaluative as opposed to collaborative, position of providing feedback *after* the fact. Thus, our plan for subsequent visits was to re-shift our support to be more proactive (vs. reactive). The school year ended before we could make these adjustments, but we appeared poised to build on the teachers' obvious enthusiasm when re-starting in the fall.

Year Two of the Intermediate Project

As in previous years, the second year of the intermediate project was launched with two consecutive workshops (optional for the previous year's participants). These workshops were similar to earlier workshops but were different in two important respects. The first was that, in the secondary project and in the first year of this project, teachers had consistently asked for more examples of how SCL worked. Thus, in the fall workshops we showed three worked out examples of SCL-in-use (in lesson plans and/or videos) that we hadn't shown teachers previously. Each example illustrated how

teachers had integrated support to students' self-regulated learning into their lesson planning. Second, in the earlier workshops we had focused primarily on defining instructional goals by defining key qualities of self-regulated learning, and on theoretical principles for supporting self-regulation. In the fall workshops, we provided a more detailed framework for integrating support to self-regulated learning within the context of lesson planning, derived from what we had observed teachers doing in the previous year. To assist teachers in situating the framework in practice, and to start them in active co-planning in teams, we started the workshop series by asking teachers to identify an authentic curricular goal that might form the basis for lesson planning, and to consider the learning they hoped to spur in students to achieve that curricular goal. Subsequent activities then involved school teams co-planning a lesson that would support self-regulated learning while at the same time achieving curricular goals. As in the previous year, we followed up the workshops with school visits with researchers, at the invitation of school-based teams.

One other change we made at the start of the second year was that we invited teachers to consider becoming SCL "teacher leaders" within the district. Our hope was to recruit several teachers who would master SCL theoretical principles to the point where they could serve as mentors to other teachers within the district in subsequent years. Three teachers accepted this invitation (2 from one school; 1 from another). These teachers worked for several months to learn SCL together, until one teacher went on maternity leave and the second teacher at the same school was overwhelmed by having to take her place.

After the enthusiasm with which teachers greeted the project in the first year, we were a bit surprised to find teachers to be more cautious at the start of the second year. As is depicted in Figure 5, only 17 teachers at 6 schools requested initial visits with the researchers. And, after a first round of school visits, teachers from four of the schools hesitated to set up additional visits (although many suggested they were still trying out ideas in schools). We knew that some of the decline in participation could be accounted for by very low morale in the schools following on the labour dispute in the first year, which was accompanied in the fall by numerous layoffs, shifting between schools by teachers who did remain, and continued uncertainty about the future. But we also suspected that we had made changes that were discouraging participation.

Thus, by January 2003, we were seeking to understand how teacher learning had been affected by the structure of and changes to our professional development model. Several possible explanations for teachers' more cautious response to the project in the second year emerged from our review of the whole-project data (i.e., from workshops & school visits). First, observations at the fall workshops suggested that teachers had a very difficult time selecting a curricular goal for lesson planning, defining the learning processes they hoped to promote, and linking instructional strategies with hoped for learning outcomes. While teachers very readily jumped to thinking of learning activities and possible instructional strategies, they had difficulty defining how those activities would work to achieve curricular goals. Further, when they started to consider the kinds of learning processes demanded by the activities they often assigned, they started to recognize gaps, between the kinds of demands they were making on students and students' background knowledge and skills, and between the kinds of learning demanded by activities and the kinds of learning they hoped to promote. Thus, it might have been that, in the first year of the project, teachers were more comfortable with a focus on defining instructional activities that would promote self-regulated learning. But in the second year, when we focused attention more specifically on embedding support to self-regulation within day-to-day lessons, we inadvertently prompted teachers to reconsider their whole approach to lesson planning. This was certainly unexpected

and unintended, because we had assumed teachers would be well practiced at lesson planning focused on achieving curricular goals.

Second, we were a bit concerned about teachers' reactions to the examples we presented. Some teachers appeared discouraged when they viewed the examples, and/or did not like specific strategies that were portrayed. Thus, after the workshop we wondered whether (1) we had inadvertently given the impression that there was one right way to do SCL, (2) teachers started to equate SCL with use of particular strategies, rather than remaining focused on instructional principles that could be situated in a variety of ways, and/or (3) teachers perceived too large a gap between examples and their own practice, so that the required changes appeared overwhelming. Also, recall that, in the first year, teachers knew they were the first ones to try SCL in their particular contexts. But in this second year, when we presented worked out examples, it may have appeared that there were now well-defined ways to implement SCL. In any case, we seemed to lose teachers' willingness to take risks and experiment in their classrooms (at least with researchers present). These possible explanations for teachers' responses to examples suggested we should re-think very carefully how and when to present examples as part of our professional development sequence.

A Case Study of Teacher Learning

To better understand how teacher learning had been affected by the structure of and changes to our professional development model, we decided to conduct an in-depth case study of the one teacher's learning. One of our teacher leaders-in-training, Jana¹, was selected as our case study participant, not only because she was willing to continue in the project, but also because, although she showed great promise in terms of her potential to learn SCL, she was still quite unsure about how to situate SCL in her classroom. As she explained in retrospect (in a final interview), Jana knew that SCL "was going to be a model that was going to help me get kids to get to be able to have a meaningful understanding of what it was that I expected of them, in their work. Now how that model would transfer into teaching is where I was struggling. I understood everything that was said, and that I read about it, and that clicked with what I was doing, but the problem was I didn't know how to take that and turn that, transfer that into a teaching situation" (JD int., 719-725). As such, our choice was a "purposive" one, in that we chose a case based on which we were likely to learn the most (Merriam, 1998). Case study data included field notes and documents from each school visit prior to January 2002. Subsequently, planning meetings and classroom observations were also audiotaped and transcribed, and we held an in-depth interview with Jana at the end of the year (see Butler & Dorsey, 2003, for more information).

We needed to be cautious in generalizing what we learned from Jana's case to understanding the learning of other teachers. First, in comparison to other study participants, Jana was a particularly committed, out-going, and reflective teacher. But, it was in part her ability to explicitly reflect on her learning that made her an excellent case study participant. Further, because Jana continued in the intermediate project when most other teachers did not, we worked more intensively with her than we did with other teachers in that project (so her experience differed from theirs). But, note that, in comparison to teachers in the *secondary* project, Jana actually received *less* support. Tracing her learning thus provided an interesting comparison to the learning of teachers in the more intensive, secondary study. Also, because it was often possible to cross-reference findings from Jana's case study with themes that emerged from whole-project intermediate data, the case study provided some converging evidence related to *why* other teachers might have responded differently in the second year of the project.

Starting in February 2002, we reframed our work with Jana in order to recapture the spirit of collaborative inquiry that we had established in the first year. We maintained our intention to have fewer, more focused school visits than we had in the secondary project. But we added back opportunities to shape her decision-making on-line, in order to help her shift her thinking to be more grounded in SCL principles. To that end, we set up a structure for working with Jana that involved two clustered visits within a single week period, repeated three times at monthly intervals (on Feb 3-6; Apr 28-May 1; and May 27-29; see Figure 5). The first meeting in each week was used for co-planning a lesson. For example, on February 3rd, Jana arrived at our planning meeting with a cartful of math books, but without a clear idea of what topic she should choose for a good “SCL” lesson (as if SCL lessons should be separated from the regular curriculum). So, we spent the meeting identifying her next curricular goal for her students (on ratios), and thinking through the process of lesson planning so as to embed SCL principles within that context. The second meeting then followed the same pattern as was used in the first-year school visits. For example, on February 6th, we met with Jana to refine the lesson on ratios, Jana taught the lesson while we observed, then we collaboratively reflected on successes and challenges, and on what Jana had learned in the process. In the rest of this paper we overview results from our case study that help clarify findings from the overall intermediate project and that explain Jana’s learning processes (see Butler & Dorsey, 2003 for a fuller report).

First, like her peers who struggled in workshops to link instruction to curricular goals, in school visits we observed how Jana started lesson planning by choosing materials or learning activities. For example, Jana arrived at our April 28th planning meeting with a story she had selected for students to read. It was only when we took a step back to think about her goals for the lesson (for students to identify different points of view in text), that Jana recognized that the story was not well suited for her intended purpose. Ultimately, Jana recognized that she needed to make decisions more linked to instructional goals: “What is my goal? And then how will I accomplish it? (But I leap to how, not goal) So my own strategy is to back up for (1) strategy goal, and (2) big picture goal” (Apr. 28th field notes, page 5). Similarly, at the May 27th school visit, Jana reflected, not only on how she was still struggling to maintain focused on her goals while planning, but also on the importance of keeping students focused on *their goals* when working in groups: “I was just thinking, in terms of SCL ... it was at that monitoring piece. When the kids are in a group: ‘is this working? Is this working for us? Is this what we are supposed to be doing?’ You know? And it is the same thing with me. Like, am I on task? Is this my goal? ... You’ve got to have something that gives you that alert, that I am not sticking with my goal again. I’m not.” (lines 773-780). Thus, parallel to our finding in the secondary project, a positive outcome that emerged from our work with Jana was her increasing ability to plan instructional activities based on a clear vision of goals (thereby more successfully *self-regulating her teaching*). Further, this evidence corroborates our observation that an obstacle to teachers’ success in the second year of the intermediate project was the difficulty they experienced in linking instruction to curricular goals.

Second, also consistent with our observations of other intermediate teachers’ reactions to the second year workshops, in her reflections during her final interview, Jana described how the process of trying SCL in the second year seemed more difficult than it had seemed previously. As she explained: “I had some success, which is interesting, ‘cause that one lesson I planned for Deb the previous spring, right after her first initial session, I planned a lesson, she came and observed ... and then we went and debriefed afterwards and I felt like it had worked. But it was when we got together as a big group and we had planning time and we went to town with units, like, I just got out of control. So I don’t know what happened there with me personally! But I went from the one lesson to the just getting too complicated” (JD int., 220-226). Her recommendation, for future workshops, was to keep it simple, and

to help teachers focus on planning just one lesson at a time: “I think maybe one of the things, and that’s so important here is to really reassure people that it is simple, like it’s not, it’s not a big unit and that people can start small. To take one lesson within a unit and say, ‘How am I going to set it up?’” (JD int., 384-387). Again, this finding corroborates our larger observation that teachers were overwhelmed in the second year.

Further, it is interesting to note that, for Jana, what made the planning process more transparent was keeping focused both on her goals and on SCL theoretical principles: “You know, when we were doing this, I was like ‘wow’, it was really heavy, it was like, how am I going to get them where I am going with this... this is so hard, but then you, you get going, and it’s... and now the goal is clear in my head and we have stayed very focused on that, it is not that hard” (May 27 school visit, 747-750). Further, she described how her learning was supported by researchers, not by giving her instructional strategies, but by helping her keep focused on goals. For example, when describing the benefit of co-planning with the principal researcher, she said: “Yeah, I think that was the most helpful thing. And her just always taking me back: “What is it you want the kids to get out of this? What is your goal? What is your goal?” And I’m like... and that’s, you know, that sort of helps to keep you on track” (JD int., 237-240). Similarly, she continued a bit later: “I think with this kind of strategy you really need feedback, you need people helping you say ‘What are you doing here? What is your goal?’” (JD int., 415-417).

Third, data from Jana’s case study provided important insights about both the contributions and limitations of examples for learning SCL. From Jana’s perspective, observing examples was not enough to know how to implement SCL in her classroom. For example, when describing her early struggles to learn SCL, Jana explained: “I said to Deb come in and plan with me, I don’t... I don’t know what I am doing. You talked about this, I have seen it, I seen other teachers do it, I have heard about it, I have read the stuff, but I am just not sure what it looks like, I have tried it on my own and it always becomes too much. Too big”. (JD int., 194-198). Notice here how, in spite of having seen SCL in use by other teachers (in visits with other teacher leaders, in examples at the workshops), she still did not know what SCL should “*look like*” in her own classroom. This finding is consistent with data from the secondary project suggesting that teachers benefit from exposure to SCL-in-action in the context of their own work.

Further, Jana’s experiences provided converging evidence for our secondary project conclusion that examples are most useful to teachers if they are linked to authentic goals and/or actively interpreted within a theoretical framework. As she explained, “to have examples is important, because teachers like examples ... I think it depends too, though. Because some teachers want, like, the photocopied sheet that they can do and try it out – they want the task. They don’t want to think, ‘what is my goal?’” (JD int., 387-391). Later, she described how she initially implemented one instructional activity she had adapted from another teacher’s classroom, so she thought: “Oh! I’m doing SCL, I have these sheets. And it wasn’t SCL. Right? It was somebody else’s stuff. And it’s not that people can’t borrow and trade how they have done SCL, how they took on this particular type of lesson. You can do that. I mean, someone can do my ratio lesson because we all have to teach ratios. But I think there needs to be a little bit, maybe, more support on how that was approached and why it was approached that way, if that person decides to take that on” (JD int., 448-453).

Fourth, again consistent with findings from the secondary project, Jana’s learning was promoted by supporting her reflection on authentic practice. As she explained, “So it’s... and I think it is one of the those experiences where like... gee, I had a lesson where this wasn’t working and then I had a lesson where it worked, oh, this is it! I see the difference. I think it has been a process of that” (JD int., 729-

732). Similarly, she explained that: “You know when you came in and we did the, the kids were supposed to do the dramatic readings and they didn’t! And I was like, ok, that wasn’t what I wanted. So you go away and you think, how do I... I need to back up and try things again... practically it is just something that you have to get in there and try. I think to get really” (JD int., 732-737).

Finally, Jana’s final interview clearly evidenced conceptual shifts by the end of the year (after just three sets of focused visits). Her description of SCL reflected her understanding of theoretical principles and their implications for practice: “In my own words, what I have done with it (laughing) and how I see it, in my room, it is a way of approaching teaching that makes kids accountable for really understanding what it is that they are expected to do, and really getting them actively engaged in what they are expected to do and so, and interpreting that. And in that process, finding a way that you can assess, before they have done the whole darn project and handed it in (or the lesson or whatever it is) that you can assess whether or not they are on track. Do they get what you are asking them to do? ... [The model] also bring kids to be sort of active learners, accountable learners, and as a teacher to be more of a facilitator, more somebody that asks questions, somebody who tries to anticipate what supports are necessary, tries to anticipate how to structure a lesson that allows for kids to do that active learning... and uh, and then provides enough of a process that they are going to be successful at what they are doing ... there is a concrete aspect to that and we have a sort of framework for that now” (JD int., 892-898). Thus, although more research is clearly warranted, it appears that our less intensive approach to school visits (compared to that provided in the secondary project) has potential to maintain the core components that were effective in the earlier project, while at the same time promoting teacher independence and shifts in conceptual knowledge.

Discussion and Conclusions

In the two projects described in this article, we tried to instantiate principles underlying our professional development model within different sets of concrete activities, including workshops, classroom visits, and cross-school meetings in varying combinations. Across the four-years during which these two consecutive studies transpired, we reflected on our successes and challenges in order to better understand teacher learning and teacher development. As is reflected in our chronology above, and parallel to Jana’s experience, our learning was arguably greatest when analyzing what did and what *didn’t* work (so as “to better understand the difference”). Although more research is clearly needed to test the explanations we have offered for our data, especially when considering the obstacles we encountered during the intermediate project (e.g., a labour dispute; teacher-leaders going on leave), a number of important conclusions appear to be supported by a convergence of data. It is these general conclusions that I briefly highlight in this final section.

In terms of recommendations for professional development activities that promote meaningful shifts in practice, findings from the secondary and intermediate projects converge to support the core theoretical principles underlying our professional development model. Consistent with our framework, effective professional development activities were ones that assisted teachers in coordinating theoretical frameworks with reflection on authentic practice (Palincsar et al., 1998; Rennie, 2001). Specifically, in our two projects, we were most successful in promoting teacher development when supporting on-line decision-making in light of new theoretical principles (Butler, in press), collaborative construction of new teaching strategies while maintaining a focus on goals (curricular goals; promoting self-regulated processing), and opportunities to reflect on successes and problem-solve challenges in a succession of learning experiences (Englert & Tarrant, 1995; Perry et al., 1999). Teachers valued concrete examples of

instructional materials. But, these examples only had a meaningful impact when they acted as cultural “tools” that fed into teachers’ planning processes, and were actively interpreted in light of a theoretical framework and in consideration of particular goals. Further, the best examples were provided when teachers had opportunities to reflect on new principles as they were enacted in their own classrooms (Henry et al., 1999; Perry et al., 1999; Rennie, 2001). When provided in combination and over time, these professional development activities appeared to promote “deep rooted” changes in teaching, grounded in shifts in teachers’ conceptual knowledge as opposed to mastery of specific routines (Gersten et al., 1997; Palincsar et al., 1998).

In terms of enhancing theoretical knowledge about professional development in relation to teacher learning, our research supports the value of a model of self-regulated learning for understanding individual and collective learning processes during collaborative teacher development (Kremer-Hayon & Tillema, 1999). By accounting for teacher learning within a self-regulated learning framework, we were able to coordinate cognitive, social practice, constructivist, sociocultural, distributed, and situated theoretical perspectives to provide a richer account of teacher learning (Barab & Duffy, 2000; Brown et al., 1989; Paris & Byrnes, & Paris, 2001; Vygotsky, 1978). Thus, a contribution of the present research is its focus on the interface between cultural, social and individual processes in accounting for learning in authentic practice.

Notes

¹ All names are fictional; “Pseudo-initials” represent teacher participants; Line numbers reference the source of a quote or description from teacher interviews, school visits, or meeting minutes. These are provided to cross-reference interpretations to the original data source.

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Table 1. Situating SCL Theoretical Principles in Practice in the First Year of the Intermediate Project.

Date	Subject	Context ¹	Grade	Topic	SCL Focus ²
May 16	Business Education	Class	10	Planning bank deposits & withdrawals	Interpreting task demands, setting goals, developing strategies
May 21	Reading/ Geography	Class	2/3	Making a map to trace the path traveled by a novel's characters	Interpreting task demands, developing strategies, defining criteria for self-checking
May 23	Math	Class	4/5	Understanding triangles & angles	Guiding learning, developing strategies
May 23	Science	Class	4/5	Making a simple machine	Interpreting task demands, defining criteria for self-checking, developing strategies
June 3	History	Class	5/6	Interpreting key events in a video	Guiding learning
June 3	Writing	Class	6/7	Writing a free verse poem	Defining criteria for self-checking
June 3	Math	LAC	5	Solving math word problems	Interpreting problems; guiding learning
June 4	Math	LAC	4/5	Measurement of distance	Guiding learning, developing strategies
June 4	Math	LAC	6/7	Solving problems with percentages	Understanding relevance; developing strategies
June 4	Writing	Class	4-6	Writing persuasive letters to defend a canceled TV show	Interpreting task demands, generating criteria for self-checking
June 4	Math	Class	5/6	Solving math word problems	Interpreting problems, generating criteria for self-checking, developing strategies
June 4	Writing	LAC	4-6	Summarizing ideas from a reading on whales	Interpreting task demands, using strategies for self-checking

June 4	Social studies	Class	5/6	Interpreting a provincial government article	Guiding learning, developing strategies
June 5	Reading/writing	Class	7	Proofreading and the qualities of good writing	Interpreting task demands, developing strategies for self-checking
June 5	Reading/writing	Class	4	Proofreading and the qualities of good writing	Interpreting task demands, developing strategies for self-checking
June 6	Research Project	Class	6/7	Completing a self-directed project	Guiding learning
June 6	Writing	Class	6/7	Writing a valedictory address	Interpreting task demands, generating criteria for self-checking
June 6	Math	LAC	4-6	Solving math problems	Developing strategies for solving problems
June 6	Math	Class	4/5	Memorizing multiplication facts	Guiding learning
June 6	Reading / writing	Class	4/5	Creating summaries of a novel	Interpreting task demands, guiding learning, generating criteria for self-checking
June 7	Math	Class	6/7	Multiplying fractions and mixed numerals	Interpreting problems, developing strategies for solving problems
June 7	Reading/writing	LAC	4-6	Reading and summarizing main ideas in a novel	Guiding learning

¹ Class = whole classroom setting; LAC = learning assistance or resource setting

² Ways in which teachers were working on promoting students' self-regulated learning (not necessarily successfully).

Figure 1. A model of self-regulated learning.

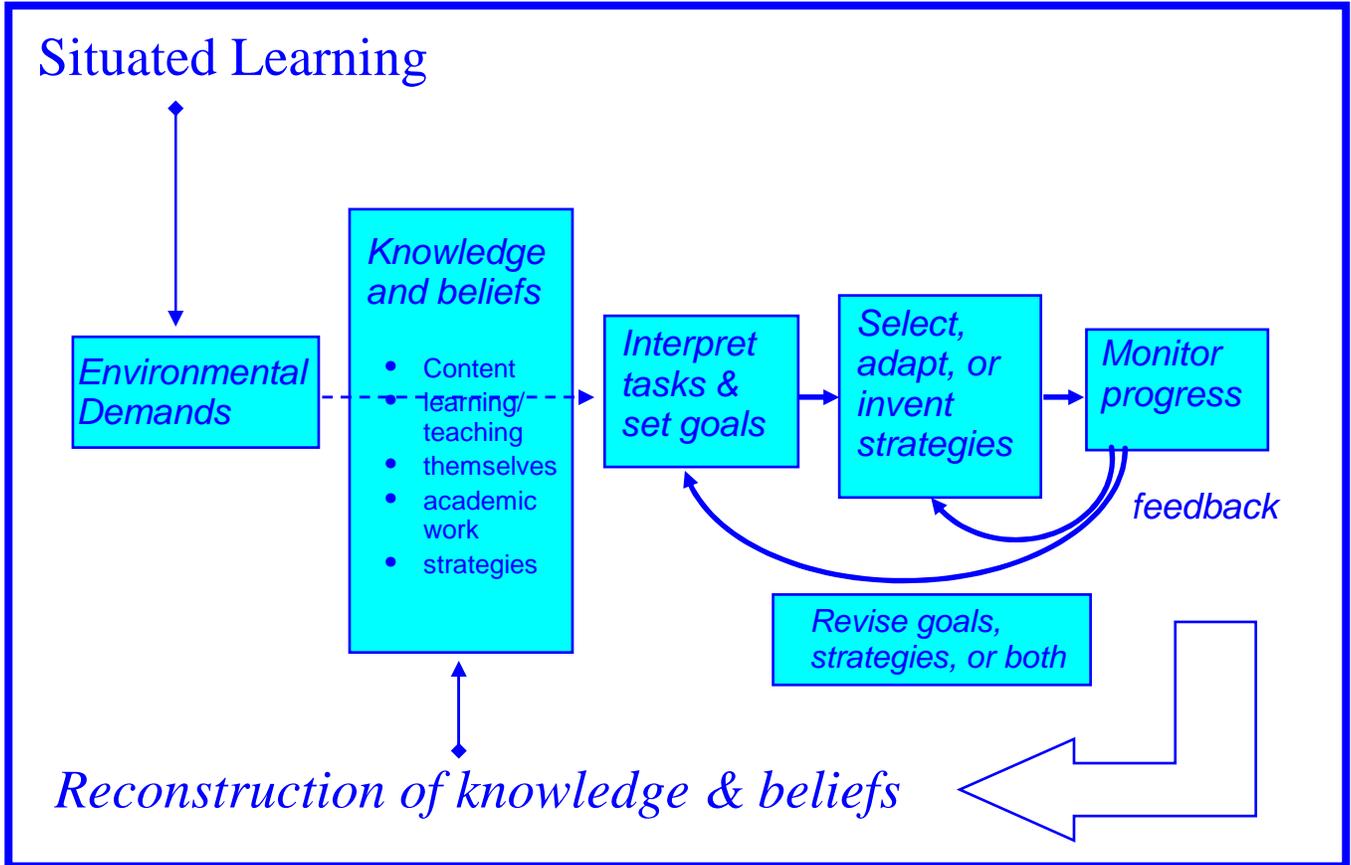


Figure 2. Collaboration and Self-Regulation in Teacher's Professional Development

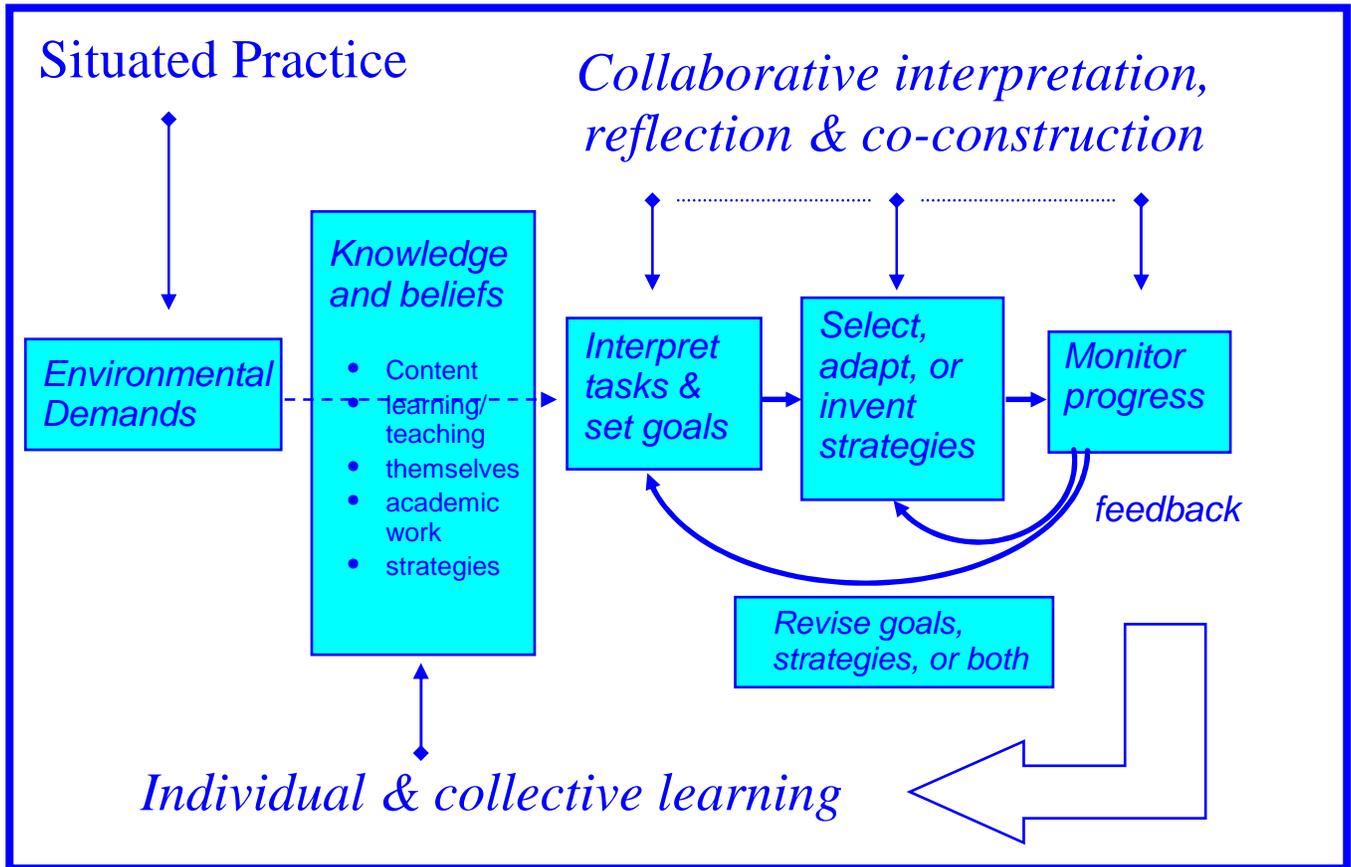
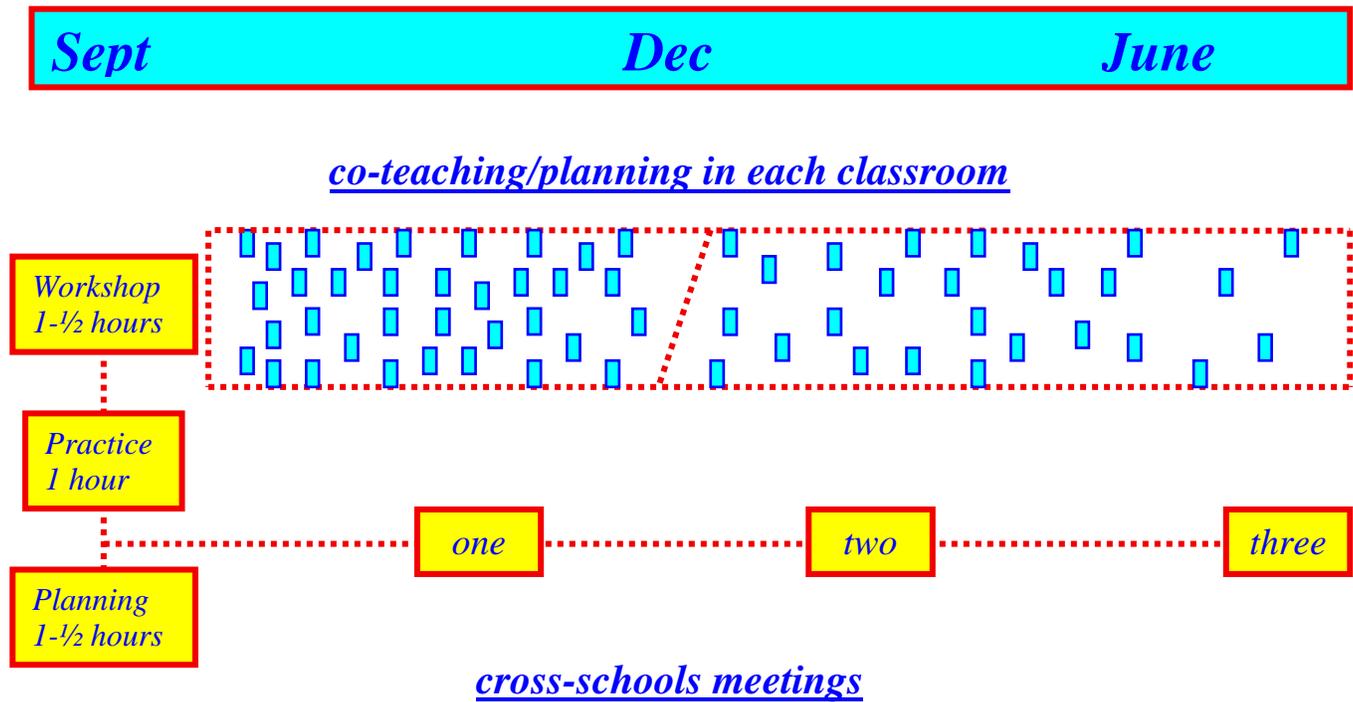


Figure 3. Our Professional Development Model in the Secondary Project¹



¹ This figure provides a generalized, graphic representation of the frequency of school visits (with the small blue boxes) but does not depict the actual number of visits.

Figure 4. Professional Development Activities in the First Year of the Intermediate Project

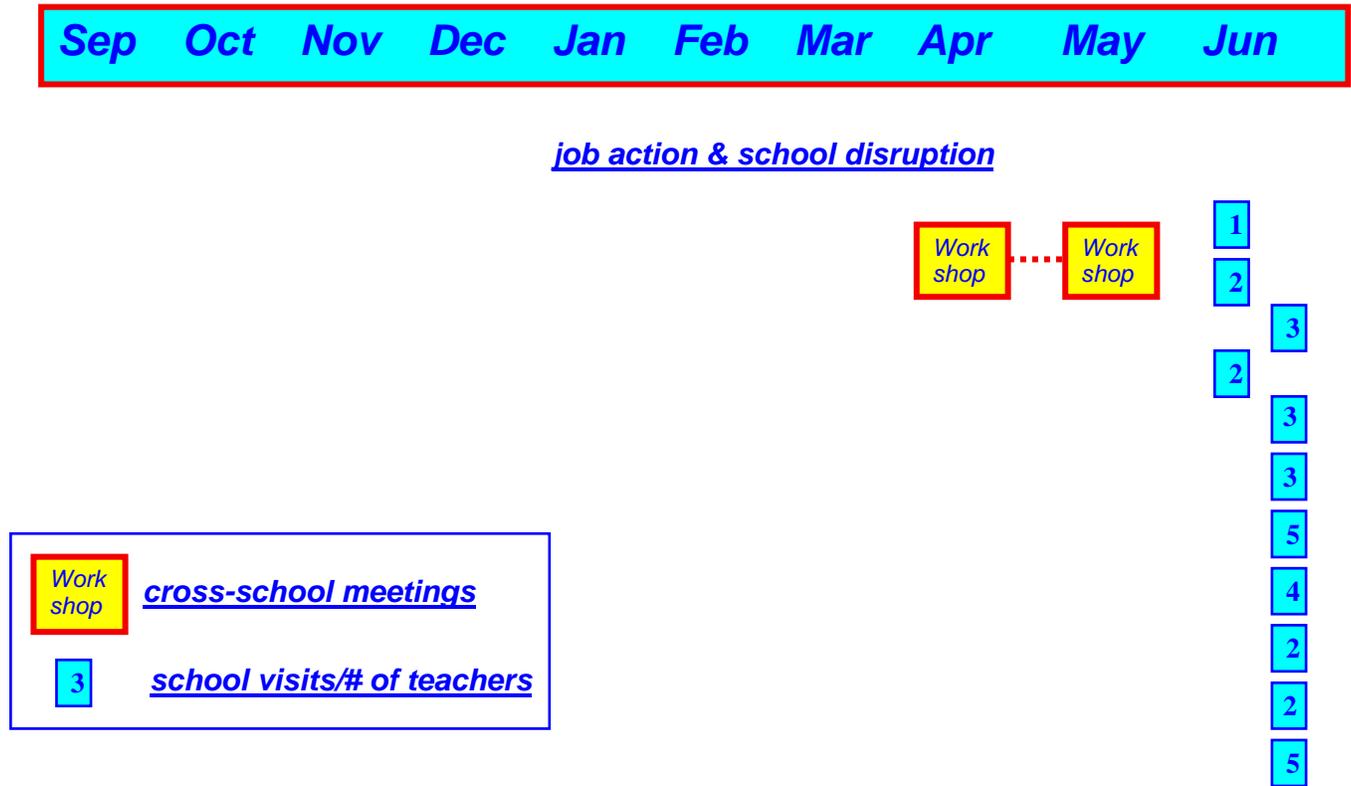


Figure 5. Professional Development Activities in the Second Year of the Intermediate Project

Sep Oct Nov Dec Jan Feb Mar Apr May Jun

Teacher layoffs and school reassignments

