Mentoring Student Teachers to Support Self-Regulated Learning

Nancy E. Perry

Lynda Phillips

Lynda Hutchinson
University of British Columbia

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Abstract

We use the term "self-regulated learning" (SRL) to describe independent, highly effective approaches to learning that are associated with success in and beyond school. Research has indicated that fostering SRL in elementary school children requires a level of instructional sophistication and student awareness that may be beyond the capabilities of beginning teachers. This article presents findings from the first 2 years in a 4-year investigation of whether and how highly effective, high-SRL teachers in a large, diverse, suburban Canadian school district can mentor student teachers to design tasks and develop practices that promote elementary school students' SRL. Across Years 1 and 2, 37 student teachers were paired with 37 mentor teachers in grades K–5 in a cohort that emphasized SRL theory and practice. In general, student teachers remained with the same mentors throughout their yearlong teacher education program and were supported by faculty associates (teachers seconded by the university to supervise student teachers' practice) and researchers who also had expertise in promoting SRL. Researchers observed mentor and student teachers teaching, videotaped professional seminars, and collected samples of student teachers' reflections on teaching, lesson plans, and unit plans. The observational data, which are the focus of this article, indicated that many student teachers were capable of designing tasks and implementing practices associated with the promotion of SRL. In general, student teachers' tasks and practices resembled those of their mentors, and the complexity of the tasks that mentors and student teachers designed was strongly predictive of opportunities for students to develop and engage in SRL.

In their 1988 article for the *Elementary School Journal,* Rohrkemper and Corno wrote, ". . . classroom learning inevitably requires adaptive responses on the part of students. Teachers cannot and should not engineer tasks to try to prevent this, for the

experience of modifying either tasks or themselves to cope with the stress of classroom demands allows students to learn to respond flexibly and to assume control over their own learning" (p. 297). Since then, volumes have been written about the need for students to develop skills and attitudes that will enable them to engage in intentional, self-regulated learning (SRL) to prepare for life and work in the twenty-first century (see, e.g., *Handbook of Self-Regulation,* 2000; and special issues of *Educational Psychologist,* 1990, 1995, 2002; *Teachers College Record,* 2004; and *Theory into Practice,* 2002).

We use the term "self-regulated" to describe learners who are metacognitive, intrinsically motivated, and strategic (Winne & Perry, 2000; Zimmerman, 1990). Self-regulated learners are aware of their academic strengths and weaknesses and strategies they can use to meet the demands of challenging tasks in classrooms. They believe that ability is incremental, focus on personal progress and deep understanding, have high efficacy for learning, and attribute outcomes to factors they can control (e.g., effective use of strategies). Finally, when faced with a challenging task, they choose from a repertoire of tactics and strategies those they believe are best suited to solving the problem at hand and apply them appropriately. In the words of Rohrkemper and Corno (1988), self-regulated learners are adaptive learners, able to modify tasks or themselves to cope with the stresses of classroom learning.

Over the past quarter century, research on self-regulation and self-regulated learning has indicated, overwhelmingly, that SRL is desirable; the ability to effectively manage one's learning leads to success in and beyond school (McCaslin & Good, 1996; Rohrkemper & Corno, 1988; Zimmerman & Bandura, 1994). Unfortunately, research also has demonstrated that a significant minority of learners, across a wide range of ages and contexts, are not ideally self-regulating (Winne, 2003). They struggle to construct accurate representations of a task's demands and lack the knowledge and skills they need to effectively manage their learning. Moreover, Perry's work with teachers indicates that most teachers share the goal of helping students to become independent and academically effective learners, but they are unsure of how much and what kinds of support students need to attain it. As a result, in many classrooms, students are not being taught habits and strategies for self-regulating learning, nor are they receiving informative feedback about their own attempts. Finally, many students are motivated by extrinsic rewards, such as grades or praise from the teacher, and social comparisons, such as being the best, or worst, in the group (Pintrich & Schunk, 2002). For some students these rewards act as incentives to work harder. For others, especially when the evidence points to failure, focusing on extrinsic rewards can lead to low efficacy for learning and the adoption of defensive (Paris & Newman, 1990) and self-handicapping (Covington, 1992) strategies. These students may try to avoid failure and damage to self-esteem by choosing easy tasks, procrastinating, and avoiding work altogether, tactics that actually curtail opportunities to practice and perfect effective forms of SRL.

For these reasons, we believe efforts to help teachers design tasks and interact with students to promote SRL are warranted. Research has indicated that children develop academically effective forms of SRL when they are involved in (*a*) working on complex, meaningful tasks; (*b*) making decisions about their learning processes and products and the criteria by which these are judged; (*c*) working collaboratively with and seeking feedback from peers; and (*d*) evaluating their own learning (Many, Fyfe, Lewis, & Mitchell, 1996; Perry, 1998; Turner, 1995). Furthermore, research has shown that teachers in these high-SRL contexts support students in ways that are instrumental to SRL. They ensure that students acquire the domain and strategy knowledge they need to operate independently, make

appropriate choices, and expand their abilities by attempting challenging tasks (Perry, 1998; Perry, VandeKamp, Mercer, & Nordby, 2002; Wharton-McDonald et al., 1997). They guide rather than direct students' learning and use nonthreatening evaluation practices that encourage students to focus on personal progress (vs. besting peers or impressing the teacher) and to view errors as opportunities to learn.

In contrast, in classrooms where tasks target specific skills apart from meaningful applications (e.g., punctuating sentences apart from composition) and offer students limited opportunities to make choices, control challenge, or evaluate progress, children have few opportunities to develop SRL and are more likely to adopt defensive and self-handicapping approaches to learning (Perry, 1998; Turner, 1995). In these classrooms, support from teachers often targets the procedural aspects of tasks rather than the construction of meaning or strategic learning. Challenge and criteria for evaluation are more likely controlled by the teacher and the same for all students, making social comparisons salient.

Working with Teachers to Promote Self-Regulated Learning

Perry and colleagues have used insights from research to develop a framework for helping teachers design tasks and interact with students in ways that encourage SRL (Perry et al., 2002; Perry, Walton, & Calder, 1999). The framework supports teachers to design and implement instruction about SRL that is tailored to their unique teaching and learning contexts (Duffy, 1997; Randi & Corno, 2000). In the framework, teachers are inventors, decision makers, and problem solvers. Consistent with sociocultural views of learning and participatory models of teacher development (Lave & Wenger, 1991; Palincsar, Magnusson, Morano, Ford, & Brown, 1998), teachers come together as a community of skilled professionals, identify goals for themselves and their students, design and implement activities that address those goals, and monitor and evaluate their progress toward the attainment of their goals, all with the guided and sustained support of teacher and researcher colleagues (Borko & Putnam, 1998). In short, the framework invites teachers to develop their own self-regulation as they teach and model SRL for their students.

In Perry's studies with practicing primary (kindergarten through grade 3) teachers (Perry & VandeKamp, 2000; Perry et al., 1999), the community met one afternoon each month. Five activities guided teachers' interactions during those meetings. First, teachers spent 10 minutes writing about what they had been thinking or trying to implement since their last meeting. Then, during "air time," each teacher spoke for 2 minutes about his or her writing or other classroom events and teaching issues that occurred to the teacher as others talked. When teachers spoke, their colleagues did not interrupt except to ask for clarification. They did not evaluate or offer advice. The goal was to create a forum where, in the words of Lave and Wenger (1991), all contributions were valued and the cost of errors was small. A focus-group discussion followed air time. Topics for the focus group typically arose out of issues raised at previous meetings. During these discussions teachers examined their beliefs and understandings about young children's (kindergarten through grade 3) learning more critically and considered how those beliefs and understandings were manifest in their practices. Also, the researchers provided information about current research on practices that promote metacognition, intrinsic motivation, and strategic action, and teachers considered how they did or could incorporate such practices in their repertoire of teaching strategies. Next, teachers engaged in work time, planning changes to their current practices by working individually, in pairs, and in small groups. Each meeting ended with "reporting out." During this activity teachers made commitments to one another to experiment with new strategies

in their classrooms and to report the results of these experiments at their next research meeting. Often, these experiments became the content of the free-write and air-time activities at subsequent meetings.

To evaluate the efficacy of this framework for teacher development, the researchers (Perry & VandeKamp, 2000; Perry et al., 1999) collected and analyzed copies of teachers' free writes, innovations, and samples of students' work. They videotaped group discussions, observed in classrooms between meetings, and interviewed teachers individually. Their analyses of these artifacts clearly indicated that teachers valued the approach to teacher development and learned from their colleagues (e.g., how to involve students in self-evaluation, how to foster metacognition about reading and writing). Significantly, the data also indicated that changes teachers made to their teaching practices enhanced their students' development of SRL (Perry & VandeKamp, 2000).

Expanded Project

Here we focus on the first 2 years of a 4-year project that expands Perry's work with practicing teachers to investigate whether and how student teachers can be mentored to design tasks and develop practices that foster elementary school (grades K–5) students' SRL. This work seeks answers to three questions: How much experience and expertise are needed to create high-SRL environments? (Can beginning teachers, with all they are learning about the profession, manage the complex teaching task of promoting SRL?) How is such expertise acquired? And how expert does instruction about SRL need to be to improve students' learning? Data from Years 1 and 2 of the project offer evidence concerning the first two of these three questions.

Traditionally, teacher education programs have done little to foster self-regulated approaches to teaching or the teaching of self-regulation. In fact, many programs promote "teacher-proof" materials and train teachers to be followers instead of innovators and entrepreneurs (Duffy, 1997). In addition, research has indicated that prospective teachers' beliefs about teaching and learning are influenced in large measure by their experiences in schools as students and, later, student teachers (Alexander, Murphy, & Woods, 1996; Clarke & Riecken, 2000; Duffy, 1997). If those experiences do little to foster an awareness and application of SRL, they are not likely to develop teaching practices that promote it. Finally, research has shown that teaching SRL is not easy and that the student-centered approach to teaching that characterizes high-SRL environments may require expertise that is beyond what student teachers can reasonably be expected to achieve in 1 year of teacher preparation (Alexander et al., 1996; Brown & Campione, 1994; Whitaker, 2000). According to Brown and Campione (p. 230), teaching SRL requires awareness concerning the needs of students and knowledge and effective use of some sophisticated teaching strategies. Teachers must be sensitive to students' zones of proximal development, knowing when to intervene in learning and when to allow students to solve problems independently. Teachers who are highly effective in this regard scaffold students' learning processes and foster forms of disciplined inquiry that students may not reach without such expert guidance.

According to Fuller and Bown (1975), teachers move through three stages of development in their early years of teaching. In the first stage they are focused on survival concerns. They question their adequacy as teachers and their ability to meet the procedural demands of the job. In the second stage they become more interested in what they are teaching and have more clearly articulated goals for their students. It is not until the third and final stage that they are able to focus on the needs of their students, to assess the extent to which their goals for their students are reasonable and adapt their instruction to address the individual needs of students in their class-

rooms. Whitaker (2000) found support for this model in her research with beginning special education teachers and their mentors. In addition, her observations of the support mentors provided to these novice teachers in their first year of teaching indicated that mentors tended to provide support of an emotional and personal nature and support for the mechanical aspects of teaching but not support that focused on the needs of students. Could it be that beginning teachers do not move to stage 3, student-centered teaching, in their first year of teaching because they are not supported to do so?

Our research asks whether student teachers can develop practices associated with SRL when they receive explicit instruction and intensive scaffolding for doing so in their teacher education program. The predominant way in which we support student teachers' development of high-SRL practices is by (*a*) pairing them with mentors who share our goal of promoting SRL and (*b*) supporting the development of effective mentor-student teacher relationships within the cohort. Qualities of effective mentoring relationships include communicating regularly and fully, sharing teaching interests, being able to serve as a role model, and having time emotionally as well as professionally to invest in the relationship (Rymer, 2002; Whitaker, 2000). Research has indicated that effective mentoring increases beginning teachers' confidence and competence as well as the likelihood that they will remain in the profession (Ralph, 2000; Whitaker, 2000). Also, research has demonstrated that teachers who mentor newcomers to the profession benefit from updating knowledge about research and theory, reflecting on existing practices, trying new strategies, and collaborating with other professionals (Zachary, 2002). However, successful mentoring relationships often are hampered by mentor–student teacher matching problems and the limits on time due to the ongoing demands of teaching (Ganser, 1996). Our model of teacher preparation (described in detail below) attends to these concerns in order that mentors and student teachers can realize the reciprocal and collaborative benefits of successful mentoring relationships and hone their skills for teaching SRL.

In addition to the careful selection of mentors and promotion of effective mentor-student teacher relationships, our cohort exists within a teacher education program that is committed to articulating student teachers' experiences in schools and on campus and promoting an orientation to teaching that includes inquiry and reflection. In this program student teachers are grouped into cohorts (typically 18 student teachers) who take core courses and complete an integrated practicum together. Some cohorts focus on a particular aspect of teaching and learning (e.g., middle schools, problem-based learning). Our cohort emphasizes the promotion of SRL.

The Cohort

Year 1. In September 2001, 19 student teachers (three males), indicating an interest in the SRL concentration on their registration form, were grouped to form an SRL cohort. Throughout the year they apprenticed with 19 elementary school teachers (five males) in 10 schools in a large suburban school district outside Vancouver, British Columbia, Canada, and with two faculty associates from the university. Faculty associates are teachers from school districts seconded by the university to supervise student teachers' practica. Often they teach courses in the teacher education program on a sessional basis. One of the faculty associates in Year 1 was a former teacher from the district where we worked and a high-SRL teacher from one of Perry's previous investigations. The second faculty associate was a doctoral student and an early childhood educator who shared our interest in promoting SRL.

The school district serves a diverse student body (more than 33% of students speak English as a second language) and supports students with disabilities in their

neighborhood schools. Schools participating in the project served the full range of SES communities (69% of teachers reported that their schools served low-middle- to middle-high-SES communities). Teachers were selected to mentor the student teachers on the basis of their use of or interest in high-SRL teaching practices. Among them, they had between 5 and 32 years of teaching experience ($M = 25$ years). Most mentors (69%) had completed bachelor's degrees plus some postdiploma courses, and three had completed master's degrees. Three of the mentors had participated in Perry's previous investigations. The remaining 16 mentors were nominated and recruited by the faculty associate who had taught in the district or selected from a list of respondents to an information letter that was sent to elementary school teachers throughout the district in May 2001. In September each student teacher was paired with a mentor and, with the exception of three pairings, these mentor–student teacher relationships lasted throughout the school year. Seventeen mentor–student teacher dyads participated in the cohort's research activities.

Year 2. In Year 2, September 2002, the SRL Cohort included 18 mentor–student teacher dyads (none of the mentors and five of the student teachers were male). Mentors had between 5 and 32 years of teaching experience ($M = 15$ years), and most (53%) had completed bachelor's degrees plus some postdiploma courses. Six of the mentors continued from Year 1. Recruitment for the remaining 12 was the same as in Year 1. The doctoral student who had served as a faculty associate in Year 1 became the research coordinator in Year 2. The faculty associate who replaced her was a former school administrator in the same school district with many years of teaching experience and high interest and expertise in SRL. One of the student teachers withdrew from the teacher education program during the fall. The other dyads remained intact throughout the year. Fifteen mentor–student teacher dyads participated in the cohort's research activities. The mentors in four of these dyads were returning from Year 1. The dyads were spread across nine schools in low-middle- to high-SES communities (57% of mentors characterized their school neighborhoods as middle-high SES).

Cohort Activities

Year 1. An overview of the cohort and research activities across the school year is provided in Table A1 in the appendix. Throughout the fall, the preservice teachers observed in their mentors' classrooms on Tuesday mornings. The faculty associates also visited classrooms on Tuesday morning as a way of establishing a school-university link for mentors and to assess the compatibility of the mentor–student teacher matches. On Tuesday afternoons we (the researchers and faculty associates) met with the SRL cohort in a professional seminar. We applied a framework similar to the one Perry used with practicing teachers to these seminars to provide guided and sustained opportunities for the student teachers to critically examine whether and how their mentors promoted SRL in their classrooms. In addition, we asked student teachers to consider how practices in the classrooms in which they were observing aligned with or challenged their beliefs about teaching and learning and to design and experiment with high-SRL activities in their mentors' classrooms throughout the fall term. The mentors were released from their teaching responsibilities to attend the seminar twice in the fall. On these occasions student teachers and mentors collaboratively planned for and reflected on high-SRL activities in their classrooms.

In January the student teachers completed a 2-week practicum in which they implemented a "mini" unit of instruction (three connected lessons) that incorporated practices known to promote SRL (e.g., giving students choices and opportunities to control challenge and evaluate their work). Student teachers developed this unit with their mentors during the professional sem-

inar in the fall. Toward the end of January student teachers returned to the university to undertake course work that would prepare them for an extended 13-week practicum that began on March 25 and continued until the end of June. During the extended practicum the student teachers had opportunities to plan and reflect with their mentors and faculty associates, who visited each teacher dyad biweekly to debrief student teachers on their developing practices, particularly those demonstrated to promote (or curtail) SRL. The professional seminar met twice during the winter term and twice during the student teachers' extended practicum. The mentors also attended the cohort meetings during the extended practicum.

Year 2. The cohort's activities were the same in Year 2 with two additions. Two members of the research team (the faculty associates in Year 1) taught two of the courses the student teachers took on campus during the fall and winter: Principles of Teaching, and Educational Psychology. This provided even more continuity between student teachers' on-campus and in-school experiences and enabled the researchers/university teachers to embed more SRL content in the instruction about teaching and learning that student teachers received. Especially, instructors increased attention to the qualities of tasks that present opportunities for students to engage in SRL in response to findings from Year 1 (described later).

Also, in Year 2 we devoted more attention to helping mentors hone their skills as "school-based teacher educators" (Clarke & Riecken, 2000, p. 347). According to Clarke and Riecken, working with student teachers is a complex and uncertain activity that requires knowledge about how teachers learn. It requires that mentors become coinvestigators in the practices being learned (e.g., ways of promoting SRL) and inquirers into their practices as teacher educators (Clarke & Riecken, 2000, p. 349). Without exception, our observations of the teachers who mentored student teachers in our cohort in Year 1 showed that they were highly effective teachers who automatically engaged in many practices known to promote SRL. However, Year 1 mentors and their student teachers noted that many of the practices observed in mentors' classrooms reflected tacit understandings of SRL—mentors were not always aware of or able to explain how their practices related to or influenced particular aspects of SRL. More generally, mentors perceived a need to develop knowledge about how best to mentor student teachers.

We addressed these issues by helping mentors to make more explicit links between SRL theory and their practices and to learn ways of supporting student teachers' developing beliefs and practices concerning SRL. In addition to arranging for mentors to attend two of the professional seminars to plan with their student teachers, we invited mentors to attend the first seminar with the student teachers. This seminar occurred before student teachers were assigned to classrooms. In this way, mentors heard the first information given to student teachers about the cohort's focus on SRL and the rationale for it. In addition, throughout the year we encouraged student teachers to discuss their observations and reflections about SRL with their mentors, making connections between what they were learning on campus and in classrooms for their mentors. Similarly, faculty associates made explicit mention of features of classroom practice that promote SRL in their debriefing sessions with mentors and student teachers. Finally, mentors were given copies of the readings and handouts student teachers received concerning SRL.

Research Activities

Year 1. During the fall term we videotaped each of the professional seminar meetings, collected samples from the student teachers' reflections journals, and collected the high-SRL units they designed with their mentor teachers. During the winter term, when the student teachers were engaged in course work at the uni-

versity, we observed in each mentor's classroom twice to examine the extent to which mentors modeled practices associated with SRL. During the student teachers' extended practicum, we observed their teaching and collected samples of their lesson and unit plans to document the extent to which the elements of high-SRL practices were evidenced in their teaching. We observed each student teacher three times, at the beginning, middle, and end of the long practicum. Finally, the faculty associates audiotaped three of their debriefing sessions with the mentor–student teacher dyads during the long practicum.

Year 2. The research activities in Year 2 were the same, with two exceptions: the researchers observed in the mentors' classrooms three times, twice during the fall and once during the winter when student teachers were engaged in full-time course work at the university. Near the end of the extended practicum (June), the researchers interviewed the mentors about their mentoring experiences.

Space limitations prevent us from reporting the findings from all of our data-collection activities here. Therefore, we have chosen to focus on the data from Year 1 and Year 2 observations in the mentors' and student teachers' classrooms. Particularly, we have focused on evidence that mentors were modeling high-SRL practices in their classrooms, student teachers were learning to design tasks and interact with students to promote SRL, and the extent to which student teachers' practices reflected those of their mentors.

The observation protocol. The observation instrument we used was developed by Perry (1998) and used in previous investigations (Perry & VandeKamp, 2000; Perry et al., 2002). It is divided into three sections. Section 1 records information about (*a*) whose classroom is being observed, in what school, and at what grade level; (*b*) who is observing; (*c*) the date of the observation; and (*d*) the nature and duration of the activity in which teachers and students were engaged during the observation. Section 2 provides space to keep a running record of "what's going on," including verbatim samples of teachers' and students' speech. Section 3 lists categories, derived from previous investigations, that distinguish high- and low-SRL activities/environments, including (*a*) types of tasks (complex/open or closed), (*b*) types of choice (about what, who, where, when), (*c*) opportunities to control challenge, (*d*) opportunities for self-evaluation, (*e*) support from the teacher (instrumental vs. procedural), (*f*) support from peers, and (*g*) teachers' evaluation practices (high stakes or not). This list of categories provides a conceptual framework for interpreting the extent to which teachers' practices are aligned with those believed to promote SRL. It continues to be refined and expanded through our ongoing observations. In this way, our analyses reflect both analytic and emergent categories (Strauss, 1987).

During each observation, we position ourselves so that we can clearly see and hear the teacher and students without being intrusive. We record events and actions, including a list of times related to events and actions, and, as much as possible, verbatim speech in teacher-student and student-student interactions.

After each observation, we read and annotate our running records, adding details regarding events and actions that we did not have time to record during the observation and filling in gaps in teachers' speech with paraphrases of what they said. (Paraphrases are marked with brackets.) Once we are satisfied that the running record is as detailed and accurate as our memories will allow, we re-read it, noting incidents/examples reflected in our original list of analytic categories in the third section of the observation instrument, as well as events and actions that suggest refinements or additions to those categories (i.e., emerging categories).

Coding. Our analyses of the running records focus on features of the task/activity

and what teachers say and do to promote SRL in the task environment. First, drawing on the list of categories in the third section of our running record, we characterize tasks as complex if we find evidence that they focus on multiple goals, involve large chunks of meaning, extend more than one class period, and allow for a variety of processes and products. Also, we identify instances of teachers' speech and actions that are believed to promote SRL (e.g., giving choices, engaging students in various forms of self-evaluation). Next, we assign each running record a rating of 0, 1, or 2 for each of the overarching categories (e.g., task, choice, challenge, self-evaluation) to indicate the presence of and extent to which the attribute prompts SRL. For example, students may have no choices in an activity (no choice = 0), some choice but not choices that lead to the kind of high-level decision making that is involved in SRL (a choice to use a red pen or a blue pen or a choice to draw a picture on the back of a worksheet = 1), or choices that engage them in thinking metacognitively or strategically (choose a topic that interests you and you know something about or choose a place to work where you can spread out and concentrate = 2). These category ratings are entered in a summary table for each class to generate a profile of the consistency with which activities in that classroom are judged to be high SRL across multiple observations. Finally, we return to each instance of teacher speech and action and consider what aspect of self-regulation it promotes and how.

A limitation of our research is the number of times we observed in each class and the extent to which what we saw on those occasions was representative of what went on day to day. We do not expect teachers and students to be engaged in complex tasks all of the time (one could argue that they couldn't and shouldn't be), and it is possible that we could miss examples of teachers teaching for SRL. Therefore, we have given teachers the benefit of the doubt and focused our analyses on the running records that we judged to be the best examples of mentors' and student teachers' teaching for SRL.

Research Questions

As indicated above, three questions drive our larger program of research: (*a*) What level of experience/expertise is required to create high-SRL environments? (*b*) How can teachers gain such expertise? (*c*) How expert must instruction be to influence young students' SRL positively?

Our analyses of data from Years 1 and 2 offer no definitive answers to these questions. However, we believe our analyses of classroom observations from Years 1 and 2 offer evidence that (*a*) student teachers had opportunities to observe SRL practices in their mentors' classrooms; (*b*) student teachers can design tasks and engage in practices that promote academically effective SRL; and (*c*) student teachers' tasks and practices, in large measure, reflect those modeled by their mentors. Furthermore, although our focus in Years 1 and 2 has not been on outcomes for the elementary school students in these teachers' classrooms (this is a focus in Years 3 and 4), our data indicate that opportunities for them to develop and engage in SRL are influenced by qualities of the task environment. Specifically, we have evidence that task complexity is related to students' opportunities to make choices, control challenge, collaborate with peers, and reflect on learning in ways that are believed to enhance metacognition, intrinsic motivation, and strategic action.

Results and Discussion

Observations of the Mentors' and Student Teachers' Teaching

Year 1. Table 1 shows our ratings of the tasks and practices we observed in the mentors' and student teachers' classrooms during Year 1. A total SRL score (the sum of the individual ratings) is indicated for each teacher. We judged that total scores of less than 9 reflect environments where opportunities to engage in SRL are more curtailed than promoted. Scores of 10 to 12 reflect en-

TABLE 1. Ratings of Student and Mentor Teachers' High-SRL Practices, Year 1

Teacher Dyads	Choice	Challenge	Self-Evaluation	Peer Support	Teacher Support	Task	SRL Total
Dyad 1:							
Student	2	2	2	2	2	2	12
Mentor	2	2	2	2	2	2	12
Dyad 2:							
Student	2	2	2	2	2	2	12
Mentor	2	2	0	2	2	2	10
Dyad 3:							
Student	2	2	2	2	2	2	12
Mentor	1	1	2	2	2	1	9
Dyad 4:							
Student	2	2	2	2	2	2	12
Mentor	2	2	1	1	1	1	8
Dyad 5:							
Student	2	2	2	2	2	1	11
Mentor	2	2	2	2	2	2	12
Dyad 6:							
Student	1	2	2	2	2	1	10
Mentor	2	2	1	1	2	1	9
Dyad 7:							
Student	2	2	1	2	2	1	10
Mentor	1	1	2	1	2	1	8
Dyad 8:							
Student	1	2	2	2	1	1	9
Mentor	2	2	2	2	2	2	12
Dyad 9:							
Student	1	1	2	2	2	1	9
Mentor	1	1	1	2	2	1	8
Dyad 10:							
Student	1	1	1	2	2	1	8
Mentor	1	1	2	2	2	1	9
Dyad 11:							
Student	1	1	0	2	2	1	7
Mentor	1	0	0	2	1	1	5
Dyad 12:							
Student	1	1	1	1	1	1	6
Mentor	2	2	1	2	2	2	11
Dyad 13:							
Student	1	2	0	1	1	1	6
Mentor	2	1	2	2	2	1	10
Dyad 14:							
Student	1	2	0	1	1	1	6
Mentor	2	1	2	2	2	1	10
Dyad 15:							
Student	1	1	1	1	1	0	5
Mentor	1	1	1	1	1	0	5
Dyad 16:							
Student	1	1	1	1	0	0	4
Mentor	1	1	2	2	1	1	8
Dyad 17:							
Student	1	1	0	1	1	0	4
Mentor	1	2	1	2	0	0	6

NOTE.—The ratings of the student teachers' tasks are listed in order from the highest to the lowest SRL scores.

vironments where students have many opportunities to develop and engage in SRL. Table 2 summarizes the proportion of mentors and student teachers receiving total SRL scores of 9 or higher and whose tasks reflected all of the criteria we identified for complex tasks (addressed multiple goals, involved large chunks of meaning and multiple processes, allowed for the creation of varied products).

Table 2. Percentage of Mentors and Student Teachers Receiving High-SRL Ratings for Tasks and Practices

	Year 1 ($N = 17$)		Year 1 ($N = 14$)	
	Mentors	Student Teachers	Mentors	Student Teachers
High-SRL practices	59	47	78	86
Complex tasks	29	24	50	76

Ten (59%) of the mentors received a total SRL score of 9 or greater for the tasks and practices we observed in their classrooms, and seven (41%) of these mentors received a score from 10 to 12. In these high-SRL classrooms, students had opportunities to (*a*) engage in complex tasks (e.g., students teaching concepts of light reflection and refraction to their classmates), (*b*) make decisions that involve metacognition (e.g., how to achieve the learning outcomes, what examples to use, how to involve peers), and (*c*) evaluate their learning (e.g., keep and submit a reflections journal that annotates the experience of planning and teaching about reflection and refraction). Also, in all of these classrooms, students received high levels of instrumental support from their teachers and peers. In contrast, in classrooms where tasks and practices received a total SRL score of less than 9, students had fewer opportunities to engage in the kinds of thinking and acting that are believed necessary for SRL to develop or occur. Most (70%) of the tasks we observed in the mentors' classrooms did not meet all of our criteria for complex tasks. This may mean that the student teachers did not witness as many concrete examples of complex tasks as we would have liked, or as many as they might need to understand how to design such tasks on their own. Other researchers have indicated (McCaslin & Good, 1996; Rohrkemper & Corno, 1988; Turner, 1997), and our data show (see later in section describing high- and low-SRL tasks), that complex tasks are associated with the presence of other features of environments known to promote SRL (choice, opportunities to control challenge, etc.). When tasks are not complex, the presence of the other features to a degree that supports SRL is less predictable.

Eight student teachers, about half, received a total SRL score of 9 or higher. These findings indicate that beginning teachers, with all that they are trying to learn about teaching, can design tasks and interact with students in ways that promote SRL. This finding is important given the research that indicates teaching SRL is not easy and may not be possible for newcomers to the profession (Brown & Campione, 1994; Whitaker, 2000). At least some of the student teachers in the SRL cohort proved themselves capable of such instructional sophistication and innovation.

As was true in the mentors' classrooms, most (76%) of the tasks we observed in the student teachers' classrooms did not incorporate all of the attributes in our definition of complex tasks. Several of the tasks rated 1 were complex in that they addressed multiple goals and allowed for a variety of processes and products. However, only four of the tasks we observed in student teachers' classrooms also dealt with large chunks of meaning and extended beyond the period in which we observed. Most of the tasks we observed failed to connect students' learning and activity to a larger project or learning agenda. Typically, they did not integrate skills and curricula. These observations echoed those of mentors whose tasks received the same rating.

Year 2. Our ratings of the tasks and practices we observed in the mentors' and student teachers' classrooms during Year 2 are shown in Table 3. Proportions of mentors and student teachers receiving total SRL scores of 9 or higher and whose tasks were judged to be complex according to our cri-

teria are summarized in Table 2. Eleven (78%) of the mentors received a total SRL score of 9 or higher for the tasks and practices we observed in their classrooms, compared with 59% in Year 1, and nine (64%) of these mentors received a score from 10 to 12. Half of the tasks we observed in the mentors' classrooms met all of our criteria for complex tasks, compared with 30% in the previous year. In Year 2, 12 (86%) of the student teachers received total SRL scores of 9 or higher, compared with 47% in Year 1. Also, 76% of the tasks we observed in their classrooms met our criteria for complex tasks, compared with 24% in the first year of our study. These data improve on our findings in Year 1 and indicate a high rate of SRL promotion on the part of student teachers. They suggest that both mentors and student teachers benefited from the additional support we (the researchers and faculty associates) provided for teaching SRL in Year

TABLE 3. Ratings of Student and Mentor Teachers' High-SRL Practices, Year 2

Teacher Dyads	Choice	Challenge	Self-Evaluation	Peer Support	Teacher Support	Task	SRL Total
Dyad 1:							
Student	2	2	2	2	2	2	12
Mentor	2	2	2	2	2	2	12
Dyad 2:							
Student	2	2	2	2	2	2	12
Mentor	2	2	2	2	2	2	12
Dyad 3:							
Student	2	2	2	2	2	2	12
Mentor	2	2	2	2	2	2	12
Dyad 4:							
Student	2	2	2	2	2	2	12
Mentor	2	2	2	2	2	1	11
Dyad 5:							
Student	2	2	2	2	2	2	12
Mentor	2	0	2	2	2	2	10
Dyad 6:							
Student	2	2	2	2	2	2	12
Mentor	2	0	2	2	2	1	9
Dyad 7:							
Student	2	2	2	2	2	2	12
Mentor	2	1	1	2	1	1	8
Dyad 8:							
Student	2	2	2	2	2	2	12
Mentor	0	1	0	1	0	0	2
Dyad 9:							
Student	2	1	2	2	2	2	11
Mentor	2	2	2	2	2	2	12
Dyad 10:							
Student	2	1	2	2	2	2	11
Mentor	2	2	2	2	2	2	12
Dyad 11:							
Student	1	1	2	2	2	1	9
Mentor	2	2	2	2	2	1	11
Dyad 12:							
Student	2	1	1	2	2	1	9
Mentor	0	0	1	1	1	0	3
Dyad 13:							
Student	2	1	0	1	2	1	7
Mentor	2	2	0	2	2	1	9
Dyad 14:							
Student	1	1	1	1	1	1	6
Mentor	2	2	2	2	2	2	12

NOTE.—The ratings of the student teachers' tasks are listed in order from the highest to the lowest SRL scores. The observation data for one of the 15 dyads were incomplete and are not included in these analyses.

2. Overall, our data in Years 1 and 2 suggest that the majority of student teachers had opportunities to observe practices associated with the promotion of SRL in their mentors' classrooms, and many of them were developing similar high-SRL practices.

Aligning Student Teachers' Practices with Their Mentors'

Year 1. In addition to knowing *that* beginning teachers can design tasks and interact with students in ways that support SRL, our program of research intends to illuminate *how* they acquire the knowledge and skill to do so. One of our working hypotheses is that the practices student teachers adopt are influenced to a large extent by their mentors' practices. To test this hypothesis, we computed a simple regression, testing the extent to which the mentors' total SRL score predicted the student teachers' total SRL score. The results of this analysis are shown in Table 4. They should be interpreted cautiously, however, given our small sample size and the somewhat constricted range of the total SRL scores. In Year 1 a marginally predictive relation between mentor and student teachers' scores ($r^2 = .195$, $p < .076$) is indicated. Descriptive statistics are shown in Table 5 and are very similar for the two groups. However, Figure 1 shows a more nuanced relation between mentors' and student teachers' practices. Specifically, a direct comparison between mentors' and student teachers' total SRL scores indicates that, although student teachers' tasks generally received ratings similar to their mentors' tasks (i.e., student teachers who received a total SRL score of 9 or higher had mentors who received a total SRL score in the same range), there were some differences across dyads. Seven of the student teachers' tasks incorporated more elements of SRL than their mentors' tasks, and three student teachers who received low total scores for the tasks we observed were apprenticing with mentors who received high total SRL scores. These findings suggest that, although the mentor–student teacher pairing may have accounted for some of the variance we observed across classrooms (approximately 19%), there were other sources of influence as well (e.g., the faculty associates and researchers, other experiences at the university).

Year 2. The regression analysis for the data in Year 2 yielded a nonsignificant result (see Table 4). We believe this can, in part, be attributed to the small sample size; the constricted range of the total SRL scores, especially for the student teachers; and three dyads where the total SRL scores for mentors and their student teachers were extremely disparate. Overall, descriptive statistics (Table 5) indicate a fair degree of similarity between the practices of mentors and student teachers, but Figure 2 reveals the idiosyncrasies across dyads. In Year 2 all but three mentors and two student teachers obtained a total SRL score in the high-SRL range. Six student teachers received higher total SRL scores than their mentors, and two of these student teachers had mentors with very low SRL scores (2 and 3, respectively). These data support the data from Year 1. Student teachers' practices tend to reflect those of their mentors. Also, as was the case in Year 1, these data indicate that there were other sources of influence as well. In Year 2 these may well have included the instruction student teachers received in their principles of teaching and educational psychology courses at the university. Also, the

Table 4. Mentor Teachers' SRL Practices Predict Student Teachers' SRL Practices

Predictor Variable	B	β	Total R^2	*df*	*F*	Significance
Mentor teachers' total SRL score:						
Year 1	3.268	.441	.195	1, 15	3.628	$p < .076$
Year 2	10.628	.002	.000	1, 12	.000	$p < .993$

TABLE 5. Descriptive Statistics for Mentor and Student Teachers' Total SRL Scores

	Year 1 ($N=17$)		Year 2 ($N=14$)	
	Mentors	Student Teachers	Mentors	Student Teachers
Mean	8.94	8.41	9.64	10.64
Median	9.00	9.00	11.00	12.00
Standard deviation	2.22	2.89	3.32	2.06
Maximum	12.00	12.00	12.00	12.00
Minimum	5.00	4.00	2.00	6.00

increased efforts of the faculty associates and researchers to make SRL teaching practices more explicit in debriefings with mentors and student teachers likely influenced student teachers' thinking about and teaching toward SRL.

Task Complexity Influences Opportunities for SRL

Year 1. A second working hypothesis of our study was that task complexity is associated with opportunities for students to engage in SRL. Specifically, we believe that

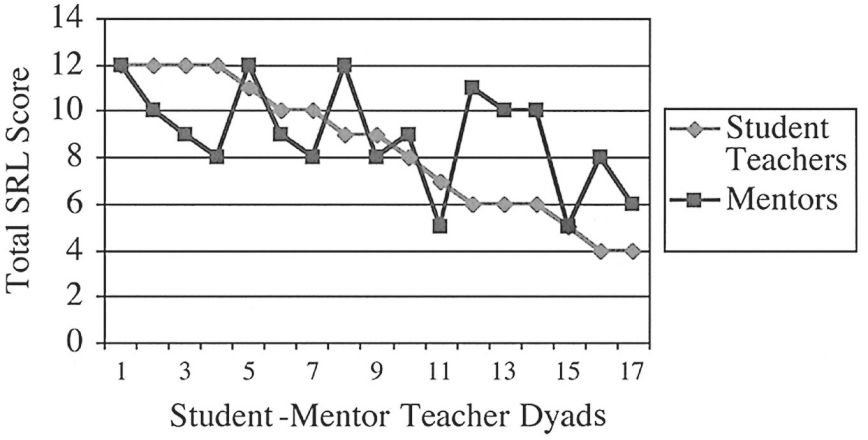

FIG. 1.—Student and mentor teachers' total SRL scores, Year 1

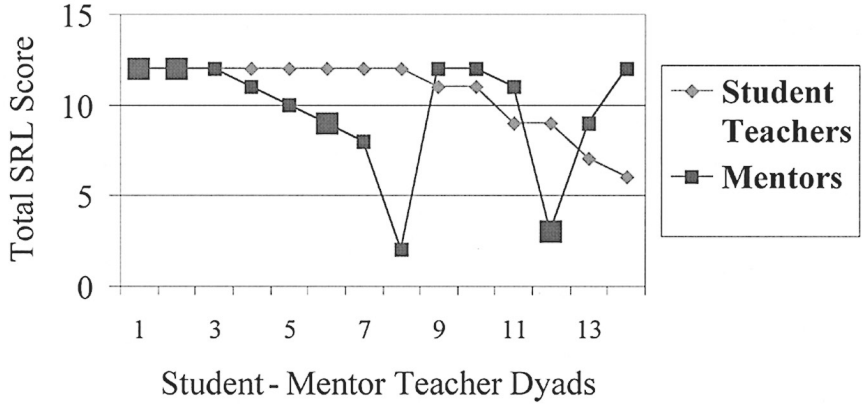

FIG. 2.—Student teachers' and mentors' total SRL scores, Year 2. Larger data points indicate mentors' participation in Year 1.

TABLE 6. Task Complexity Predicts Opportunities for Students to Develop and Engage in SRL

Predictor Variable	B	β	Total R^2	*df*	*F*	Significance
Task complexity:						
Year 1	4.852	.763	.582	1, 32	44.519	$p < .000$
Year 2	4.362	.677	.651	1, 25	46.654	$p < .000$

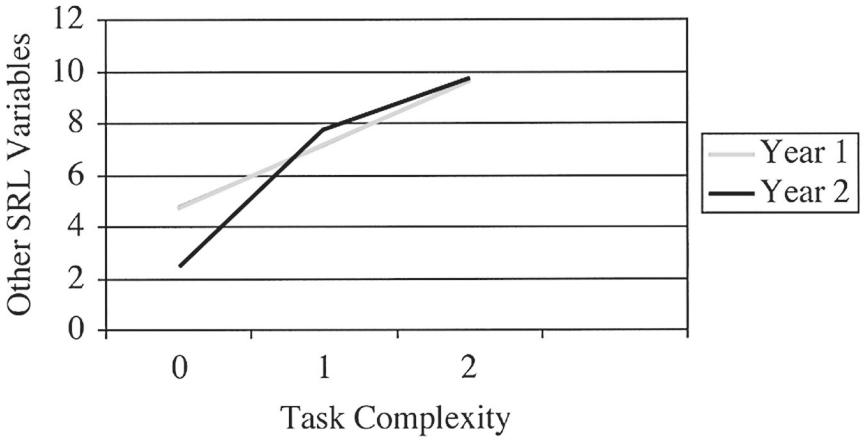

FIG. 3.—Task complexity and opportunities for self-regulated learning

tasks that have multiple goals, focus on large chunks of meaning, extend over more than one class period, involve multiple processes, and allow for the production of a variety of products are associated with opportunities for making choices, controlling challenge, self-evaluating, and collaborating. To test this hypothesis, we combined the mentor and student teacher data and computed a simple regression, testing the extent to which the teachers' task ratings predicted high ratings of the other features of environments known to promote SRL. Results are shown in Table 6 and indicate a strong predictive relation between task complexity and the other features of high-SRL environments ($r^2 = .582$, $p < .000$). Figure 3 shows how opportunities for engaging in SRL (making choices, controlling challenge, self-evaluating, etc.) increase as tasks become more complex (involve multiple goals, large chunks of meaning, multiple processes, etc.). For this reason, a primary goal of our project in Year 2 was to improve mentors' and student teachers' understanding and design of complex tasks. This goal was reflected in the instruction student teachers received in their principles of teaching and educational psychology courses. Also, more attention was given to the role of task complexity when mentors and student teachers planned together and when faculty associates debriefed their student teachers about their teaching.

Year 2. We described above that we observed more complex tasks in mentors' and student teachers' classrooms in Year 2. We observed the same relation between task complexity and opportunities for SRL in Year 2 as we observed in Year 1 (see Table 6 and Fig. 3). Therefore, working with teachers to design and implement complex tasks in their classrooms continues to be an important goal of our project in Years 3 and 4.

Conclusions and Future Directions

The research described here expands Perry's previous investigations of how features of classroom environments can promote or curtail students' development of and engagement in academically effective forms of SRL and how teachers can be

helped to design tasks and interact with students to promote these forms of learning. Specifically, we have described outcomes from the first and second years in a 4-year program of research that examines whether and how beginning teachers can be mentored to design tasks and develop practices that foster SRL in elementary school students. Research on SRL has paid relatively little attention to questions concerning the experience and expertise required to create high-SRL environments, how teachers acquire such expertise, and how expert instruction needs to be to influence students' SRL positively. Some research suggests it may be unreasonable to expect beginning teachers to achieve the instructional sophistication and student awareness required for teaching SRL (Brown & Campione, 1994; Whitaker, 2000). We believe finding answers to these questions is critical if instruction about SRL is to become as widespread as researchers think it should be (Randi & Corno, 2000).

The data presented here indicate that beginning teachers (student teachers) can design tasks and engage in practices that promote SRL in elementary school children. Roughly half of the student teachers in Year 1 and 86% of the student teachers in Year 2 of our study received a total SRL score of 9 or higher, indicating that they were embedding elements of instruction associated with SRL to a high degree. How student teachers develop these practices is a more complicated question. Our regression analyses need to be interpreted cautiously, but the Year 1 results suggest a modest predictive relation between student teachers' and mentors' tasks and practices. In general, high-SRL student teachers had high-SRL mentors. However, seven of the student teachers' tasks received a higher total score than their mentors', and three of the student teachers who received a relatively low SRL total score for the tasks we observed had high-SRL mentors. These findings indicate that, although the mentor–student teacher relationship may be a powerful one, there are other sources of influence on student teachers' developing practices. The findings in Year 2 support this conclusion.

Faculty associates have a role in scaffolding student teachers' design of tasks and providing evaluative information to student teachers about their practices in the classroom. In addition to being high-SRL practitioners themselves, both of our faculty associates had completed a graduate degree in which the focus of their studies related to SRL practices. The associates were knowledgeable about and deeply committed to modeling and teaching SRL. Furthermore, participation in the SRL cohort, the professional seminar, the integrated practicums, and the two courses taught by the faculty associates provided a high degree of continuity between student teachers' on-campus and in-school experiences. Often, these experiences are separated both in time and space and there is no forum for integrating knowledge with experience and, most important, for resolving discontinuities between the university and school contexts. In our model, student teachers' on-campus and in-school experiences coincide, and the professional seminar exists to help student teachers, along with faculty associates and mentor teachers, articulate those experiences. Also, students completed course work concurrent with their in-school experiences, and some of that course work (the professional seminar and principles of teaching course) was completed in schools in the district where they had their practicums.

Finally, our data support claims that task complexity is associated with opportunities to engage in SRL (McCaslin & Good, 1996; Rohrkemper & Corno, 1988; Turner, 1997). In Year 1 most of the tasks we observed in both mentors' and student teachers' classrooms did not incorporate all of the attributes in our definition of complex tasks. In these task environments we observed opportunities for students to make choices, modify tasks, and evaluate outcomes. However, many of the decisions they made were procedural, and self-evaluation often was limited to matching answers with those on the board or in

the back of a book. In Year 2 we tried to focus teachers' attention on what students were being self-regulated about. Specifically, we increased support to mentors and student teachers to improve their understanding and design of complex tasks. As a result, we observed an increase in the complexity of tasks and students engaging in more meaningful forms of decision making and self-reflection.

Finding ways to help teachers design and implement complex tasks with attention to the other features of high-SRL environments will be a continuing goal in Years 3 and 4 of our project. Two sources of influence we have yet to investigate are teachers' knowledge of a content area and their efficacy for teaching it. We predict that teachers will be better able to design tasks that meet our criteria for being complex in subject areas where they have deep knowledge. Also, we predict that teachers will be more willing to share control of teaching and learning with students when they are confident that they can be an effective resource to them. Data concerning these issues should shed light on our project's third and final question: How expert does instruction need to be to influence students' SRL positively? Our goal is to link these teacher variables to evidence concerning elementary school students' SRL.

Appendix

Table A1. Cohort and Research Activities

Cohort Activities	Research Activities
September–December • Student teachers spend Tuesday mornings in their mentors' classrooms. • Tuesday afternoons, they meet in a professional seminar to plan and discuss their classroom experiences. • Mentors attend the seminar three times.	September–December • Videotape seminars • Collect samples of student teachers' reflections on teaching • Collect samples of one complex task • Observe mentors teaching two times
January–June • Student teachers complete a 2-week practicum in January. • They take courses at the university in February through March. • They complete a 13-week practicum in April through June. • The seminar meets after the January practicum and throughout the extended practicum. • Mentors attend the seminar twice during the extended practicum. • Faculty associates debrief with student and mentor teachers regularly during the extended practicum.	January–June • Videotape seminars • Collect samples of student teachers' reflections on teaching • Observe mentors teaching one time (while students are on campus) • Observe student teachers teaching 3 times (during their extended practicum) • Audiotape three 3-way debriefing sessions (student teachers, mentors, faculty associates)

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