What We Really Know about Strategy Instruction

Powerful strategies for improving students' learning are available to teachers, but the conventional wisdom about which ones are effective is not always supported by research.

On a Monday morning last spring, a 2nd grade teacher taught a class of bright underachievers at Benchmark School near Philadelphia how to summarize an excerpt from their social studies text. This teacher believed his students' comprehension would be improved if they could sum up what they had been reading. That same morning, a 1st grade teacher in Madison, Wisconsin, taught her class to subtract by counting down from the larger number to the smaller. She felt this strategy would improve her pupils' understanding of subtraction. Later in the day, a group of 3rd grade students in East Lansing, Michigan, watched their teacher "think aloud" as he read a story to the class: when he did not understand the text, he reread it, looking for clues to its meaning.

All these teachers were teaching *strategies*: procedures for accomplishing academic tasks. Strategies can enhance student performance in reading, composing, computation, and problem solving.

We realize now that many students do not learn strategies automatically. This assertion may be startling, especially to those who know the "classic" literature on children's use of simple memory strategies. For instance, preschool children typically do not rehearse when asked to learn lists of items (e.g., *apple, car, dog, grass, bottle*)—that is, they do not say the words over and over in order. In contrast, 11 and 12-year-olds do. Thus, many commentators have concluded that autonomous use of strategies develops between 4 and 12 years of age. But even in adults, the development of some strategies is observed infrequently, for example, the use of self-questioning to learn facts (Pressley et al. 1988b). So we've found that our earlier assumptions were not accurate.

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And we've also learned a partial explanation for the dearth of strategy use: many people do not know strategies because their teachers, unlike those in the opening paragraph, don't teach them in school. Researchers find little strategy instruction in classrooms (see Pressley et al. 1989a). Information about strategies is rarely included in textbooks either, despite the growing database on strategies applicable to school tasks.

The Status of Strategy Instruction

Is cognitive strategy instruction really developed well enough to distribute to schools? The answer is complicated. Some school tasks and academic strategies have been studied much more thoroughly than others. On one end of the continuum is reading comprehension, which has been the concern of many reading researchers and educational psychologists. Quite a few read-

ing comprehension strategies have been evaluated in true experiments, and about half a dozen have been found to improve memory and comprehension, at least for some children. These include summarization, imagery, story grammar, prior knowledge activation, self-questioning, and question-answering strategies (Pressley et al. 1989b) (see fig. 1).

Today's researchers are energetically investigating the matter of essay-construction strategies, aimed at affecting the entire planning, translating, and revising cycle that constitutes skilled writing (Harris et al. in press a). Englert, Raphael, and their colleagues at Michigan State are completing the evaluation of a strategy-instructional package that fosters the development of mature composition skills in elementary school children. Karen Harris, Steve Graham, and their associates at the University of Maryland have validated both a self-instructional strategy training approach and a set of strategies that promote effective writing (cf., Harris and Graham 1985; Graham and Harris 1989a, 1989b). For example, Graham and his associates (1989) produced striking improvements in the compositions of 11- to 13-year-old learning-disabled students. They taught these children a particular method for setting writing goals, generating and organizing notes in anticipation of writing, continued planning as writing proceeds, and evaluation of goal attainment.

So, some powerful strategies appropriate to particular academic goals and populations have been developed. However, *much* more research is required before a full panorama of well-validated strategies will be available.

Although this may come as a surprise to teachers, many strategies endorsed by curriculum and instruction publications represent only conventional wisdom about the nature of teaching and learning and have never demonstrated their worth in objective experimental evaluations. Take, for example, the presumed benefits of semantic-context strategies for acquisition of vocabulary-definition associations. Teachers are typically advised to teach students to use new words in context, that is, to construct meaningful sentences containing new vocabulary, to generate synonyms, or to practice semantic mapping of a word, including specification of related terms and opposites. These methods of vocabulary acquisition share one problem, however: They do not work. Quite a few experiments conducted during the last 15 years compared these methods to that of simply giving students words and their meanings to study. None of the semantic-context procedures produced better learning of vocabulary-meaning associations than the no-strategy control procedures (see Pressley et al. 1987). Many strategies that have traditionally been recommended simply lack research support.

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Methods of Teaching Strategies

It is very difficult, based on the available research, to make definitive statements about how to teach strategies, but some guidelines can be stated. Ideally, most researchers agree, cognitive strategies should be taught in conjunction with content and in response to learner needs and capabilities.[1] Thus, before they begin strategy instruction, teachers should take affective, behavioral, and cognitive assessments of learners as they attempt the target task (Harris 1982, Harris et al. in press, Graham and Harris 1989b, Wang and Palincsar 1989). Once a task-appropriate strategy that matches a student's abilities has been selected, the teacher and the student should establish the potential benefits of that strategy, the goals of strategy instruction, and how and when to use the strategy (e.g., Brown et al. 1981, Pressley et al. 1984b, 1985).

Teacher modeling and self-regulated use of the procedure lie at the heart of good instruction. The teacher demonstrates the use of the strategy in the context of meaningful academic tasks and introduces strategies one or a very few at a time (that is, teaches one or two strategies over the course of several weeks or months). At first students may not "get it," at least not completely, but they will be able to start trying the procedure. The teacher guides their initial attempts, providing many prompts at this point about what to do and when to do it and tailoring

Fig. 1. Tried and True Reading Comprehension Strategies

The following half-dozen strategies have been found to improve children's memory and comprehension:

Summarization: Creating a representation of gist.
Imagery: Constructing an internal visual representation of text content.
Story grammar: Identifying the setting, problem, goal, action, and outcome in a narrative.
Prior knowledge activation: Relating what one already knows to the content of text.
Self-questioning: Generating questions that integrate across different parts of a text.
Question-answering: Teaching students to analyze questions as a part of trying to respond to them.

Strategic Reading

In *Strategic Teaching and Learning: Cognitive Instruction in the Content Areas*, Beau Fly Jones and her colleagues seek to apply knowledge of the learning process to methods of instruction in all content areas, to benefit both high- and low-achieving students. Their approach, strategic teaching, focuses on the role of the teacher as a model and a mediator and recognizes the dual agenda of teaching both content and strategies.

Part I of the book describes the framework of strategic teaching and the editors' working conclusions about learning and instruction. Part II tests this application of strategic teaching in science, social studies, mathematics, and literature.

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feedback and re-explanations of the strategies to individual student needs.

Gradually the teacher transfers control of strategy performance to the student; the student assumes responsibility for recruiting, applying, monitoring, and evaluating the strategy over a number of sessions, with the teacher ready to intervene with additional instruction if difficulties arise. Throughout the instructional sequence, the teacher fades input at a pace permitting competent performance by the student. Strategy instruction is "scaffolded" (Wood et al. 1976), to use a term that is popular today. Student progression is criterion-based rather than time-based (Graham and Harris 1989a), with teaching and interactive practice continuing until the student understands the strategy and can carry it out.

Good strategy instruction is interactive: students should collaborate in determining the goals of instruction as well as in the implementation, evaluation, and modification of the strategy and strategy acquisition procedures (Harris and Pressley in press). In short, the teacher helps students to understand what they are learning and why they are learning it.

Teaching for Transfer

Once a student can carry out a strategy independently with instructional tasks, the challenge is to teach him or her to use the technique consistently for appropriate tasks. One way to do this is to have students apply strategies across the curriculum. Thus, the students can use variations of summarization strategies taught in reading lessons to increase comprehension and recall of science and social studies texts; similarly, students can apply planning-translation-revision writing strategies (like the one being investigated by Graham and Harris 1989a, 1989b; Graham et al. 1989) whenever they are required to write a multiple-paragraph essay.

Throughout instruction, students need to see evidence that the strategies they are learning really do lead to improved performance. Nothing motivates students to use a strategy like seeing that the strategy increases competent completion of an important task (Pressley et al. 1984a, 1984c, 1988a).

But simply being motivated to use a strategy is not enough. Students must learn where and when a strategy can be deployed profitably (e.g., O'Sullivan and Pressley 1984). Such information can often be provided by teachers or peers, although students sometimes discover this type of metacognitive information about strategies on their own (Pressley et al. 1984b, 1985). Teachers should do everything possible to encourage the development of this knowledge. They can prompt students to apply strategies or provide assistance to students in adjusting the strategy. Use of the strategy throughout the school day and across the curriculum can be encouraged by cueing strategy use, by re-explaining strategic techniques, and through additional teacher modeling of strategy use; in other words, by "coaching" (Schon 1987).

What's Next?

Although we have learned a great deal about how to teach strategies, we are on the verge of new discoveries. Teachers like the ones we mentioned in Pennsylvania, Wisconsin, and Michigan are providing new information about which strategies are really useful to students, how students master particular strategies, and how misunderstandings can be corrected when they occur. Many more specific recommendations will follow as research on strategies proceeds.[2] But we know enough now to begin to offer students these profitable and helpful avenues to learning.□

[1]A set of procedures, components, and characteristics common to effective strategy instruction can be seen in the work of such researchers as Donald Deshler, Jean Schumaker, and their associates at the University of Kansas; Laura Roehler, Gerald Duffy, and their colleagues at Michigan State University; Karen Harris, Steve Graham, and their coworkers at the University of Maryland; Michael Pressley at the University of Maryland; John Borkowski of Notre Dame; and Wolfgang Schneider at the Max Planck Institute.

[2]See Pressley et al. (in press) for an example of such research as well as further discussion about how such inquiries can affect future instruction.

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