

Professional Development and Meaningful Change:  
Towards Sustaining an Instructional Innovation

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Paper presented at the 2001 (April) meeting of American Educational Research Association in Seattle, WA. This research was supported in part by a Social Sciences and Humanities Research Council of Canada Standard Research Grant. We would like to thank all of the participating teachers for their invaluable contributions. We would also like to thank Vicki Rothstein for her consistent support and assistance. Correspondence concerning this manuscript should be addressed to Deborah L. Butler, Department of Educational and Counselling Psychology and Special Education, Faculty of Education, University of British Columbia, Vancouver, B.C. V6T 1Z4, Canada.

## Introduction

This paper emerges out of two-year study comprising a collaborative research project in which teachers and researchers are working together to situate a set of instructional principles within real school contexts to better meet students' needs. The goals of the project are threefold: (1) to determine strategies for situating particular instructional principles in learning assistance, resource, or whole classroom contexts within four secondary schools; (2) to evaluate the effectiveness of the instructional principles as applied in naturalistic contexts by tracing multi-faceted student outcomes, and (3) to describe and evaluate a model of professional development with promise to promote meaningful and sustained educational change. A companion paper details how instructional principles were adapted for use in various contexts in the first year of the project, and corresponding student outcomes (see Butler, Jarvis, Beckingham, Novak, & Elashuk, 2001). This paper focuses on issues related to professional development and structures for promoting sustained educational change.

## Professional Development and Sustained Educational Change

In the past decade, concerns have been raised about traditional models of professional development and the assumptions on which they were based. Problems have been noted with: (1) task-analytic approaches to defining and disseminating professional competencies, where teachers are considered technicians as opposed to reflective and decision-making professionals (Palincsar, 1999; Stamps, 1997); (2) top-down transmission approaches to disseminating knowledge (produced "externally") to teachers (Perry, Walton, & Calder, 1999), assuming that research and knowledge construction are the purview of researchers while teachers' roles are to implement research findings (Gersten, Vaughn, Deshler, & Schiller, 1997); (3) or, in contrast, activities that promote self-discovery by teachers alone (Palincsar, Magnussen, Marano, Ford, & Brown, 1998), assuming that there is no role for the interplay between practical and formalized knowledge; and (4) one-stop workshops rather than sustained support that assists teachers to learn and implement innovations (Borko & Putnam, 1998, Perry et al., 1999). In this latter case, it is assumed that teachers as learners can take abstracted descriptions of complex instructional principles and then implement them meaningfully in practice (Gersten et al., 1997). Two major problems have been associated with traditional approaches to professional development. These are: (1) surface level or shallow implementation of principles as opposed to deep rooted changes in practice (Gersten, 1995; Englert & Tarrant, 1999; Henry et al., 1999); and (2) little sustained use of innovations, even when they seem to be working (Gersten et al., 1997).

Alternative conceptions of teaching and knowledge construction have led to new professional development models. Some of these changing conceptions suggest that: (1) teachers are professionals, not mere technicians, and that teaching is an intellectual activity, requiring complex, contextualized decision making (Ball, 1995; Palincsar et al, 1998; Palincsar, 1999); (2) that instructional principles as applied in practice cannot be reduced to a series of algorithms, and correspondingly, that numerous concrete practices can be associated with a "faithful" implementation of underlying principles (Palincsar et al, 1998); (3) that the process of change requires a shift in conceptual knowledge on which decisions can be founded, and not just the development of procedural skills (Gersten et al., 1997); and (4) that the boundaries between teaching and research are fuzzy (Ball, 1995), in that teachers both co-construct practical knowledge within discourse communities (Palincsar et al., 1998; Henry et al., 1999), and also can contribute to the construction of formalized knowledge that can be shared with the professional educational community (Palincsar et al, 1998). New approaches to professional

development seek to find the interface (and blur distinctions) between “internal” (practice) and “external” (research) knowledge (Bos, 1995; Gersten et al., 1997; Schumm & Vaughn, 1995).

### Key Features of Professional Development Models

Perhaps the most common feature of new professional development models is the engagement of teachers in activities that promote “ongoing reflection on practice and underlying assumptions” (Borko & Putnam, 1998, p. 3). Teachers are supported to identify instructional principles associated with “best practices” (Ball, 1995; Englert & Tarrant, 1995; Palincsar et al., 1998), plan activities consistent with those principles, enact their plans in practice, monitor outcomes, and critically reflect on their efforts (e.g., Henry et al., 1999; Palincsar et al., 1998; Perry et al., 1999). This feature of models is consistent with a view of teachers as professional decision-makers who situate complex principles in practice, and has been associated with sustained educational change (Englert & Tarrant, 1995; Gersten et al., 1997).

A second feature of the majority of programs is that teachers are engaged in collaborative problem-solving. Groups of teachers and/or researchers work together locally (within schools) or peripherally (e.g., in meetings separate from immediate practice) in pursuit of common goals (e.g., helping students in a particular class, designing curriculum in a subject area, defining concrete instructional strategies consistent with instructional principles). Teachers work collaboratively to plan instruction, evaluate outcomes, and critically reflect on practice (Ball, 1995; Englert & Tarrant, 1995). A third common characteristic is that, within these problem solving-groups, teachers develop a shared language for talking about teaching and are supported to co-construct new knowledge within a discourse community (Bos, 1995; Englert & Tarrant, 1995).

To capture these and other features, many new models have utilized a “communities of practice” framework to describe their professional development initiatives (Englert & Tarrant, 1995; Henry et al., 1999; Lave & Wenger, 1991; Palincsar et al., 1998; Perry et al., 1999). Communities of practice have been characterized as “intellectual groups who share goals/purposes and engage in planning, enacting, and reflecting. In these communities, learning proceeds from action, expertise is distributed, and knowledge is socially constructed” (Perry et al., 1999, p. 218). However, within this common framework, different kinds of communities have been established.

For example, one dimension across which various “communities of practice” have differed is in terms of the nature of the “common goals” towards which community members strive. Most writers have stressed the importance of defining best practices that provide criteria for monitoring and judging action (Borko & Putnam, 1998; Palincsar et al., 1998). But in this context, best practices have often been broadly defined, focusing on general orientations towards teaching (Palincsar et al., 1998) or broad instructional principles (Ball, 1995; Henry et al., 1999; Perry et al., 1999). Communities are not frequently centered on helping teachers implement a given intervention, perhaps because such a goal has been associated with a technical view of teaching, a “top-down” approach to professional development, and no opportunities for choice or ownership by teachers. However, if boundaries between practical and formalized knowledge are blurred, and it is considered that the best formalized knowledge is grounded in practice, then a question arises as to how to take lessons learned from one practical context to a different instructional setting. Can professional development be structured that assists teachers to (re)construct practical and formalized knowledge related to an intervention while at the same time producing new knowledge? This is one of the issues addressed in this investigation.

Another dimension across which descriptions of communities of practice differ is in terms of how the relative expertise of researcher and teacher participants is described. Common across descriptions is the notion that expertise is distributed across community members (Henry et al., 1999; Perry et al., 1999). This suggests that, ideally, participants should bring to the community different types of knowledge, background, experience, and skills. But rather than linking researcher expertise to a kind of privileged, formalized knowledge that is fundamentally more informed than the practical knowledge of teachers, it is argued that both teachers and researchers possess formalized *and* practical knowledge, though perhaps related to different topics and to varying degrees. Indeed, educational researchers are often former (and/or practicing) teachers who have constructed considerable practical knowledge (e.g., Perry et al., 1999), just as teachers often have constructed formalized knowledge through a combination of academic and professional experiences. In this light, the challenge faced within a community of practice is to integrate and contextualize both kinds of knowledge within a particular instructional setting. Researchers and teachers can draw on their unique combinations of formalized and practice-oriented expertise(s) as they contribute to this joint effort. How this can be accomplished is also investigated here.

### The Current Project

As in initiatives defined using a communities of practice framework, in our project we considered knowledge to be socially situated, co-constructed, and emerging from reflective discourse based on meaningful experience (Perry et al., 1999). Our goals were to assist teachers in identifying principles underlying “best practices,” enacting principles in context, critically reflecting on outcomes (in relation to clearly articulated goals), and (re)constructing knowledge about teaching and learning based on new experiences (Borko & Putnam, 1998). Our hope was that, through this kind of active reflection, teachers would gain conceptual shifts in their knowledge about teaching and learning (not just mastery of technical or procedural skills) that would support sustained revision of practice (Gersten et al, 1997).

Significantly, the goals we had for teachers in our project paralleled the goals they held for their students. That is, in this project, researchers’ and teachers’ shared enterprise was to learn how to promote students’ reflective self-regulation of performance as they completed meaningful academic work (Butler, 1995; 1998-a; Zimmerman, 1994). Teachers’ task was to learn how to engage *students* in interactive discussions that helped *them* learn how to reflectively and planfully guide their own (learning) activities based on a clear view of (task) goals, and to critically monitor outcomes so as to re/co-construct knowledge about effective (learning) processes. Thus, not accidentally, the assumptions and instructional principles underlying our inservice structure paralleled the principles teachers were striving to learn (see Butler, 1995; 1998-a; Harris & Pressley, 1991). As a result, we were interested in whether the learning processes and gains experienced by teachers would parallel those they observed for their students.

Also consistent with a communities of practice framework, in this project teachers and researchers worked collaboratively to situate instructional principles in practice (Ball, 1995; Englert & Tarrant, 1995). Note that, while the instructional model we were using had been empirically validated at the post-secondary level, little research existed on how to adapt the model for adolescents. Further, even though we were supporting teachers to learn a model that had been successful in other settings, we did not think that a “top-down” or “one-shot” description of specific methods that teachers should use would promote meaningful change (Borko & Putnam, 1998; Perry et al., 1999). As an alternative, we provided on-going support to teachers throughout the year as they worked to develop, implement, evaluate, and revise instructional approaches consistent with the model they were striving to learn. Our hope was that this approach would promote teachers’ on-going and active reflection

on their use of the approach and sense of ownership over new teaching methods. A primary goal in this project was to evaluate how well these professional development activities supported teachers' sustained revision of practice.

In this project, researchers and teachers contributed different types of "distributed" expertise to our collaborative problem-solving efforts (Henry et al., 1999; Perry et al., 1999). The principal researcher contributed practical knowledge derived from 10 years of experience implementing the instructional model, albeit with adult students with learning disabilities. She also contributed the formalized knowledge she had accrued through advanced academic study (afforded through her University faculty position). Four graduate student research assistants contributed various combinations of practical and formalized knowledge related to best practices in teaching, the specific instructional approach, the needs of adolescents, and research methodology. The complementary expertise contributed by teachers included practical and formalized knowledge about effective teaching, the secondary curriculum, students, and research methods gained through a combination of experience (e.g., working with students with learning disabilities at the secondary level) and academic study (e.g., in bachelors, diploma, and/or Masters level study).

Our initiative was launched when teachers and researchers came together within a "workshop" as part of a district's professional development program. However, as noted above, it was understood that this workshop could only serve as a launching point for facilitating meaningful change. Thus, the workshop focused on defining common goals for participants in the project (e.g., promoting reflective and self-regulated learning by students), as well as initial instructional principles (that had been adapted for use at the post-secondary level). From that first workshop, what could be described as "communities of practice" were fostered at two, nested, levels. First, within participating schools, development of "schoolhouse" communities (Palincsar et al., 1998) was supported that included one to four teachers, the principal researcher, one or two research assistants, classroom assistants, and other individuals who worked day-to-day with the same set of students (namely peer tutors and/or youth care workers). Professional development activities within schools included group meetings (i.e., planning sessions), opportunities for experiential learning, co-teaching, modeling, and observations with debriefing. Second, across schools, a community was fostered that included participating teachers from each school, the researchers, and district resource personnel. At three all-schools meetings, participants outlined successes and challenges (for implementation and research), and then met in small working groups (ala Perry et al., 1999) to share experiences, trade ideas, and problem-solve further actions.

In the remainder of this paper, we describe selected aspects of the project in more detail and outline our research procedures. Then, building on identified criteria for judging the success of change efforts (e.g., Bos, 1995), we present findings pertaining to the following questions: (1) did positive outcomes emerge for students following teachers' shifts in instructional practice?; (2) did positive outcomes emerge for teachers while participating in this collaborative project?; (3) What was the quality of teachers' and students' learning processes while participating in the project? Were there parallels in what they experienced?; (4) How did participants work collaboratively within and across schools to situate specific instructional principles in practice?; (5) Which professional development activities seemed most effective to teachers in terms of promoting meaningful change? What did teachers think were the best qualities of teacher-researcher interactions?; and, finally, (6) What barriers, limitations, and/or challenges did teachers feel impeded their efforts to make changes in practice and/or to implement research procedures? Conclusions will be drawn regarding the nature of professional development activities that have the potential to promote and sustain educational change.

### Participating Teachers

Following on the introductory workshop, 10 teachers (all female) decided to join the project. Nine of the teachers chose to implement new instructional principles in learning assistance or resource settings. One teacher chose to revise her approaches within her combined Humanities/English classroom. Teachers in resource blocks included students in the project who were in grades 8 to 11. The students in the combined Humanities/English class were all in grade 9. The number of years teachers had taught school ranged from 2 to 32. Three teachers could be considered “veterans”, with teaching experience spanning longer than 20 years, while four teachers were relatively new to the field, having taught for less than 5 years. Most of the teachers held a BA degree along with a teaching certificate ( $\bar{n} = 8$ ). Two of these teachers also had Diplomas in Special Education, one had a post-baccalaureate specialization in working with English as a Second Language students, and three held or were working towards masters degrees. The final teacher held a Bachelor of Education degree (B.Ed.) plus a Diploma in Special Education.

Participating teachers were drawn from four schools that differed in multi-dimensional ways. One school was brand new, so that teachers were in the process of defining relationships and systems, while teachers in another school operated in a long established context. A third school was undergoing extensive renovations. Two schools operated on a semester system, where students attended support blocks daily. In contrast, classes at the other two schools were held across the whole year (on a Day 1/Day 2 schedule) so that students typically attended support blocks every second day. Criteria for students’ entry into the resource or learning assistance blocks varied from school to school (e.g., based on the severity of the difficulty experienced by students), as did how services were provided. Finally, the number of participating teachers across the four schools were 1, 2, 3, and 4, respectively. The result was that teachers had varying opportunities to collaborate with fellow teachers within schools. Nonetheless, three of the schools involved support staff in the project (e.g., peer helpers, educational assistants, youth care workers), which extended “within schools” teams for all but the school with three participating teachers.

### Introducing the Strategic Content Learning (SCL) Instructional Model

The first introductory workshop focused on three related topics. First, the nature of self-regulated, or strategic, learning was discussed so as to articulate instructional goals. More specifically, attention focused on how effective performance requires students’ active and reflective coordination of their own learning activities based on a clear vision of task demands (see Butler, 1995; 1998-a). Thus, it was argued that effective instruction needs to promote students’ construction of (a) metacognitive knowledge about academic tasks, learning strategies, and themselves as learners (Butler, 1998-b; Wong, 1991), (b) sense of control over learning (i.e., as reflected in their causal explanations for performance or perceptions of self-efficacy; Bandura, 1993; Borkowski, 1992; Schunk, 1994), (c) task performance, (d) strategic processing, and (e) independence and self-direction. Second, descriptions were provided of the kinds of problems that students with learning challenges often face that undermine academic success (e.g., failing to analyze task demands when confronted with a new assignment). Finally, instructional principles underlying one intervention model, the Strategic Content Learning (SCL) approach, were introduced. It was at the end of this workshop that teachers were invited to participate in collaborative research focused on (1) defining strategies for situating SCL in secondary settings; and (2) evaluating the success of our collaborative efforts.

A bit more information about SCL is needed to clarify the kinds of instructional shifts that teachers were trying to make. Note that, in many approaches to strategy training, instruction proceeds from the kind of “top down”, “task-analytic” approach prevalent in traditional professional development models (e.g., Ellis & Larkin, 1998). In these strategy training models, teachers or researchers identify strategies that effective learners use,

break them down into a series of steps, and then use explicit instruction and modeling to teach the strategies to students (e.g., Ellis, 1993). In contrast, in SCL, the focus shifts from “teaching strategies” to promoting students’ “strategic learning” (Butler, 1994). More specifically, teachers support students to self-regulate learning in the context of meaningful work (i.e., to define task demands, select, adapt, or even invent learning strategies based on what they are trying to do, monitor outcomes, and revise efforts accordingly; Butler, 1995; Butler & Winne, 1995). As a result, when using SCL, teachers shift from providing direct explanation and modeling of predefined strategies to mediating students’ strategic processing. Thus, all teachers in this project had to develop systems that allowed them to: (a) assist students to “think through” problems and tasks rather than telling them what to do (e.g., what strategy to use; how to solve the problem); (b) observe and question students in a kind of on-going, dynamic assessment to determine students’ current understandings and extant approaches and to define areas in need of support; (c) guide students’ cognitive processing as they worked together to develop effective solutions to tasks; (d) collaborate with students to co-construct strategies that met each individual’s needs, and (e) encourage students to articulate and record emerging understandings about learning.

Among the 9 teachers who implemented SCL in learning assistance or resource settings, only 4 teachers (at the same school) were providing “traditional” strategy training, framed within “mini-lessons,” prior to the start of the project. Thus, in that school, part of the instructional shift teachers wanted to make was from providing mini-lessons about predefined strategies to fostering students’ independent strategic learning. They felt that SCL contextualized students’ development of strategies better in the context of pressing work.

At the same time, across all of the schools, support blocks also were typically used to help students complete (home)work from their academic classes successfully. Teachers’ typical approach was to help students keep track of and manage assignments (e.g., with agendas) and to provide content-area tutoring (e.g., explaining a concept in science, quizzing students before an exam, showing students how to complete a math problem). While teachers in these classrooms wanted to promote independence (which was why SCL appealed to them), they felt pressure to provide quick and efficient help to students as they struggled to get pressing work done. They recognized that SCL might help them make a shift from focusing on such short term goals to fostering more long-term independence. To accomplish this, teachers had to shift from providing direct explanations about content or processes to facilitating students’ development of self-sufficient learning processes in the context of meaningful work.

Finally, one teacher chose to implement SCL in her English/Humanities classroom with an initial focus on writing instruction. Her goal was to help students reflect on and build writing processes as they learned about different writing genres. The shift for her involved integrating SCL into the writing instruction she provided so as to focus more explicitly on writing processes. Her unique challenge was to find ways to foster students’ strategic processing and co-construction of individualized strategies with an entire class of students.

## Method

Throughout the year, data were collected to trace the process of professional development and associated student and teacher outcomes. At the start of the project researchers met with teachers to discuss possible procedures for documenting the project and associated outcomes. The researchers provided a general

structure that had been used in previous studies to launch the discussion. Subsequently, and over time, the teachers and researchers adapted this generalized framework as they defined systems for this new study.

To trace students' progress in previous research, multiple parallel case studies had been embedded within a single-group pre-posttest design. Pre- and posttest questionnaires and interviews had been used to measure changes in students' metacognitive knowledge, perceptions of control over learning, and strategic approaches to tasks. In-depth case study data had included traces of students' task performance, copies of students' developing strategies, and written notes from teachers who observed students' progress in sessions. For this project, teachers and researchers also decided to conduct multiple case studies, but this time within a two-group (intervention/control) pre-posttest design. Teachers participated in defining control groups that would be a fair contrast to their own instructional contexts. Pre- and posttest questionnaires were used, but not student pre- and posttest interviews (given the large number of student participants).

After a good deal of collaboration, teachers and researchers ultimately constructed several approaches to collecting qualitative, case study data. The goal underlying these efforts was to document student outcomes across time in relation to intervention. Data collection strategies here included: (1) portfolio boxes that were used to collect samples of students' work and to facilitate access by students, teachers, and researchers to class and research materials; (2) copies of the "strategy sheets" on which students recorded personalized learning strategies; and (3) "teacher reflection forms" on which teachers make notes during or right after instructional interactions. Teachers' goals when completing teacher reflection forms were to (a) document student progress, (b) describe how they worked with students to promote independent and strategic learning, and (c) reflect on the success of their efforts as they tried to change their instructional practices. Across the year, what started as a rough outline of a possible teacher reflection form was adapted by teachers within and across schools. Ultimately, how teachers chose to reflect on their practice fit with their research goals, preferences, interests, and personal styles.

Finally, several data collection strategies were used to document and evaluate our collaboration with teachers and the process of instructional change. These sources of data included: (1) semi-structured observations of classroom instructional activities; (2) summary notes from the three all-schools meetings that were held near the beginning, in the middle, and at the end of the first year, respectively; and (3) end-of-the-year, semi-structured interviews held with participating teachers (who were implementing SCL). In these interviews, each of the 10 teachers was asked to describe (a) student successes and disappointments, (b) outcomes they experienced as teachers, (c) their perceptions of inservice and research procedures, (d) whether they would recommend the intervention to other teachers, and (e) advice they would give to new teachers who wished to try using the instructional model.

While a companion paper summarizes the full set of data documenting student outcomes, results summarized in this paper derive from teacher interviews and all-schools meetings. These are the data that speak most directly to the research questions addressed here, which focus on describing and evaluating the process of teachers' professional development. Data from teacher interviews and from the three all-schools meetings were analyzed using systematic and rigorous analysis techniques (Merriam, 1998; Miles & Huberman, 1994; Yin, 1994). First, all interviews and meeting minutes were transcribed and line numbers were assigned to the transcripts. Pseudonyms were assigned to each school and each teacher to ensure confidentiality. All sources of information were then tagged with an identifying referent (e.g., "TL, 31-35" refers to the excerpt from Tammy Lansing's interview, lines 31 to 35).

Next, four researchers involved in the project met to review the data. To begin, we decided to sort each piece of evidence based on its fit to particular research questions (e.g., if it described a student outcome or presented a teacher's opinion about a professional development activity). This rough sorting was simply an organizational strategy that helped lend some initial order to the data. At least two researchers reviewed each piece of evidence before agreeing on this initial sorting. When pieces of evidence were clearly related to more than one question, they were included in both locations.

As a next step in the data analysis process, the four researchers met again to consider how the evidence "answered" the research questions. A set of codes was collaboratively constructed that captured the meaning expressed in each piece of evidence. As a first test of the provisional codes, all four researchers examined each piece of evidence and assigned one or more codes. Memos were kept of observations and concerns that emerged from this first attempt. A follow-up meeting was held where the codes were revised. Subsequently, two researchers independently applied the revised codes to another subset of data. Inter-rater agreement in the assignment of codes at this stage was acceptable. Therefore, after making just minor modifications to categorization criteria, the two researchers coded the full set of data. Final inter-rater agreement on the full set of evidence was 92%. Thus, we had considerable confidence that the coding set we had identified could be matched reliably to the data. The final set of codes is presented in Table 1. All disagreements were resolved through discussion.

Once all of the data were coded, a final analysis strategy was employed. Specifically, tables were constructed that summarized the data and allowed us to check for underlying patterns (Miles & Huberman, 1994). Columns in each table represented sources of data (i.e., each teacher interview or all-schools meeting). Rows reflected codes (or coherently related sets of codes) that summarized the meaning derived from the data. Recorded in each cell was the referent for a particular piece of evidence. Thus, when tables were examined for patterns, it was possible to ascertain the consistency with which teachers made a particular observation, the emphasis placed on a topic by any given teacher, and the prevalence of topics raised at all-schools meetings. Conclusions drawn in the results and discussion section were based on inspection of patterns in these tables (see Table 2 for an example).

## Results and Discussion

In this section, we present findings pertaining to our six research questions. To review, we examine teachers' perceptions in interviews and all-schools meetings concerning: (1) student outcomes, (2) teacher outcomes, (3) the quality of their own and students' learning experiences, (4) the nature of collaborative activities, (5) the most effective professional development activities and interactions with researchers, and (6) barriers, limitations, and challenges to shifting their instructional practices and/or implementing research procedures.

### *Student Outcomes*

Table 2 presents a summary of teachers' perceptions of student outcomes. These data suggest that, in interviews and all schools meetings, every teacher identified some kind of beneficial outcomes for students (see

the row of X's in the last row of Table 2). In a few cases the gains teachers described could not be further categorized because they were couched in quite general terms (e.g., students "excelled.") But teachers also specified improvements for students in their (1) confidence, (2) understanding of task demands, (2) strategies for learning, and (4) self-awareness. Most significantly given the goals of the project, teachers also consistently described positive shifts in students' levels of self-direction, independence, responsibility, and/or control over their own learning processes.

For example, at the first all-schools meeting teachers described how SCL "builds confidence with students", "creates awareness of strategies already developed", and "provides opportunities for choice" (AS1, 85). At the second all-schools meeting, one teacher explained how students' strategies were evolving to become more task specific, where they had been very general at the beginning. Another teacher described to the group how her students' "work ethic had improved." She found that her students were assuming "more ownership and control," and were "taking more responsibility for their work" (AS2, 101). Other teachers described students as "more focused on task analysis" (AS2, 95) and "more independent learners" with "greater self-efficacy and independence" (AS2, 129).

In final interviews, teachers echoed the comments that had been made at the all-schools meetings. The pieces of evidence presented below reflect the kinds of positive outcomes for students that were described by teachers at the end of the first year. Note how teachers focused both on gains for individual students and on outcomes that were more generalized. Taken together, excerpts from all-schools meetings and final interviews reveal how teachers' perceived multi-faceted and inter-connected gains emerging for students in their classrooms.

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- ?? "[A] gained confidence in her ability and has taken full ownership over her learning" (CF, 14-19).
- ?? "Other people observed that my students were more self-directed. I would sit back and think, wow, these kids really are more self-directed and becoming independent learners." (CF, 49-51).
- ?? "Students' approach to the task improved from the beginning of the year. They definitely had the idea that it's important to understand the question and come up with some attach strategies. I think also, self-confidence." (LN, 13-15).
- ?? "For [D], it was her organization that improved. I would say that gains were seen in the areas that we worked the most with SCL. For D. this is where the need was. At the end, she definitely had more of an awareness of what worked for her." (LN, 21-15).
- ?? "I definitely think they have gained from thinking more independently." (EH, 13-16)
- ?? "It's an approach that respects them and impacts on self-esteem. And it helps them to take control and feel in control." (TM, 47-48)
- ?? "It gave them strategies to focus on and look at and say, 'oh yeah, this does apply pretty much right across the board, or, I can adapt it.'" (TL, 28-30)
- ?? "I saw the progress some of the students made and the sense of accomplishment they seemed to feel when they got their marks back" (TL, 238).

### *Teacher Outcomes*

Table 3 presents a summary of evidence related to outcomes experienced by teachers. As with the student outcome data, all teachers were able to identify gains they experienced during the first year of the study

(the bottom row of X's in Table 3 document the consistency of this finding). Gains teachers described could be grouped into three broad clusters. Specifically, teachers reported accruing: (1) concrete benefits for practice, (2) greater insights into their teaching style or effectiveness, and/or (3) improvements in communication with students.

First, concrete benefits that teachers described included more effective classroom routines, improvements in instructional methods, and/or personal benefits (e.g., reduced stress). Examples of some of these concrete benefits (from all-schools meetings or final interviews) were:

- ?? At the first all-schools meeting, teachers reported that the “[SCL] model helps to alleviate stress”, “less time is wasted in ‘getting going’ since students have strategies that they can reflect on for independent problem solving.” (AS1, 103).
- ?? At the 2nd all-schools meeting, teachers report how SCL helps them to be more systematic and organized in terms of managing their time with their students (AS2, 129).
- ?? “The spin off as we noticed in the fall, and continue to, is it sets a tone. In the class, a focus on working and supporting and really thinking about what you’re doing and it’s a good sort of settler.” (TS, 206-209)
- ?? “It was an opportunity for more professional growth... New ideas of how to help the kids.” (TL, 235)
- ?? “I really like the fact that it’s based upon individual students. I like that it gives focus, structure to your teaching, helps me keep the goal in mind.” (TM, 199-201)
- ?? “[I learned to] use questioning and to try to understand how the student approaches tasks before you start giving them strategies.” (CF, 71-73)
- ?? “SCL helped me to sit down and analyze what had to happen” (TL, 158)

Second, another consistent finding (from 9 out of 10 final interviews and each of the all-schools meetings) was that teachers gained insights into their teaching practices or effectiveness while participating in the project. The following excerpts from teacher interviews illustrate some of the insights teachers described:

- ?? “Being teacher-directed is more efficient in getting out the information, but it comes down to a philosophical question of content vs. process. Process is really what it’s all about and I don’t really see why we couldn’t cut down on some of the content to allow for more process.” (TL, 196-198)
- ?? “That’s my philosophy. SCL made me realize I need to do less talking and give more wait time and give them more opportunity to do more thinking.” (MP, 224-228).
- ?? “Talk less. Listen more. Listen more to where the student is. For me I felt that I understood where their comprehension was, and if I had stopped for a while longer, I would have more quickly seen that the student wasn’t really with me.” (LN, 190-192).
- ?? I guess an affirmation of the feeling I’ve had about education is that students should be more independent, that we should be encouraging individuality in the sense of trying to provide for them ways in which they can learn that show that we respect them.” (LV, 224-228).
- ?? “I like the adjustment in thinking. The slowing down. Because we’re so eager all the time to get kids on with things because they have deadlines and things to accomplish. And so you end up doing stuff for them, which isn’t facilitating independence.” (CB, 194-201).
- ?? “I found myself being more open.... I thought I was a good listener before this [SCL], but I think I became a better listener.” (CF, 74-75)

?? “I mean, it’s just kind of more... more clear. Like, a lot of those things you kind of think of ... you kind of have an intuition about them ... you know they’re going to remember more if I don’t tell them and if I make them work it through...” (EH, 513-518).

The third type of gain that teachers reported was improved communication with students. One shift teachers described was towards more discussion and connection with students. For example, at the first all-schools meeting, teachers agreed that the SCL model “promotes meaningful discussions with students and provides opportunities for choice” (AS1, 85). Similarly, at the second all-schools meeting, teachers related that SCL helps to “build professional intimacy with students” (AS2, 129). Teachers also described how they were better able to assess student needs because they listened to and observed them more closely. For example, TM explained that SCL “opened up my eyes for what level he was really at...by enabling him to show me where he needed help. I was surprised to see this kid really couldn’t read” (15-19). Similarly, CF thought it was positive, when “Deb and I were talking [while working with A] and Deb really helped me see how A processes information.” (CF, 172-173).

Finally, while describing gains that they made, teachers often endorsed components of the SCL model that they felt promoted more effective teaching and learning. The insights excerpted earlier provide some examples of how teachers valued certain instructional principles (e.g., talking less and listening more). The following excerpts also illustrate how teachers both gained insights into teaching practices and affirmed the instructional principles they were applying:

?? “I gained more awareness of the benefits of kids writing down their strategies. How important the step is of thinking about, talking about strategies, but also writing them down, and documenting them. It validates them.” (MP, 214-219).

?? “I guess basically making them think through things for themselves, where I think before I wouldn’t have necessarily had that cognitive aspect as much.” (EH, 537-538).

?? “I found that I was still imposing my own attitudes and views on kids that were subtle enough that I really wasn’t aware I was doing it. And I really loved the whole concept of making students more independent, more responsible.” (LV, 60-64).

That teachers associated the project with positive outcomes for students and enjoyed being part of the study also was evident across various sources of evidence. For example, when asked in final interviews whether they would recommend SCL to colleagues, every teacher said “yes”. CD explained: “Absolutely. There are too many kids who are spoon fed the information and we need to turn them into independent thinkers. I think this is just a marvelous way of doing it.” Their actions were consistent with these statements. For example, teachers recommended the intervention to colleagues (so that two teachers came aboard mid-year) and/or initiated teaching instructional principles to others in their “schoolhouse” communities (e.g., planning additional mini-workshops for peer helpers or educational assistants).

### *The Quality of Teacher and Student Learning Processes*

In our coding of data, we found many pieces of evidence that described how students and teachers were both actively learning during the first year of the project (see Table 4). This finding lends credibility to our description of the SCL intervention (i.e., as designed to promote active and reflective *learning*), teachers’

successful implementation of the model (given that they were promoting students' active reflection), and our description of our professional development model (i.e., as designed to promote active and reflective *teaching*).

Evidence for students' engagement in active reflection is provided in the first row of Table 4. In each of the all-school meetings and in seven final interviews, teachers described how students were thinking more actively about learning in the first year of this project. For example, LV explained, "The students for whom it clicked, it made them think about their own learning, which I really liked because I don't know that we do that enough in school. We tend to feed kids. We sort of pump them full of stuff and tell them how to learn" (9-18). Similarly, CF explained that one of her students now "thinks about strategies all the time and thinks of strategies for other people" (24-25). Additional evidence for students' active learning was presented in Table 2. Recall that among the student outcomes that teachers reported were gains in students' understanding about task demands, strategies, self-awareness, and most significantly, independence and self-direction. These gains also are indicative of students' increased reflection on learning processes.

Rows 2 and 3 of Table 4 describe teachers' active learning processes. In eight of the final interviews, teachers described how they were thinking actively about teaching while trying to revise their practices (row 2). For example, LN 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" (200-204). Similarly, TL explained that implementing SCL in her English/Humanities class "forced me to sit back and think about lower end students in the class and forced me to be more reflective in how to help these students" (222-228). In addition, in four interviews and each all-school meeting (see row 3), teachers elaborated that making instructional shifts requires time to adjust to a new way of thinking. As TM succinctly stated, "teaching style is something that is going to change with time" (199-201). In her final interview, CD captured her learning process in a series of self-reflections. Many of her comments centered on her recognition that it would take time to change: "It's a bit scary, but maybe that's me, facing something that is totally new and I knew nothing about. So, you learn as you go." (CD, 331-332). Additional evidence of teachers' active reflection was provided in Table 3. Recall that a major gain described by teachers were new insights into their teaching styles or effectiveness. This type of gain can be associated with teachers' active reflection on teaching practice.

Finally, Table 4 provides evidence that teachers were engaged in co-constructing classroom routines (row 4) and research procedures (row 5). Evidence from all-schools meetings documented how teachers and researchers worked together to construct various procedures. In both meetings and final interviews, teachers also described how their approach to the project was tailored to their respective contexts and/or reflected their contributions. For example, CB's comments reflected her view that teachers were encouraged to take a set of instructional principles and try them on for size: "You can only try it on. You can't impose a teaching style. You can only try it and see if it works for you as well. Or if you think it is effective for students" (CB, 188-190). Similarly, initially CD was worried that teachers would be expected to do things the same way, but was pleased when she was able to adapt procedures to meet her particular needs: "So you don't feel, oh my god I've got to use this structure, and if I can't use this structure I'm going to fail at the whole thing. And that's how I felt at the beginning. And it isn't like that at all because you develop your own ... whatever works for you" (CD, 281-283).

In sum, the data in Table 4 show how teachers and students were learning in parallel. While students were becoming active learners, reflecting on learning processes, teachers were engaged in revising their teaching and reflecting on teaching practices. Similarly, while students were co-constructing strategies with teachers for

completing academic work, teachers were co-constructing procedures with researchers for improving their instruction. Previous research had shown that, for students, SCL instructional processes could be associated with sustained use of the new learning strategies across contexts, tasks, and time (Butler, 1993; 1995; 1998-c). Our hope was that, with a parallel professional development model, we could promote teachers' sustained use of their new teaching strategies and meaningful and long-term instructional change. Of note is that one teacher explicitly recognized the parallel between the SCL approach and the professional development model used in this project. When describing the interaction between teachers and researchers, she stated, "I got the sense that Deb was using SCL on us!" (CF, 62).

### *The Process of Working Collaboratively*

In Table 5, we provide an overview of the collaborative processes used within the first year of the project. Included are descriptions of roles played by researchers in fostering collaborations across and within schools (rows 1 and 2, respectively). Also included are descriptions of teachers' perceptions about opportunities to work collaboratively with colleagues (row 3).

First, of note is how researchers structured opportunities for teachers from different schools to work together (see Table 5, row 1). In the three all-schools meetings, teachers participated with the researchers and district resource staff in what were essentially debriefing and planning sessions. At each meeting, discussion started by brainstorming a list of "successes" and "challenges." To encourage honest discussion of both positive and challenging points, researchers brought up issues that had been raised by teachers during classroom observations (e.g., challenges in completing teacher reflection forms while trying to work with students). Next, participants from different schools were mixed in small groups and had opportunities to share ideas and to problem-solve solutions to challenges. Finally, the whole group reconvened to discuss strategies that had emerged in the small group discussions.

Second, researchers also worked actively with teachers within each school (see Table 5, row 2). At the start of the year, researchers met with teachers for a series of planning meetings. Mini-workshops also were held where teachers had an opportunity to "experience SCL" (as if they were students). Subsequent mini-workshops were held with educational or classroom assistants (EAs), peer helpers, or students (with the aim of introducing SCL as used in that particular school). The bulk of the researchers' professional development support, however, was provided through co-teaching. Throughout the year, the principal researcher co-taught with each teacher for roughly one block every week. Research assistants also visited each school weekly. While the research assistants sometimes co-taught with teachers, their primary role was to assist in co-constructing research procedures and in data collection (e.g., setting up portfolio boxes; revising teacher reflection forms based on teachers' advice; copying students' work samples).

In final interviews, teachers often made comments about the effectiveness of their collaboration with colleagues (see Table 5, row 3). Teachers were positive about opportunities to work collaboratively with control group teachers, educational assistants, other teachers, and students. For example, CB explained: "I liked the debrief sessions that we had with the other teachers. When we did the positives/negatives it really clarified your thinking on what was working and why you were doing it" (57-58). Similarly, TM noted how working together with other teachers was useful to finding approaches for implementing SCL: "I think all four of us are doing it in a slightly different way, so the more people you talk to the quicker you probably find something that can work for you" (187-189). Another teacher was pleased that we involved educational assistants and a youth care worker in the project at her school. When asked what she thought worked well in the project, she

replied, “What worked well was Deb coming in and doing inservice at our school. Involving all personnel” (84-87).

However, teachers also made many a number of suggestions regarding how within-schools collaboration might have been improved. Most frequently, teachers wished that there had been more time and opportunity to work with educational assistants (EAs). For example, LN suggested “making sure that the educational assistants are more familiar with the approach, with more modeling” (87-88). Even in schools where EAs received considerable direction, teachers noted a need for additional assistance. As CD explained, “As head of the department I have a regular meeting once a week with my classroom assistants, and we spent a lot of time discussing that on how to switch that [instructional style] around. They found it very difficult but saw the value of it” (CD, 169-171). Teachers also were disappointed by the inconsistencies between what they were doing with SCL and approaches used across classes (i.e., by teachers in academic classes) or by substitute teachers. This was one of the challenges that teachers identified to implementing SCL effectively (see below).

At the end of the project teachers also described how they were working more collaboratively with *students*. Recall from Table 3 that one of the gains teachers made in the project was a positive shift in their relationship with students. Teachers noted how they were now collaborating with students when providing instruction rather than telling them what to do. One teacher wished that students had been involved more directly in the project, when setting up how the instruction would work. She noted that “there was a lot of communication between the adults, but possibly not enough between adults and kids” (CD, 256-257).

### *Effective Professional Development Activities*

In this section, we describe teachers’ perceptions about the professional development activities used in the project. Table 6 presents teachers’ perceptions of the value of researchers’ support strategies (i.e., co-teaching and mini-workshops). Table 7 presents the qualities of teacher-researcher interactions that teachers felt were important to the success of the project.

When evaluating professional development strategies, teachers focused on two types of activity (see Table 6). One type was the introductory “mini-workshops” done at the start of the project to review SCL instructional principles and/or give teachers first-hand experience with the approach (i.e., as if they were students). The second type was the researchers’ “co-teaching.” In support blocks, where teachers worked individually with students, co-teaching could be further subdivided into its constituent activities (which, when combined, defined co-teaching more broadly). These were: (a) researcher modeling (i.e., a researcher working with a student while a teacher watched); (b) observation and feedback (i.e., a teacher working with a student while the researcher watched); and (c) working directly with students (i.e., with or without teacher observation). During any given co-teaching episode, shifts between constituent activities were dynamic. Nonetheless, teachers’ comments sometimes focused on the benefits or limits of a given constituent of co-teaching (see rows 3, 4, and 5). In the table, bold text is used to represent positive evaluations. Italics indicate suggestions or comments that were negative.

From Table 6, it is clear that all teachers appreciated co-teaching generally or at least one of its constituent activities. Further, most of the italicized evidence represented in rows 1 to 4 represented “wishes”

for more co-teaching, again reflecting the value that teachers placed on this aspect of professional development. The following excerpts illustrate this positive evaluation:

### *Co-teaching Globally*

- ?? “The most useful time for me was when Deb came to McMath and worked with students while I worked with [them].” (LN, 66-67)
- ?? “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 favour.” (LV, 219-220)
- ?? “Watching [Deb] interacting with students and having her give feedback on what I was doing [the most powerful part]. I found it more motivating to have her here.” (LN, 94-96)

### *Modeling*

- ?? “So, I like, when Deb would come in and do a persistent probe with a kid. Well, maybe [the kid] wasn’t doing fine after all. That kind of modeling is very, very helpful.” (CB, 160-162)
- ?? “Continued modeling throughout the year, that really helped. Either to get me back on track with it or a new way of approaching it. To set somebody up in September and then come and collect data in June is not going to work.” (CD, 528-530)
- ?? “When Deb came and showed us how to do SCL, it was the most powerful for me ... To watch her.” (CF, 62-63)
- ?? “I learn better by example, so watching Deb helped me more than the beginning introduction. The introduction is necessary otherwise you don’t have a clue as to what’s coming.” (TM, 64-65)
- ?? “I really like the interaction with Deb. I liked watching her interact with the kids and learning her approach with kids. It gave me time to think about what I’m doing.” (LN, 209-210)
- ?? “It was a nice reminder to have [Deb] come in and if I got stuck, then she’s work with that student and I’d watch. So it was great to have her in.” (TS, 158-159)

### *Observation and Debriefing*

- ?? So, having her sit there and she virtually wrote out what I was saying to students and how I phrased questions and I found that really valuable ... Yes, then I could really see where I was asking the wrong kind of questions or leading questions.” (LV, 64-71)
- ?? “The debriefing sessions were probably the best, when we went over what happened and I had questions on my mind.” (CF, 65-66)
- ?? “Well [Deb] was the expert. And she gave very good feedback. And she contributed to gains in a lot of my students.” (MP, 115-116)

In contrast, response to the mini-workshops was mixed. On the positive side, teachers liked providing introductory workshops to other school personnel (e.g., EAs), as a way to bring them into the project. Also, TM felt that the initial mini-workshop was useful if just to get a sense of what was upcoming (see above). Another teacher mentioned that she liked being engaged in SCL as a student: “So, when [Deb] made us go through it [SCL] as students then it was ‘oh I get it now!’” (TS, 126). But other teachers questioned the efficacy of providing “mini-workshops,” either for EAs or for themselves (consistent with our expectations). For example, LV said, “I felt that her introduction at the first session wasn’t very powerful in that it didn’t really, it was the old style of didactic explanation of information instead of showing a different way. I just felt that there was something missing there” (LV, 91-93). In contrast, LV was very supportive of all of the co-teaching activities (see Table 6). Similarly, TS contrasted the mini-workshops with the effectiveness of co-teaching: “I think I remember Deb came in and talked about it and gave a bunch of paperwork. Then she came in a second time to explain how to do it ... I got confused the first time, and then she came in and did it and it made sense” (TS, 112-116).

Note that teachers in the project did tend to describe the principal researcher as an “expert,” particularly in terms of how to interact with students using the SCL approach. But, it is important to note also

that teachers only granted this expertise to the researcher *after* they had observed her working with students in classrooms. Thus, it was not by virtue of her formalized knowledge or University position that teachers accepted Deb as an “expert.” Instead, it appeared that she gained credibility with teachers because of her ability to contextualize formalized knowledge in tandem with her practical expertise in working with students.

Table 7 presents the qualities of teacher-researcher interactions that teachers found most valuable. A few teachers valued that the researchers were flexible and collaborative. For example, CF explained that “the way Deb worked with us in understanding this was really collaborative” (90), while MP felt that the researchers were “wonderful with your flexibility and you were very good to the students” (232). Teacher’s also appreciated researchers’ availability. For example, EH said, “You asked us for our feedback all through the year ... we could have said at any point ... well we should do this ... it was available all the time” (171-172). Somewhat troubling, if not surprising, was teachers’ perception that researchers’ presence also was motivating and kept them on track with the project. For example, teacher comments included:

- ?? “I might have lost interest in the project without [Deb’s] on-going influence.” (LN, 98-99)
- ?? “I think without the kind of on-going in class support that Deb could give us, I think they’d [other teachers trying SCL] try it once or twice and give up. That’s my guess. Because it is a shift in thinking and a shift in a whole ideology towards education.” (LV, 127-131)
- ?? “If she hadn’t been there to ... I don’t think it would have gone. Also, when she comes in it shows that this is something real to the students.” (EH, 259-262)
- ?? “For me it’s most effective when you guys are here on a regular basis, because it’s a prompt for me and a lift for me to really say, ‘oh yeah, let’s really get into it and get going and be consistent.’” (CB, 58-60)
- ?? “Somebody would have had to show me what to do and without this, the project wouldn’t have worked for me. Her [Deb’s] enthusiasm carries you through.” (CF, 96-98)

On the one hand, the finding that researcher presence was important to sustaining momentum for teachers was not particularly surprising. In fact, it was expected that teachers would need on-going support to effect meaningful changes in practice. Making conceptual shifts is a long-term, complex endeavor that requires teachers’ re(construction) of knowledge built through reflection on emerging experiences. Further, in teachers’ busy lives, keeping focused on a major change effort requires structure and support. Thus, from the start we were aware that our goal was to establish and evaluate a structure supportive of long-term change. If successful, the approach could serve as a model for districts seeking to support teachers’ professional development (e.g., by fostering cross-school communities of practice facilitated by district resource personnel).

On the other hand, this finding is potentially troubling. If “outsiders” act as the motivators for sustained change, then long-term use of a new model is unlikely. Fortunately, some evidence suggests that by the end of the first year teachers were integrating SCL into day-to day practice. Indeed, the kinds of insights and concrete benefits that teachers described gaining were indicative of meaningful change (see Table 3). Further, some teachers explicitly described how even research procedures had become merged into practice. For example, TS explained, “The reflection forms kept me on task sort of thing. After a while I didn’t think of it as a [research] thing, but my thing because I incorporated it right into the class and everyone knew I’d be coming around to check their sheets and agendas every day” (206-209).

### *Barriers, Challenges, and Limitations*

All teachers identified challenges to implementing SCL and making changes within their classrooms (see Table 8). These could be broken down into two broad categories. In the first, teachers focused on how the needs, characteristics, behaviours, or attitudes of students undermined their ability to use SCL (see rows 1 to 5). The most frequently cited of these barriers was students' resistance to a shift in approach (see row 2). In some cases students were used to a certain way of doing things and so were resistant to new expectations (e.g., to think things through for themselves). CD explained: "It was the older kids, the grade 10's and 11's who are in such a learning ... rote routine. It's very hard to change it at this stage of their life." (96-102). Other students lacked the maturity to take control of their learning. In either case, as TS aptly noted, "If you're resistant to it, then it's not going to work" (82-83). Also common was teachers' perception that SCL would not meet some students' needs. Teachers explained that some students had basic needs that had to be met before SCL could work (row 1). For other students, teachers thought that, given their characteristics, they would not have profited from SCL (row 4). For example, LV stated, "there were some I didn't use it with because they couldn't have grasped it - low incidence students - who couldn't take that kind of initiative" (40-41). Teachers also noted that some students needed considerable support and encouragement to take ownership over their learning (row 3). One teacher was concerned that students did not follow through with SCL as intended, which undermined their success (row 5).

The second broad category of challenges described by teachers were a result of factors within teachers, classrooms, or schools (see rows 6 to 11). As noted earlier, one challenge was that approaches used across school personnel (e.g., teachers, EAs, substitute teachers, teachers in academic classrooms) were inconsistent and so undermined SCL (row 6). Another challenge was finding a balance between meeting students' immediate needs (e.g., get this worksheet done for next block) and promoting more independent approaches to work (row 7). Five teachers described how it was hard to find enough time to sit down within individual students given workload demands and the pace of the curriculum (row 8). As CB succinctly explained, "We're swamped" (158). Teachers also mentioned challenges in sustaining momentum and consistency over time (row 9) or with teaching mixed groups of students (row 10). Finally, teachers sometimes felt that, because they were just learning the method themselves, they were not as effective as possible (row 11). As EH explained, "I have to say I haven't done it as ideally ... as perfectly as I have seen you or Deb ... when you were in here doing it with the students. So it wasn't like they gained as much as if that were the case."

In sum, in final interviews and all-schools meetings, teachers identified student- and school-centered factors that made implementing a new instructional practice challenging. Indeed, teachers did not hesitate to describe the challenges they were facing as they tried to implement the approach. But, rather than acting as an obstacle to teachers' participation in the project, we found that teachers were easily and willingly involved in problem-solving solutions to challenges. In fact, a primary focus in the all-schools meetings, and in the weekly school visits by researchers, was to provide opportunities for teachers to honestly describe problems and then to trouble shoot solutions collaboratively (see Table 5). In this context, it is notable how some of the "gains" teachers described (see Table 3) represented solutions to the challenges identified here. Recall, for example, that teachers reported developing better strategies for managing instructional time (so as to make the time to work individually with students). At the final all-schools meeting, teachers described how they were better able to analyze their tasks as teachers (e.g., "working with 5 students simultaneously in a resource block"), and that they "became more focused as students were able to function more independently" (AS3, 177). Teachers also described how they had developed systems to balance short-term and long-term goals. Thus, when considered comprehensively, evidence suggests that teachers had opportunities to both identify *and overcome* obstacles.

But without continuous support and open discussion, teachers' early efforts to make changes in practice may easily have been derailed.

Just as teachers were encouraged to identify barriers and challenges to implementing SCL, they were also encouraged to identify barriers and challenges to instituting research procedures (see Table 9). The top portion of Table 9 presents a summary of challenges (see rows 1 to 7), such as finding the time to complete teacher reflection forms without taking time away from students (row 3). For example, CB stated, "My concern is now that the time that I put on writing those up takes away from the time to get the kids writing on theirs" (113-116). But as argued above, evidence also suggests that most teachers were successful in finding ways to work around or overcome challenges (see rows 8 to 11). For example, most teachers ultimately judged teacher reflection forms to be useful (row 8) and/or found ways to make the forms work (row 9). As CB explained, when asked if improvements could have been made to research procedures, "No, I think the fact that the research process has been field-tested in enough places that we've worked out something that works even though we're not all doing it the same way" (68-69). In the following excerpt, note how EH raises a concern about reflection forms, but then immediately suggests a solution: "For me, personally, just keeping the forms. I think I'm just going to put it all in one clipboard, rather than separate duo-tangs, which at first I thought, well, OK, then they are in the exact spot where I'm going to sit with the students" (333-336). The following excerpts illustrate how at the end of the project teachers described reflection forms as individualized and/or valuable:

- ?? "I like the format that I can run through my computer." (TL, 149)
- ?? "Well, what kept me focused was the daily sheets we filled in. That's just me, but I like to record things and then get feedback on the way I was doing things helped me a lot." (TM, 79-80)
- ?? "The writing down on the sheets for each student [teacher reflection forms]. It not only helps with SCL but it also helps with writing the anecdotal report comments because you can just to back and see this kid did this ...It's really neat." (TM, 127-133)
- ?? "[Teacher reflection forms] were good. I think they [might need a little more space for working on the strategies ... like the middle part. Sometimes I would cross off the other parts and just ... keep writing. So that might be a bit bigger." (EH, 319-321).
- ?? "I kind of individualized it a little bit by putting the strategy sheets in the front of the duotang and just referring to the strategy number so we didn't have to right it out a bunch of times. So, I would write, so and so used strategy number seven today" (107-110).

## Conclusions

This paper evaluates the elements of a collaborative research project in which teachers and researchers worked together in communities of practice to situate instructional principles and evaluate benefits for learners. Based on systematic qualitative analyses of teacher interviews and minutes from all-schools meetings, it is possible to conclude that both students and teachers benefited from participating in this project (see Tables 2 & 3). Further, both teachers and students were engaged in active reflection on teaching and/or learning processes (see Table 4) that could be associated with the gains that they made (e.g. insights into teaching for teachers; self-direction and independence for students). Evidence also suggests that teachers were engaged in collaboration both within and across schools (see Table 5), with colleagues and with researchers (see Tables 5 through 7). As expected, it also appears that sustained support for teachers' revisions of and reflection on practice were essential to effecting meaningful change (see Table 6). Also, a motivating structure, whether provided by researchers or peers, is essential to sustaining teachers' momentum (see Table 7). Finally, it was clear that contextualizing a new instructional model was for teachers a bit of a bumpy road (see Table 8). But when

teachers were involved in collaborative problem solving (see Table 5), they were able to develop individualized approaches to teaching and research that circumvented or overcame many challenges (see Tables 8 and 9).

This project serves to support several of the theoretical principles advanced in a “communities of practice” framework (Palincsar et al., 1998; Perry et al., 1999). For example, in this project, teachers emphasized that the introductory in-service workshops (as examples of “top-down” descriptions of practice) would not have been enough to effect meaningful change in their classrooms (Borko & Putnam, 1998; Perry et al., 1999). What was required instead were on-going opportunities for teachers to co-construct knowledge and revise conceptual frameworks through reflection on new experiences (Palincsar et al., 1998). Teachers appreciated opportunities to collaborate with colleagues both within and across schools. In that context, they profited from opportunities to share ideas and to problem-solve challenges (Englert & Tarrant, 1995; Perry et al., 1999). Teachers also appreciated opportunities to share expertise with researchers (Henry et al., 1999; Perry et al., 1999). They valued the combination of practical and formalized knowledge researchers contributed, but only because they could see the immediate relevance of theory in the classroom.

Also consistent with newer professional development models, teachers in this project enjoyed identifying “new ideas” (i.e., “best practices”), enacting changes in their individual classrooms (with guidance), and reflecting on their teaching activities (Henry et al., 1999; Palincsar et al., 1999; Perry et al., 1999). These experiences appeared to foster teachers’ (and researchers’) co-construction of both practical and formalized knowledge related to effective teaching practices. Teachers’ development of practical knowledge was evidenced by their emerging insights related to teaching styles and/or effectiveness (Table 3). Their development of formalized knowledge is being demonstrated in their participation with researchers in presenting findings at conferences (e.g., for the Council for Learning Disabilities in 2000; for the International Conference on Teacher Research in 2001) and/or within collaborative writing projects.

In conclusion, it appears that the professional development model used in this project is on the way to promoting “deep rooted” changes in practice. These changes are based on teachers’ instantiation in practice of new decision making criteria, as opposed to mastery of specific routines (Gersten et al., 1997; Palincsar et al., 1998). However, determining the success of this project will require evaluating teachers’ sustained use of a new instructional model once the formal “research” project is over. In spite of positive indications that teachers were merging new ideas with on-going practice, they also identified the presence of researchers as essential to sustaining momentum. Follow-up research (underway) is clearly required to determine how, when, and why teachers’ changes in practice become self-sustaining.

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Table 1. The Final Set of Codes Used to Categorize Data from Teacher Interviews and All-Schools Meetings

Major Code	Subcode Level 1	Subcode Level 2
People working together within the school district	Within Schools  Across Schools	Involving Educational Assistants (EAs) Involving Peer Tutors Involving Students Involving Control Teachers Teaching Working Together  Teachers District Personnel
Teacher-Researcher Interaction- Quality	Availability Flexibility Motivator (helps to keep on track) Reinforces importance of project/method Collaborative	Across time (for any level 1 codes)
Teacher-Researcher Interaction- Process	Mini-workshops (within schools)  Co-teaching  Observation (RAs)	With teachers With Students With EAs With Peer Tutors With Substitute Teachers  Modeling Watching/Debriefing/Feedback Working Directly with Students Collaborative Problem Solving (if stuck) Across Time  Administrative Support Data Collection
Teacher Learning- Process	Active Reflection (explicit statements of thinking) Learning Curve/Over Time Knowledge Construction	
Teacher Learning- Outcomes	Insights Into:  Concrete Benefits	Teaching Style & Philosophy Teaching Effectiveness Students/Students' Needs Personal Relationship with Students  Teaching practice (skills & practices) Ideas Class routines
Research Procedures	Materials/Articles Record-Keeping Motivator-Materials/Records Keep on Track Video Co-construction Merged into Practice Questionnaires Individualized	Individualized (across any level 1 codes) Co-Construction (across any level 1 codes)

...table continues

Table 1. (Continued)

Major Code	Subcode Level 1	Subcode Level 2
Using SCL	SCL "In action/"How" Co-construction Merge into Practice (explicit statements) Individualized Strategy Sheets	Individualized (across any level 1 codes)
Student Learning- Process	Active Reflection (thinking or reflecting)  Working Together/Sharing	
Student Learning- Outcomes	Confidence Understand Task Demands Self-direction/Independence Self-awareness Strategies (good strategies)	
Barriers or Limitations	To using SCL To working Together To research Procedures To training  Personal Factors (NOT specific to SCL/project)	Teachers Perceive Selves as Barriers Maintaining Motivation Time Pace of Curriculum Funding Inconsistencies in Approaches with Students Student characteristics (e.g., teachers' Perceptions of Students as not suitable for SCL) Student resistance Systems or School routines  Students Teachers

Table 2. Teachers' Perceptions of Outcomes for Students

	MP	LN	CF	TL	CB	LV	TS	TM	CD	EH	AS1	AS2	AS3
Improved confidence		13-15 17-19	14-19		132-5			47-8			85	129	
Better awareness of task demands		13-15 17-19 33-35		42-3 216-17 236-38									
Better strategies	214-19		21 24-25 108-9 214-18	28-30 36-39 51-54	206-13					13-16	95	129	
Self-awareness		21-25				9-18			10-11		85		
Independence, ownership or control, self-direction		150-51	14-19 29-32 49-51	13-15 19-22 248-50		9-18		8-11 40-42	75-78	13-16	85 93 102	100 101 129	129 177
General positive outcomes (e.g., good progress)		47-50	34-9	51-54 78 205 238			90-91	8-11					179
TOTAL	X	X	X	X	X	X	X	X	X	X	X	X	X

**Notes:** "Pseudo-initials" represent teacher participants; AS# = the first, second, or final all-schools meeting; table entries correspond to the referent for a piece of evidence included in the table (e.g., MP 214-19 = lines 214-219 from MP's final interview); X indicates the columns for which there are entries for at least one teacher.

Table 3. Teachers' Perceptions of Outcomes for Themselves

	MP	LN	CF	TL	CB	LV	TS	TM	CD	EH	AS1	AS2	AS3
Concrete benefits for practice			71-73 74-75 146-51 163 189-90	158 235	108-09 172-74		206-09	127-33 199-201	200-01 464-68 650-53		85 102 103	129 145	177
Improved relationships with or understanding of students	214-19	41-42 190-92 192-95 200-04	172-73 174-77	248-50				15-19	10-11 46-48 211-13 658-63		85	129	175 176
Insights into teaching style or effectiveness	224-28	209-10	74-75 189-90 194 214-18	196-98 238	58-60 95-98 188-90 194-201	60-64 64-71 224-28		52-53 193-195	668-69	513-18 537-38	91	129	173
Statements of value of SCL components or approach	179-83 214-19 224-28	190-92 192-95	108-09 181-83 189-90 194 201 214-28	196-98	194-201	60-64 64-71 224-28		52-53 193-195	668-69		85 91	129	173 176
<b>TOTAL</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

Notes: "Pseudo-initials" represent teacher participants; AS# = the first, second, or final all-schools meeting; table entries correspond to the referent for a piece of evidence included in the table (e.g., MP 214-19 = lines 214-219 from MP's final interview); X indicates the columns for which there are entries for at least one teacher.

Table 4. Teacher and Student Learning Processes in SCL Classrooms

	MP	LN	CF	TL	CB	LV	TS	TM	CD	EH	IM	AS1	AS2	AS3
Students were thinking actively about how they were learning		13-15 17-19	21 24-25 49-51 214-18	19-22 28-30 36-39 41-43 135-36 216-17 236-38	206-13	9-18 138-41			564-70 642-46	13-16		84	129 138	164 173
Teachers were thinking actively about their own practice	214-19 224-28	119 200-01 209-10	62 115 116-17	158 196-98 222-28 235	57-58 172-74 188-90 194-201 206-13		126		332-33 397-401 658-63	381-84 513-18 545-46 550-56				
Learning to use SCL takes time (it was a learning process for teachers)				85				199-201	281-83 331-32 528-30 537-39 564-70 634-37 691-92	545-46		84 85	106 129	164
Teachers co-constructed SCL classroom routines and/or made SCL their own			150-52 170-71		68-69			187-89	281-83 435-40 564-70 617-19			89 114	90 129 137 138 142	
Teachers co-constructed research procedures with researchers or other teachers		80-82 123-24	79-81 116-17	143 149	68-69	163-66	177-81	84-85 107-10	211-13 464-68	319-21	34 116	85	142	182 183 184 186 191 193 202 223
TOTAL	X	X	X	X	X	X	X	X	X	X		X	X	X

Notes: “Pseudo-initials” represent teacher participants; IM = the Introductory Meeting; AS# = the first, second, or final all-schools meeting; Table entries correspond to the referent for a piece of evidence included in the table (e.g., MP 214-19 = lines 214-219 from MP’s final interview); X indicates the columns for which there are entries for at least one teacher.

Table 5. Overview of Collaboration Within and Across Schools

I.	All Schools Meetings	<p>? ? Teachers, researchers, and district personnel met together across schools four times in the first year (Introductory Meeting (IM), AS1, AS2, AS3)</p> <p>? ? Started by brainstorming successes and challenges  — related to implementing SCL  — related to research goals and procedures</p> <p>? ? Participants met in small groups to share ideas and problem-solve (AS1 87, AS2 133, 141; AS3 164)</p> <p>? ? Participants shared ideas and problem solved with the entire group (AS1 84, 94, 97; AS2 109, 129, 136, 138, 144, 145; AS3 164)</p>
II.	Within Schools	<p>? ? Researchers met with teachers as a group for mini-workshops &amp; planning  — 2-4 meetings at the beginning of the project  — 1-2 meetings throughout the year</p> <p>? ? Mini-workshops with Educational Assistants at 3 out of 4 schools</p> <p>? ? Mini-workshops with peer tutors at one of the schools</p> <p>? ? Mini-workshops with students at 3 out of 4 schools</p> <p>? ? Attendance at parent-teacher conferences at 1 of 4 schools</p> <p>? ? Regular classroom visits by researchers (approx. once per week per class)  — on-going professional development and co-teaching  — data collection and collaboration on research procedures</p>
III.	Teacher Perceptions of Collaboration with Colleagues from Final Interviews	<p>? ? With control group teachers  — positive about what was done (LN 136)  — wish it had been done more (MP 16-21; TL 178-183)</p> <p>? ? With EAs  — positive about what was done (CD 169-71; LV 106-10; MP 14-15, 84-7; AS1 85)  — needed to be done more (CD 165-9; CB 77-9; CF 86-7; EH 223-27; LN 87-8; TS 143-46, 151-2; AS3 193)</p> <p>? ? With peer tutors  — wished it had been done more (EH 223-27)</p> <p>? ? With other teachers  — positive about opportunities (CB 57-58; TM 187-89)  — wish it had been possible to share ideas more (CF 170-71; MP 179-183, 208-209)  — inconsistencies with substitute teachers (LV 106-110; AS1 97)</p> <p>? ? With the students themselves  — positive about changed relationships or opportunities for discussion (CD 211-3, 397-401, 658-663; CF 71-3, 74-5; LV 224-8, MP 225-28, AS1 85; AS2 129; AS3 175).  — wished students had been more involved (CD 256-57)</p> <p>? ? Across Classes  — wished there had been more consistency (AS1 85, 129)</p>

Table 6. Teachers' Perceptions of The Relative Benefits Associated with Various Professional Development Activities

	MP	LN	CF	TL	CB	LV	TS	TM	CD	EH
<u>Co-teaching</u> <b>Positive</b>  <i>Wish/Limit</i>		<b>31-32</b> <b>66-67</b> <b>94-96</b>	<b>172-73</b>			<b>219-20</b>	<b>158-59</b>		<i>165-69</i>	<b>248-51</b>
<u>Modeling</u> <b>Positive</b>  <i>Wish/Limit</i>		<b>94-96</b> <b>209-10</b>	<b>62-63</b>		<b>160-62</b>	<b>219-20</b> <b>528-30</b>	<b>101-02</b> <b>136-37</b> <b>158-59</b>	<b>64-65</b> <b>181-83</b>	<b>226-28</b>  <i>143-48</i>	
<u>Observation with Feedback</u> <b>Positive</b>  <i>Wish/Limit</i>	<b>115-16</b>	<b>94-96</b>	<b>65-66</b>	<b>88</b>  <i>111-12</i>		<b>64-71</b> <b>75-77</b> <b>219-20</b>  <i>58-60</i>	<b>57-58</b>	<b>52-53</b>	<b>369-71</b> <b>617-19</b>  <i>369-71</i>	
<u>Directly working with students</u> <b>Positive</b>  <i>Wish/Limit</i>	<b>115-16</b>	<b>31-32</b> <b>209-10</b>	<b>172-73</b>		<b>132-35</b>	<b>118-21</b>	<b>83-86</b> <b>90-91</b>	<b>71-74</b> <b>181-83</b>	<b>226-28</b>	
<u>Mini-workshops</u> <b>Positive</b>  <i>Wish/Limit</i>	<b>84-87</b>					<b>106-10</b>  <i>84-85</i>	<b>126</b>  <i>91-93</i>	<b>64-65</b>	<b>226-28</b> <b>339-45</b> <b>397-401</b>  <i>226-28</i> <i>339-45</i>	<b>196-99</b>

Notes: "Pseudo-initials" represent teacher participants; Table entries correspond to the referent for a piece of evidence included in the table (e.g., MP 214-19 = lines 214-219 from MP's final interview).

Table 7. Teachers' Perceptions of the Quality of Teacher-Researcher Interactions

	MP	LN	CF	TL	CB	LV	TS	TM	CD	EH
Available			96-98	123	58-60 95-98				314-16	171-72 248-51
Collaborative			90							171-72
Flexible	232									
Motivating		94-96 98-99	96-98	121-23	95-98	118-21 127-31	158-59 206-09	71-74	528-30	259-62
TOTAL	X	X	X	X	X	X	X	X	X	X

Notes: "Pseudo-initials" represent teacher participants; Table entries correspond to the referent for a piece of evidence included in the table (e.g., MP 214-19 = lines 214-219 from MP's final interview); X indicates the columns for which there are entries for at least one teacher.



Notes: “Pseudo-initials” represent teacher participants; AS# = the first, second, or final all-schools meeting; Table entries correspond to the referent for a piece of evidence included in the table (e.g., MP 214-19 = lines 214-219 from MP’s final interview); X indicates the columns for which there are entries for at least one teacher.

Table 9. Barriers, Limitations, and Challenges to Implementing Research Procedures.

	MP	LN	CF	TL	CB	LV	TS	TM	CD	EH	AS1	AS2	AS3
Students providing consent in control groups	16-21												
Extra work for students (portfolios, questionnaires)	8-9							120-21					
Extra work for teachers (e.g., teacher reflection forms)		123-24	107						458-59 464-68	289-90 333-36		129 142	
Questionnaires a problem or not meaningful to students	8-9						160-63						
Needed examples of how to complete forms		80-82											
Keeping systems organized or finding systems that worked for them							177-181			333-36			
<b>TOTAL</b>	X	X	X				X	X	X	X		X	
But teachers also liked the teacher reflection forms and felt they were useful				121-23		138-41	206-09	79-80 127-33 181-83		319-21			
Teachers found individualized systems for making the TRFs work				149	68-69	163-66	177-81	107-10 187-89	211-13 464-68		94	142	
Teachers liked materials and/ or support from research assistants	96-97	130-31	108-09 133-34	121-23 143			130 206-09	79-80 127-33 181-83		193-99 319-21			
<b>TOTAL</b>	X	X	X	X	X	X	X	X	X	X	X	X	

**Notes:** “Pseudo-initials” represent teacher participants; AS# = the first, second, or final all-schools meeting; Table entries correspond to the referent for a piece of evidence included in the table (e.g., MP 214-19 = lines 214-219 from MP’s final interview); X indicates the columns for which there are entries for at least one teacher.