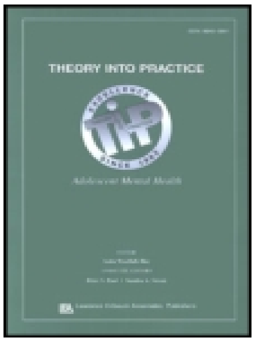

Theory Into Practice

Routledge Taylor & Francis Group

ISSN: 0040-5841 (Print) 1543-0421 (Online) Journal homepage: http://www.tandfonline.com/loi/htip20

# Individualizing Instruction in Self-Regulated Learning

Deborah L. Butler

**To cite this article:** Deborah L. Butler (2002) Individualizing Instruction in Self-Regulated Learning, Theory Into Practice, 41:2, 81-92, DOI: 10.1207/s15430421tip4102_4

**To link to this article:** https://doi.org/10.1207/s15430421tip4102_4

Published online: 24 Jun 2010.

*Deborah L. Butler*

# Individualizing Instruction in Self-Regulated Learning



NICK, A 10TH-GRADE STUDENT, consults his academic planner. He is dismayed to find that his history project is due Friday, since he hasn't even started researching. He groans out loud when he realizes that his science lab should be finished by the next block. He'll have to say that he forgot it at home and try to finish it tonight. His math homework is also due tomorrow, he thinks, so he'll have to do that too. But he considers whether he should even bother, given how hopeless he is at math. As he slams closed his agenda, his dismay turns to panic. He recalls that, on top of everything else, he has to write a paragraph for English. He wonders for a moment what a "narrative" paragraph even is, before deciding not to think any more about that one.

In the above scenario, Nick faces a series of challenges that typically confront secondary and postsecondary learners. By this educational level, students must juggle a potentially mind-boggling array of academic assignments. To be successful, students need excellent strategies for managing their time and organizing their work. At the same time, they need effective approaches for performing a variety of specific tasks. For example, to be successful, Nick must know how to complete his history project (i.e., researching, reading for information, taking notes, writing, constructing a poster, presenting information orally, etc.), carry out a science lab (i.e., applying science concepts, interpreting a science text, following instructions, recording observations, writing up findings, etc.), do math homework (i.e., representing problems, finding a solution plan, following procedures, calculating, checking), and write a narrative paragraph (i.e., planning, composing, revising, editing). During his cumulative experience in school, Nick is expected to construct productive understandings about these kinds of tasks (e.g., what *is* a narrative essay?) as well as efficient strategies for completing them. He also needs to construct positive self-perceptions about his competence (e.g., that he *can* be successful in math) that can fuel his strategic efforts.

This article describes how teachers can provide instruction that promotes students' successful navigation through academic work. To begin, I show how models of self-regulated learning characterize important kinds of knowledge, beliefs, and skills that students like Nick need to construct in order to be successful in school. Next, I present a theoretically grounded instructional model, Strategic Content Learning (SCL), that has been shown to promote self-regulated learning by secondary and postsecondary students with learning disabilities (e.g., Butler, 1995, 1998a, 1998d, 1999). Finally, I describe how SCL instructional principles can be adapted to individualize instruction in self-regulation across three instructional configurations: one-on-one, small-group, and whole-class structures.

Imagine, for example, that you are a teacher who has the opportunity to work one-on-one with

*Deborah L. Butler is associate professor of education at the University of British Columbia.*

*THEORY INTO PRACTICE, Volume 41, Number 2, Spring 2002*

Nick, perhaps in a pull-out learning assistance center or an after-school tutoring program. Where would you start to provide support so Nick could be more successful? Or suppose you have the opportunity to work with small groups of students who were struggling to complete a common task, such as writing a narrative essay. What would you do within the small group to foster students' self-regulated approaches to writing? In a final scenario, imagine you are Nick's English teacher hoping to foster his, and other students', writing skills. How could you meet students' individual needs while promoting strategic writing by a whole class of students? To answer these questions, this article provides research-based, practical guidelines for individualizing instruction in self-regulation across varying instructional settings.

## Defining Self-Regulated Learning

Self-regulated learners engage recursively in a cycle of cognitive activities as they work through a given task (Butler & Winne, 1995; Zimmerman, 1994). To begin, self-regulated learners analyze task demands. When presented with a history report, for example, a self-regulated learner examines cues to determine what is required. The student might review notes from a teacher's verbal instructions or scrutinize assignment descriptions to extract information regarding the topic, expected procedures, required products, and/or marking criteria. As part of this process, the student would draw on his or her prior knowledge about what makes a good "report" (i.e., "metacognitive knowledge" about the task). For example, the student might recall that, in a report, teachers expect solid research, a clear and organized presentation, and/or appropriate references. Task analysis is critical to effective self-regulation because it sets the context for further learning. Students base subsequent decisions (e.g., about strategies to use) on their perception of task demands.

Based on the requirements of a particular task, self-regulated learners then select, adapt, or even invent strategic approaches to achieve task objectives. As in task analysis, students draw on prior knowledge and experience to make strategy decisions (i.e., metacognitive knowledge about strategies). For example, when selecting strategies, self-regulated learners consider approaches that have worked in the past when confronting similar expectations.

Once self-regulated learners implement strategies, they monitor outcomes associated with strategy use. Effective learners self-evaluate by comparing progress against task criteria to generate judgments about how they are doing. If they perceive gaps between desired and actual performance, they adjust learning activities accordingly. Effective learners also interpret externally provided feedback (e.g., marks on tests, teacher or peer comments on writing) as they self-evaluate performance. They use feedback strategically to diagnose challenges and problem solve solutions. As with task analysis, monitoring is critical to effective self-regulation. This is because, during monitoring, students generate judgments about progress and make decisions that shape further learning activities.

Therefore, to promote student self-regulation teachers must assist students to engage flexibly and adaptively in a cycle of cognitive activities (i.e., task analysis, strategy selection and use, and self-monitoring). Further, key instructional targets include promoting students' construction of (a) metacognitive knowledge about academic work, (b) strategies for analyzing tasks, (c) metacognitive knowledge about task-specific strategies (e.g., for managing work, history reports, reading textbooks, writing paragraphs, learning math), (d) skills for implementing strategies, and (e) strategies for self-monitoring and strategic use of feedback. Note that in this model of self-regulation, effective use of task-specific strategies is essential to task completion. However, strategy instruction alone (e.g., how to apply strategies for reading comprehension) is clearly not sufficient. Instead, what is required is explicit attention to how students adapt strategies reflectively and flexibly within recursive cycles of task analysis, strategy use, and monitoring (Butler & Winne, 1995; Harris & Graham, 1996).

Another key instructional goal is to promote students' positive self-perceptions of competence and motivational beliefs (Borkowski, 1992; Schunk, 1994). For example, critical to students' engagement in strategic learning are their perceptions of self-efficacy, which have been defined as their "beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives" (Bandura, 1993, p. 118). Students' perceptions of self-efficacy influence the goals they set, their commitment to those goals, and the learning strategies employed (Bandura, 1993; Schunk, 1994). Low perceptions of self-efficacy undermine students' willingness to invest effort in tasks. In this light, consider how Nick's attitude toward his math homework is influenced by his low self-perception of competence in math.

Related to students' perceptions of self-efficacy are their attributional beliefs. Attributions are students' causal explanations for success or failure (Borkowski, 1992; Schunk, 1994). *Productive* attributional beliefs, which support strategic performance, link outcomes to controllable factors, such as applying effort or using strategies. *Unproductive* attributional patterns reflect low self-perceptions of control over outcomes (e.g., attributing failure to low ability; attributing success to luck) and undermine students' engagement in active learning. Thus, to promote self-regulated learning, teachers must assist students to develop positive perceptions of self-efficacy and productive attributional beliefs.

The importance of the range of instructional targets described in this section was demonstrated in a study by Butler (1999). Butler analyzed the pretest task performance of 90 postsecondary students with learning disabilities who later participated in intervention studies. These students were enrolled in college-level programs (Adult Basic Education, vocational, or academic), had a range of academic skills (from grade 3 to college level), and focused on varying tasks (e.g., reading, writing, or math). Using a combination of questionnaires, interviews, and observations, Butler documented students' metacognitive knowledge about self-regulated processes, perceptions of self-efficacy, attributional patterns, and self-regulated approaches to learning. She found that, prior to intervention, participants' metacognitive knowledge about tasks, strategies, and monitoring was deficient (see also Butler, 1998c; Englert, 1990; Wong, 1991). Students also held low self-perceptions of self-efficacy and unproductive attributional patterns. Overall, 76% of students experienced difficulties describing and/or implementing task-specific strategies. Significantly, 81% of students had trouble either describing task demands and/or articulating criteria for monitoring. This latter finding emphasizes the importance of focusing on more than just teaching strategies, since for a majority of students performance also was undermined by problems with task analysis and/or monitoring. Nonetheless, Butler argued that students did not enter instruction as self-regulating "blank slates" (Butler & Winne, 1995). For example, 68% of students provided a reasonable description of strategic approaches, even if their knowledge about strategies was not well developed or well matched to task demands. Butler concluded that students possessed knowledge and skills on which teachers could build when promoting self-regulation.

## The Strategic Content Learning (SCL) Instructional Model

Strategic Content Learning (SCL) is an empirically validated instructional model designed to promote self-regulated learning. In prior research, SCL has been evaluated when implemented to support secondary and postsecondary students with learning disabilities across a variety of service delivery models. For example, at the postsecondary level, research has documented SCL efficacy when used to support students with learning disabilities during one-on-one tutoring (Butler, 1993, 1995, 1998a, 1998d; Butler, Elaschuk, & Poole, 2000) and small-group instruction (Butler, Elaschuk, et al., 2000). At the secondary level, SCL has been adapted to support students receiving individualized assistance in pull-out support blocks (Butler, Jarvis, Beckingham, Novak, & Elaschuk, 2001) and to foster self-regulated writing in English classrooms (Butler, Novak, Beckingham, Jarvis, & Elaschuk, 2001). In this section, I outline the theoretical principles grounding the SCL model. Subsequently, I highlight how SCL enables teachers to individualize instruction in self-regulation within one-on-one, small-group, and whole-class instruction.

Several theoretical arguments converged in the development of SCL. First, SCL was based on an analysis of self-regulated, or strategic, performance, as outlined in the last section. Building from models of self-regulated learning, key instructional goals were defined (as above), including students' construction of metacognitive knowledge, motivational beliefs, and self-regulated approaches to learning. Next, instructional practices were defined in terms of a model of self-regulation. Indeed, the central SCL instructional guideline is for teachers to support students' reflective engagement in cycles of self-regulated learning (i.e., task analysis, strategy implementation, self-monitoring). For example, to support Nick in completing his history report, an SCL teacher would start by helping Nick analyze his task. He would be asked to interpret available information (e.g., verbal explanations from his teacher, assignment descriptions) to define performance criteria for such items as report content and format. Then Nick would be guided to identify and implement strategies for meeting task requirements (e.g., for researching, organizing his ideas, writing, revising). Finally, Nick would be supported to self-evaluate outcomes in light of task criteria (e.g., how well his report covered expected information, the appropriateness of the format), and to refine his task-specific strategies so as to redress problems or challenges encountered (e.g., to fill in missing information).

Second, in SCL the primary emphasis is *not* on teaching predefined strategies for completing academic tasks. From a theoretical perspective, it could be argued that, if instruction focuses primarily on the direct explanation of predefined strategies, students may be inadvertently excluded from the problem-solving process central to self-regulation (Butler, 1993, 1995). Indeed, if it is the teacher or researcher who analyzes a task, anticipates problems, and defines useful strategies, then students have little opportunity to problem solve strategies themselves. To avoid this problem, in SCL, teachers co-construct strategies with students, bridging from task analysis (see Butler, Elaschuk, & Poole, 2000). Teachers and students work collaboratively to find "solutions" (i.e., strategies) that meet task demands. So, for example, when defining strategies for completing a history report, Nick would be asked to consider strategy alternatives in light of task demands (e.g., if he needs to gather information about a particular topic, strategies he can use to gather that information, etc.). Then, while working through the task collaboratively, Nick would be supported to try out strategy alternatives (e.g., for researching information), judge strategy effectiveness (e.g., whether he found the needed information), and modify strategies adaptively (e.g., to search in other locations). Over time, through this iterative process, Nick would (ideally) learn *how to* construct personally effective strategies for meeting varying task demands.

A third theoretical influence on SCL instructional principles was an integration of constructivist and sociocultural learning theories. Constructivist models suggest that students build knowledge and beliefs based on an interaction between prior knowledge and current experiences (Harris & Pressley, 1991). It follows that, to promote knowledge construction about learning, instructors need to (a) engage students in meaningful work, (b) surface students' existing knowledge and beliefs, (c) engage students in interactive discussions about learning processes, and (d) ask students to articulate revised and/or emerging understandings based on new experiences.

In contrast, sociocultural learning theories emphasize how students' problem solving (or self-regulation) is strongly influenced by the cultural contexts in which they learn. Thus, learning is a social, not just an individual, process. Further, these models specify how students' construction of knowledge is shaped and constrained by the language and tools available in social and cultural contexts (Butler, 1998b; Harris & Pressley, 1991; Stone & Reid, 1994; Vygotsky, 1978). Instructional recommendations, from this perspective, are that teachers should (a) identify students' current level of problem-solving performance and what they could accomplish with assistance (i.e., in the Zone of Proximal Development), (b) provide scaffolded (calibrated) support that directs students' cognitive processing (e.g., strategy instruction), and then (c) deconstruct supportive scaffolds as students become more independent. In most applications of sociocultural models, it is presumed that students internalize the cognitive processes first modeled or directed by others. Eventually, cognitive activities supported socially become part of individuals' repertoires.

In SCL, constructivist and sociocultural theories are integrated to draw implications for instruction. While it is assumed that social and cultural contexts constrain the knowledge students construct, it is not assumed that students internalize cognitive processing first modeled on a social plane. Instead, it is hypothesized that students actively make use of language and tools to construct idiosyncratic knowledge and skills, even if the way students make sense of experience is shaped by social influences. Also, it is presumed that teachers and students connect to create learning opportunities when they establish a common context and language for describing shared experiences (e.g., teachers and students working collaboratively to complete a common task). In this process, both teachers and students work to construct a shared framework for understanding. Finally, it is hypothesized that verbalizing is a powerful tool for prompting students' distillation of new understandings. When students verbalize descriptions (e.g., about a task or a cognitive activity), they abstract generalized concepts about learning that formalize emerging knowledge and beliefs (Salomon & Perkins, 1989; Wong, 1994).

Implications for instruction based on this integrated view are that teachers should (a) collaborate with students to complete meaningful work (to generate a context for communication), (b) diagnose students' strengths and challenges by listening carefully to students' sense-making as they grapple with meaningful work, (c) engage students in collaborative problem solving while working towards achieving task goals, (d) provide calibrated support given students' areas of need to cue more effective cognitive processing, (e) use language in interactive discussions that students might employ to make sense of experience, and (f) ask students to articulate ideas (e.g., about task criteria, productive strategies) in their own words to promote distillation of new knowledge.

For example, to support Nick with his math homework, Nick and his teacher would work collaboratively on problems to set a context for communication (collaborating to complete meaningful work). Nick's teacher might begin by watching Nick solve one or two problems, asking him to think aloud as he worked (diagnosing Nick's strengths and challenges). Attention would focus on how Nick interprets his task, grasps math concepts, represents problems, identifies solution strategies, implements procedures, and self-monitors his work. Then, as described earlier, Nick's teacher would assist him to work recursively through cycles of task analysis, strategy use, and self-monitoring (collaborative problem solving while working towards task goals). When Nick did well, his teacher would support him to recognize his success and reflect on the strategies he just used that worked (articulating ideas). Nick would document these strategies in a running record that he could review, test, and refine over time. When Nick encountered difficulties, his teacher would assist him to problem solve more effectively (calibrated support). For example, the teacher might direct Nick's attention to a sample problem and support him to interpret that information. Nick would be asked to verbalize new insights and to try out new ideas (articulating ideas). Note that, depending on Nick's areas of difficulty, discussion might focus on problem-specific strategies (e.g., how to solve an algebraic equation), strategies useful for solving math problems generally (e.g., always checking your work), and/or strategies focused on learning math more independently (e.g., working through examples if stuck). Once Nick problem solved a better approach, he would revise his strategy record (articulating ideas).

A third influence on SCL was an analysis of learning mechanisms associated with transfer. For example, in one line of discussion, researchers proposed that students would be more likely to transfer learned strategies if they approached tasks reflectively, or "mindfully," and abstracted generalized principles about learning based on concrete task experiences (Salomon & Perkins, 1989; Wong, 1994). Consistent with this hypothesis, in SCL students are asked to articulate generalized principles about learning that build from emerging successes and are formulated in their own words. This approach is expected to empower students to construct knowledge and skills (e.g., about history reports or math problem solving) that would transfer to subsequent learning.

In other lines of discussion, researchers have developed a range of instructional activities that have been associated with better transfer. These include: (a) embedding instruction in the context of meaningful work so students recognize the relevance and usefulness of strategies, (b) supporting students to recognize when, where, and why strategies are useful, (c) promoting students' sense of ownership over strategies, and (d) promoting students' construction of motivational beliefs (e.g., positive perceptions of self-efficacy, productive attributional patterns) that support strategic processing (Borkowski, 1992: Palincsar & Brown, 1988; Schunk, 1994).

SCL contains features consistent with each of these further instructional recommendations. First, in SCL students' development of self-regulation is promoted in the context of meaningful work. Students and teachers work collaboratively on authentic tasks drawn from classroom contexts. Also, embedding strategy construction in self-regulating cycles clearly illuminates the usefulness of strategies because students consider strategy development in the context of explicitly articulated goals (e.g., task criteria). Second, in the context of interactive discussions (with teachers and/or with peers), students discuss when and why emerging approaches would promote greater success. For example, after scrutinizing the demands of a particular assignment, Nick would be asked how, why, and when analyzing tasks would be useful. Third, previous SCL studies have provided evidence that students feel greater ownership when they articulate strategies in their own words that they participated in constructing (see Butler, 1993, 1995). Finally, in SCL, students associate emerging successes with strategy use while they are engaged in self-monitoring. This process is designed to promote students' construction of positive self-perceptions of self-efficacy and productive attributional patterns (Borkowski, 1992; Schunk, 1994). When combined, these multifaceted instructional features are likely to promote students' transfer of strategic performance.

## Individualizing Instruction Across Instructional Structures

When promoting self-regulation, both constructivist and sociocultural theories stress the importance of building from students' existing knowledge and skills (Harris & Pressley, 1991; Vygotsky, 1978). But matching instruction to each student's needs is a challenge in today's increasingly diverse classrooms. Complicating the teachers' job is that, even when learners seem to be struggling with the same task (e.g., writing, math problem solving), their specific needs may differ. For example, one student's writing problems may stem from difficulty generating ideas, while another student may struggle with writing mechanics. Finally, because strategies that work well for one student may not work for another, it is difficult to find a simple set of strategies to teach a group of students. Thus, a challenge for educators is to define realistic and efficient ways of individualizing instruction that promotes self-regulation.

In this final section, I illustrate how SCL may assist educators to meet this challenge. Indeed, SCL is inherently individualized given that (a) students co-construct personalized strategies based on interactive discussions that can occur in dyads (teachers and/or peers) or groups, and (b) SCL teachers build from students' existing knowledge and skill when acting as facilitators of their cognitive processing. Table 1 describes how SCL instructional principles can be adapted by teachers to individualize instruction in one-on-one, small-group, or whole-classroom contexts. Rows detail general instructional principles and possible teaching practices designed to address key instructional targets.

### One-on-one instruction

Considerable research has documented SCL efficacy when used to provide one-on-one tutoring to secondary and postsecondary students with learning disabilities (Butler, 1993, 1995, 1998d; Butler & Briard, 2000; Butler, Jarvis, et al., 2001). To provide one-on-one support (e.g., in a support block or tutoring session), teachers start by identifying an authentic task of immediate importance to the student. Attention might focus on successive examples of one kind of task (e.g., learning math), so that students have opportunities to construct, try out, and revise strategies across a series of sessions. As an alternative, students might bring varying tasks to sessions, depending on immediate needs (e.g., Nick's history report, English paragraph, or math problems). The advantage of addressing multiple assignments is that students recognize how self-regulating performance, and controlling outcomes, is possible across varying tasks. In either scenario, it is critical to maintain students' focus on developing

**Table 1**

**Adapting SCL instructional practices for individual, small group, and whole class instruction.**

| Instructional targets | General instructional principles | Individual instruction | Small-group instruction | Whole-class instruction |
|---|---|---|---|---|
| Analyzing tasks and metacognitive knowledge about academic work | • Teacher supports student to identify cues that define task demands.<br>• Teacher facilitates discussions in which students (a) analyze task demands, (b) articulate performance criteria, (c) consider why analyzing tasks is helpful, (d) articulate personalized strategies for analyzing tasks. | • Student brings authentic tasks from classrooms.<br>• Teacher guides student to interpret cues and identify performance criteria.<br>• If applicable, student lists performance criteria to guide strategy selection and monitoring.<br>• Student records personalized strategies for analyzing future tasks in their own words. | • Students bring an authentic task from a common classroom, or examples of a similar task from different classrooms (e.g., writing).<br>• Students focus on one common task at a time.<br>• Teacher facilitates students' joint analysis of task requirements.<br>• Students construct individual or joint lists of task expectations.<br>• Students record personalized strategies for analyzing task demands in their own words. | • Teacher sets authentic tasks and clearly articulates task requirements.<br>• Teacher facilitates small- or large-group discussions that foster students' active analysis of task demands.<br>• Students submit a list of performance criteria as part of assignment.<br>• Teacher provides feedback on products and criteria. |
| Personalized approaches to learning and metacognitive knowledge about strategies | • Teacher guides students to (a) think through tasks successfully, (b) reflect on the process of learning, (c) articulate and evaluate strategies, (d) recognize successes, (e) revise ineffective methods.<br>• Student records personalized strategies in own words for reference and ongoing strategy development. | • Teacher observes student to identify current strengths and challenges.<br>• Teacher works with the student to complete a task collaboratively.<br>• Teacher asks questions to guide student's cognitive processing.<br>• Student reflects on the approaches he or she used that worked.<br>• Student records advice to him- or herself for tackling similar tasks in the future (i.e., strategies). | • Teacher facilitates small-group discussions.<br>• Students share ideas about strategies that have worked for them in the past.<br>• Teacher supports students to complete a common task collaboratively (e.g., a reading assignment).<br>• Teacher asks questions that promote analysis, use, and evaluation of strategies.<br>• Students record advice to themselves for completing similar tasks in the future. | • Teacher sets strategy development as a class goal.<br>• Teacher facilitates small- or large-group discussions about strategies that might meet task demands.<br>• Teacher provides procedural facilitators to guide students' cognitive processing.<br>• Teacher fosters collaborative task completion.<br>• Students submit personalized strategies as part of assignments.<br>• Teacher provides feedback on products and learning processes. |

**Table 1 (cont.)**

**Adapting SCL instructional practices for individual, small group, and whole class instruction.**

| Instructional targets | General instructional principles | Individual instruction | Small-group instruction | Whole-class instruction |
|---|---|---|---|---|
| Self-monitoring, self-evaluation, and positive self-perceptions | • Teacher assists students to (a) compare outcomes to task criteria, (b) interpret and use instructor feedback, (c) revise ineffective approaches, (d) link success to effortful strategy use, (e) articulate personalized strategies for monitoring.<br>• Students record revisions to strategies in their own words for reference and ongoing strategy development. | • Student completes work and/or brings in an assignment with teacher feedback.<br>• Teacher asks questions that guide student to (a) self-evaluate work quality, (b) analyze teacher feedback, (c) recognize successes, (d) identify problems and needed solutions.<br>• Student revises his or her strategy sheet with advice to him- or herself about what to do in the future. | • Teacher facilitates small-group discussions.<br>• Teacher guides students to evaluate outcomes, either in process or after receiving feedback from teachers.<br>• Students work together to compare outcomes to task demands.<br>• Students share ideas about how to revise approaches to build on successes but overcome challenges.<br>• Students record revisions to their personalized strategies in their own words. | • Teacher asks students to self-evaluate work prior to submission.<br>• Teacher provides feedback to students that references task criteria.<br>• Teacher requires students to interpret and learn from instructor feedback as part of the assignment.<br>• Teacher facilitates small- and/or large-group discussions in which students evaluate outcomes (anonymous) against task goals.<br>• Teacher provides feedback on products and the process of self-monitoring. |

long-term approaches to learning. Reflective discussions and strategy co-construction are undermined if students are racing to complete pressing work (see Butler, Novak, et al., 2001).

Once a task is selected, teachers provide calibrated support to guide students' self-regulation. As described earlier, starting with task analysis is key (row 1). Options include asking students to dissect assignment descriptions (verbal or written) and/or evaluate quality task examples (e.g., a good narrative paragraph). When approaching complex or multi-part tasks (e.g., when planning an essay or history report), asking students to articulate and list task criteria provides a useful guide for subsequent strategy selection and monitoring. Next, tutors should promote students' construction of personalized strategies (row 2). Interactive discussions should shift opportunistically between working through tasks (i.e., solving a math problem) and reflecting on the process of learning (i.e., strategies for learning math). As they calibrate support, building from students' existing knowledge and skills, teachers should support students to think through tasks (asking guiding questions) rather than telling them what to do (providing solution strategies). Asking students to document strategies, in their own words, allows for subsequent reference to emerging strategies and ongoing strategy development.

Teachers should also support students' self-monitoring (row 3). As part of self-monitoring, it is critical that students learn to self-evaluate performance by comparing outcomes to task criteria, rather than relying on teachers to make judgments about the adequacy of their work (e.g., "Did I get this one right?"). When performance does not achieve expectations, teachers should help students generate and record strategy revisions that might better meet task demands. Students also need to learn how to interpret teacher feedback and derive implications for future learning. Finally, teachers should guide students' attention to links between positive outcomes and strategy use to promote positive perceptions of self-efficacy and attributions to strategies.

### Small-group instruction

Research also has documented SCL efficacy when adapted for small-group instruction (Butler, Elaschuk, et al., 2000). In small groups, instructional activities generally parallel those in individual instruction. However, one difference arises in terms of how a task is selected. If a small group is drawn from a whole-classroom setting, then task selection is straightforward, given that students tend to work towards similar goals (e.g., writing a narrative paragraph). But if small groups are formed in a pull-out or support setting, then the teacher and students must negotiate a common focus as well as authentic task examples (studying for Nick's science test). In the Butler, Elaschuk, et al. (2000) study, students chose a common task (reading and studying) and then took turns addressing class assignments. Results showed that students successfully co-constructed strategies whether working on their own or another's assignments. In fact, students reported that developing strategies was easier when they were released from the pressure of their own work. They also enjoyed providing advice to other students because it made them feel more competent.

A second difference between one-on-one and small-group instruction arises from the addition of peer interaction. In one-on-one instruction, teachers provide the social context in which students co-construct strategies, but in small-group discussions teachers facilitate discussions within which students share ideas. As in one-on-one instruction, the teacher's role is to observe students' approaches to tasks and ask questions that guide students' self-regulation. But small-group discussions also promote students' transactional construction of knowledge about learning. Knowledge constructed transactionally (among teachers and peers) is more sophisticated than knowledge a student might construct on his or her own (Pressley et al., 1992). Students also gain opportunities to observe how personalized strategies can be constructed to meet individuals' needs.

### Whole-classroom instruction

The final column in Table 1 describes how SCL can be adapted for use in a whole-classroom setting. Most SCL instructional principles translate easily into whole-classroom settings. In classrooms students can be engaged in large- or small-group discussions that promote co-construction of transactional knowledge about learning. However, a unique feature of classroom instruction, when compared to pull-out or support settings, is that classroom teachers are the ones who set tasks and articulate performance criteria. As a result, teachers have the opportunity to integrate instructional activities that promote self-regulation into the structure of classroom assignments.

Most teachers recognize, for example, that even when they define assignment expectations explicitly (verbally and/or in writing), many students fail to follow instructions. A common problem is that students do not know how to analyze tasks or use instructions to self-direct learning. To support task analysis, teachers might lead whole-class discussions focused on defining performance criteria (e.g., "What would I look for when marking this assignment?"). Alternatively, students could be asked to interpret assignments individually or in small groups. Where applicable (e.g., for a writing assignment or a history report), students could be asked to submit criteria lists in preparation for tackling an assignment. Asking students to submit criteria lists affords opportunities for teachers to diagnose individuals' misunderstandings.

Similarly, to promote strategy development, teachers can facilitate whole- or small-group discussions in which students share ideas about strategies (that might best meet task demands). Students could try out selected approaches when they complete an assignment. Alternatively, teachers could complete a task collaboratively with small or large groups of students (e.g., collaboratively solving a math problem, brainstorming ideas for an essay). Attention could shift between completing the task and the process of task completion. Using either approach, an important follow-up activity is for students to articulate strategies they plan to use in the future. Asking students to articulate strategies supports their construction of metacognitive knowledge. Further, when students submit strategy descriptions, teachers gain insight into individuals' approaches to learning and can provide feedback on learning processes—not just products.

Multiple approaches also can be used to promote self-evaluation and self-monitoring. For example, after her students submitted an essay assignment, one English teacher rewrote the topic on the chalkboard and then listed (anonymously) five topic sentences from students' essays. As a group, the class evaluated each topic sentence to define (a) qualities of a good topic sentence, and (b) possible strategies for writing them. Another English teacher created a strategy form that students revised and turned in across a sequence of writing assignments. In a first column students described each assignment in turn (e.g., writing a first narrative paragraph). In a second column students outlined the strategies they planned to use to complete that row's assignment. In a third column, students interpreted teacher feedback on each assignment in light of specific task criteria (generated in a class discussion before starting the project). In a final column, students recorded ideas they had about how to improve their performance for the upcoming assignment.

In sum, a challenge that confronts classroom teachers who wish to individualize instruction is that they need to divide their attention across many students at once. Thus, it is more difficult for them to assess individual needs and/or to provide one-on-one guidance of students' cognitive processing. But, as described above, teachers can (a) use procedural facilitators that guide cognitive processing to foster student success, coupled with interactive discussions that require students to make sense of learning processes, (b) engage students in interactive discussions about tasks, strategies, and monitoring, (c) require students to articulate and submit descriptions of emerging understandings as part of class assignments, (d) provide individualized feedback on task performance and students' learning processes, (e) require students to interpret feedback to provide direction for subsequent performance, and (f) vary instruction to include large-, small-, and one-on-one structures within which peers and teachers mediate students' cognitive processing.

## Conclusions

A main focus in this article is on detailing how multiple theoretical strands were integrated to form recommendations for practice and Strategic Content Learning instructional principles. To summarize, SCL fosters students' mindful reflection on learning to promote distillation of new knowledge (Wong, 1994), while at the same time recognizing how knowledge construction is shaped within sociocultural contexts (Englert, 1992; Harris & Pressley, 1991; Vygotsky, 1978). Rather than providing direct instruction about predefined strategies, in SCL teachers provide calibrated support that assists students to self-regulate learning effectively (Butler, 1998a; Palincsar & Brown, 1988). This is accomplished by supporting students' engagement in iterative cycles of task analysis, strategy development, and monitoring. While working through tasks, students co-construct personalized strategies that are described in their own words. And, by associating improved outcomes with effortful strategy use, students build self-perceptions of self-efficacy, positive attributional beliefs, and a sense of control over outcomes. The convergence of these multiple instructional components is expected to promote students' ownership and transfer of strategies. Simultaneously, the goal is for students to learn *how to* construct strategies independently when confronted with academic work.

Substantial empirical evidence validates SCL efficacy when applied to support students with learning disabilities in secondary and postsecondary settings. Follow-up research is underway to evaluate SCL efficacy in whole classrooms (see Butler, Novak, et al., 2001), when used as a model for peer tutoring, and when applied for students with varying needs. Additional research also is required into SCL efficacy with younger students. Nonetheless, existing evidence suggests that teachers could profitably employ SCL to individualize instruction in self-regulation in high school, college, and university settings.

## Note

1. The research described in this article was supported in part by a Standard Research Grant (#410-95-1102) from the Social Sciences and Humanities Research Council of Canada. Correspondence concerning this article should be addressed to Deborah L. Butler, Department of Educational and Counselling Psychology, and Special Education, Faculty of Education, University of British Columbia, Vancouver, BC, Canada V6T 1Z4. Phone: (604) 822-0575. Fax: (604) 822-3302. E-mail: deborah.butler@ubc.ca.

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