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Research Notes

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Engaging Strategies for All Students: The SpringBoard® Example

Jane Delgado

Introduction

In order to meet the needs of all students and to discover the most effective educational models for students who learn in different ways, researchers have investigated a variety of educational models, some empirical and some theoretical. Added to these more formal approaches are the efforts of thousands of teachers at all educational levels who are engaged in the action research that informs the effective classroom. Dedicated teachers, day after day, try various approaches with a wide variety of students, implementing those techniques that are effective and abandoning the ones that don't work. They seek out new information from academic sources and their colleagues so that they can incorporate and evaluate those new ideas that seem promising. A model of learning is needed to evaluate what works and to communicate these findings. As we identify particularly effective instructional approaches from all the sources above, cognitive learning theory can provide a framework of understanding that will organize and explain what good teachers already know: all students are active learners engaged in a dynamic interaction with the forces in their environment, and with the right guidance, they can be taught strategies and helpful approaches that will allow them to take control of their own learning and continue to build knowledge and skills with increasing effectiveness.

An instructional program that incorporates much of what research shows is effective for active and strategic learning is the SpringBoard™ program developed by the College Board for students in middle school and high school. In the following review, a case is made that SpringBoard builds upon the research in cognitive learning theory as it embeds well-researched strategic approaches to learning in a rigorous curriculum in English language arts and mathematics. SpringBoard draws upon the learning sciences to provide a flexible instructional program that enables teachers to differentiate instruction and engage a diverse population of students with varying levels of knowledge and skills and a variety of preferred learning styles.

First, a model of learning based on cognitive science is outlined with particular attention to the role of memory and language. The instructional framework of strategic learning that follows from this model provides the basis for the SpringBoard program's incorporation of rigorous content and training in strategic activities and skills. Finally, the research base for the SpringBoard program is reviewed and summarized, first for the program overall and then for each set of strategies incorporated in the instructional design: reading, writing, oral proficiency, collaboration, and problem solving.

Cognitive Models of Learning

Cognitive models of learning assume that individuals engage in a process of making meaning from the rich variety of stimuli they perceive as they encounter the world. All new information is perceived through the patterned schematic filter that, in educational terms, is referred to as a student's "prior knowledge." Cognitive learning is defined as the process of comparing, selecting, organizing, retaining, and reflecting on the new information as patterns of understanding are revised and adapted. According to the research, effective learners are characterized by the width and depth of the techniques

available to them for use in this never-ending search for meaning and understanding. Because learners benefit from using strategies, researchers have attempted to identify what makes specific strategies effective for different learners across a wide variety of learning environments. Studies have been conducted with elementary school through college students, as well as older adults. Strategic approaches to learning have been researched with high-, low-, and general-ability students as well as groups of students who are learning a new language or have special needs (Rosenshine, Meister, and Chapman, 1996). Striking similarities have emerged across all the groups, with certain recurring findings that are consistent with the theoretical basis of cognitive learning theory. For the most part, strategies are effective and can be learned and utilized effectively by all students. Learners demonstrate significant differences in how they adopt, activate, and progress toward successful and automatic use of strategies, and these effects may often be explained through understandable differences in prior knowledge, opportunities to learn, and preferred learning styles (Case and Taylor, 2005; Hattie, Biggs, and Purdie, 1996).

Memory

Critical to cognitive learning theory is an understanding of the architecture of the human memory. Cognitive psychologists have distinguished between three levels of memory that appear to have distinct functions during the process of learning (Atkinson and Shiffrin, 1968; Butterfield, Hacker, and Albertson, 1996; Kirschner, Sweller, and Clark, 2005; National Research Council, 2000). Short-term memory has a limited capacity that restricts the amount of information that can be held at any one time. Facts and data stored in short-term memory are retained for only a short period without rehearsal and repetition. Working memory, also limited in its capacity to hold information, is the framework within which most manipulation and processing of information takes place. However, if the information is not integrated with the knowledge structures that organize long-term memory, knowledge degrades quickly and is lost.

The optimal instructional plan is flexible enough to allow differentiation in response to a student's capacity to apply existing strategies. Good instruction reflects an understanding of the procedures necessary to optimize the most effective cognitive "load" for each student during active learning. The goal of instruction is to "give learners specific guidance about how to cognitively manipulate information in ways that are consistent with a learning goal, and store the result in long-term memory" (Kirschner et al., 2005). Many of the strategic learning processes that have been studied and have been found to be effective are designed to facilitate the "depth of processing" that makes these connections and restructures long-term memory to accommodate new understandings. Deeper processing of new information creates multiple associations with existing knowledge structures in long-term memory. A richer network of relevant associations supports increased retention and retrieval of new knowledge and skills. While information is being processed in working memory, existing understandings stored in long-term memory are activated; new information is analyzed, compared, modified, and connected to existing knowledge structures producing new understandings. If new information is not rapidly associated and incorporated into long-term memory, working memory reaches capacity and information processing begins to break down. This is the case when a learner is faced with a lot of unfamiliar information at one time and the learner has not had previous opportunities to develop helpful organizing structures—variously called schemata, frames, or episodes—that facilitate incorporating the new information into long-term memory (Butterfield et al., 1996).

The engine that drives this process is the dissonance that occurs when we are confronted with new facts, procedures, or concepts that don't slide easily into our existing knowledge framework. Our human response will be the urge to resolve the discrepancy and reconcile the new information. The most effective classrooms provide the challenges, opportunities, guidance, tools, strategies, climate, and successful experiences that will support students and help build the motivation to persist in this effort.

Language

Cognitive models of learning are inseparable from issues of language and language proficiency. All new information and experiences are filtered through the available communication tools. Academic language abilities define the parameters that configure thought and memory; allow new information to be perceived and comprehended through listening or written text; and enable new understandings to be discussed, elaborated, expressed, and summarized in oral and written forms. Many of the learning strategies that have been identified are related to building proficiency in some aspect of the use of language—reading, writing, speaking, and listening—in order to ensure effective processing of content concepts and skills into long-term memory (Chamot and O'Malley, 1994; Cummins, 1984).

The relationship between language proficiency and content understanding becomes even more critical and complex as students grow in the grade levels. In addition to the basic skills necessary for reading and writing in the early years, more sophisticated techniques must be utilized as core disciplinary concepts become more difficult to master and as the particular functional demands of the language associated with separate subject areas become more differentiated. Students need to know the rules that govern different genres of text as well as the particular vocabulary, grammar, forms, traditions, and styles of communication needed to excel in a subject area such as mathematics or science. Critical junctures occur throughout the educational trajectory where certain language skills and abilities must be present. For example, if not adequately prepared, students will fall behind in the upper elementary years as educational texts transition from the predominantly narrative form that is used to teach reading, to the expository format that is used to communicate content concepts. In other words, a critical milestone occurs when students are no longer *learning to read* and are expected to be competent in *reading to learn* (Pritchard and Breneman, 2000). This transition is often abrupt, unexpected, and frustrating for both students and teachers, particularly for those content-area teachers who have not incorporated instructional strategies designed to build literacy as well as subject-matter understanding.

In this context, the special needs of students who are learning English as a second language become more a matter of degree than of qualitative differences. Educational theorists who have examined programs particularly designed for language learners have used the research from cognitive psychology to find that the strategic learning approach is consistently effective (Chamot, Dale, O'Malley, and Spanos, 1992; Garcia, 2003; Gersten, Baker, Haager, and Graves, 2005; Reed and Railsback, 2003; Wiley and Deno, 2005). Chamot and O'Malley (1994) suggest four basic propositions from the research with native language speakers that they believe support the development of cognitive academic language across content areas for students who are learning a second language:

- **Active learners are better learners**. When students synthesize and organize new information and relate it to prior understandings they build cognitive linkages that improve comprehension and recall.
- **Strategies can be learned**. When students are exposed to positive learning experiences where strategies are applied effectively they retain more understanding than students who have not had similar exposure.
- **Academic language learning is more effective with learning strategies**. English language learners will learn new language and concepts through the same principles that underlie acquisition of new skills and problem-solving techniques among native speakers of English.
- **Learning strategies transfer to new tasks**. Once the strategic expertise is acquired students will be able to apply the skills to new tasks that are similar to the learning activities they have experienced.

Strategic Learning Framework

Much of the energy and attention that has accompanied the strategic learning research is the result of the findings that strategies can be learned and effectively applied by a wide range of learners. Although the research on the transfer of strategies to new tasks is just beginning, the results are encouraging for those who are responsible for designing instructional programs.

According to Chamot and O'Malley (1994), strategic instruction is envisioned as an ongoing process with five general phases that shift the responsibility of the application and utilization of strategies from the teacher to the student. The role of the teacher and the instructional plan is critical in supporting the transition of responsibility to student control. As new content and new skills and tasks are encountered, the teacher first *prepares* the students by activating background knowledge. In phase two, the teacher *presents* the appropriate strategies, explains their use, and models the application of the technique related to the new content information. During the *practice* phase, the amount of guidance provided by the teacher can be adjusted to match the students' experience with the strategy or individual differences in the capacity to process information in working memory. Students are encouraged to become self-aware during the *evaluation* phase as they reflect on the success of the learning and strategic applications. Finally, the *expansion* phase encourages the transfer and application of the new techniques and abilities to new situations and tasks.

Consistent with cognitive theory, this transfer of responsibility is dependent on the students developing the ability to monitor, control, and regulate their own learning as teachers fade or withdraw the instructional supports or scaffolds. This ability to direct learning is exercised in two ways: automatically—in long-term memory as new skills are absorbed; and deliberately—in working memory as choices are made about the existing knowledge to tap and the strategies to apply.

Strategies and Content-Based Instruction

In characterizing the various strategic approaches, researchers distinguish between *cognitive, metacognitive,* and *affective* strategies. Cognitive strategies facilitate learning by providing general guides for information processing. Students may benefit even though they may not be self-aware as they utilize the technique. As self-regulation increases and control and monitoring of learning become deliberate, the student builds the capacity to choose from different approaches. Strategies that build this awareness through the discussion and written documentation of the thinking behind the choices are considered metacognitive. Affective strategies are those that deal with the feelings and human interactions that accompany and support the learning experience. Strategies that build motivation, feelings of efficacy, and collaborative skill can all be considered affective in nature.

All strategies share the instructional goals of facilitating the understanding of subject-matter content, building knowledge, and accomplishing conceptual change when needed. As such, they are most effective when embedded in an articulated instructional program where new strategies can be introduced over time following a sequence of increasing complexity, progressing in manageable steps with opportunities to repeat and elaborate on the skills being practiced (Wilson and Myers, 1999).

The instructional plan must provide for flexibility and differentiation in order to address the needs of all students. Most strategies work equally well for all students. However, flexibility is necessary in determining—for each student or groups of students—those approaches that have been mastered already and are under the control of the students' metacognitive processes and those that are still in need of practice and elaboration. In the optimal instructional situation, teachers can choose the best approach for students who learn in different ways as well as decide to increase or reduce the amount of guidance and the level of scaffolding to apply to specific instructional tasks. The strategic approach for a group of expert learners may be characterized by a higher level of student control and minimal guidance, while the classroom of younger, struggling, or novice learners may involve more direct instruction, explanation, and modeling of strategic activities by the teacher (Kalyuga, Ayers, Chandler, and Sweller, 2003; van Gog, Ericsson, Rikers, and Paas, 2005). Different classroom environments in this instructional context—characterized by collaboration, discussion, active reading, writing, and various graphic or visual organizing activities—may appear very much the same to the outside observer regardless of the various learning levels within.

The SpringBoard Example

The College Board's recently developed SpringBoard program takes advantage of years of research in cognitive science to support the design of an instructional program in mathematics and English language arts that successfully engages all students in challenging learning experiences. The program meets the criteria for strategic instruction outlined above:

- Rigorous content, aligned to standards, has been carefully articulated in a scope and sequence that builds knowledge and skills incrementally from sixth grade through twelfth grade in both English language arts and mathematics. The content is mapped to standards that will prepare students, upon completion of the six-year sequence, with the level of knowledge, skills, and abilities necessary for success in Advanced Placement Program® courses and college.
- Embedded in each lesson, and at the discretion of the teacher, are numerous opportunities to introduce, model, and then practice and evaluate the application of research-based strategies in reading, writing, oral proficiency, collaboration, and problem solving. The strategies can be revisited and practiced throughout the entire articulated sequence across the grade levels, and the teacher version of the instructional materials signals which strategic approaches might be most appropriate for the task at hand, given the amount of student preparation and differences in learning styles.
- The instructional materials are grounded in real-world situations and are designed to be engaging and interactive, offering students the opportunity to master knowledge and skills in manageable steps, with tasks that require reading, writing, discussion, problem solving, collaboration, questioning, and elaboration.
- Standardized formative assessments with scoring rubrics are embedded in each lesson and, in addition, teachers have numerous opportunities to review student work, monitor student talk, and observe cognitive organization in action. Computer-based diagnostic assessments are available and can be used as is or can be customized by the teacher. The diagnostic assessment reports offer explanations for each incorrect response.

- Teachers are trained in the use of the model instructional units and strategies at professional development institutes and workshops that are designed to exemplify the strategic learning framework diagramed above. The program provides 24-hour access to materials, exemplary student work, as well as coaching and mentoring through a supporting online system.

The operational heart of the SpringBoard program is the extensive collection of model instructional units and lessons combined with the ongoing professional development and support offered to teachers in the program.

SpringBoard teachers are introduced to the strategies during the professional development institutes and workshops. SpringBoard staff developers model instruction using a subset of the lessons and units contained in the SpringBoard materials. The units used in training are selected in order to provide teachers with exposure to the variety of strategies that are embedded throughout the six levels of SpringBoard. The training is based on the same principles of strategic learning that make the instructional program powerful in the classroom. Prior knowledge is activated as the strategies are explained and then modeled for the participants. Teachers are given an opportunity to practice using the strategies as a component of the lessons being used as illustrations, while the staff developers coach and offer feedback. The process is repeated as the training continues and teachers are encouraged to continue to work with the training staff online between workshops. By experiencing the power of the strategic approach firsthand, teachers are able to envision the transfer of the process into the classroom.

The subject matter of each unit is academically quite rigorous and challenging, yet students of all ability levels are able to engage with and then master the content successfully through the utilization of the various strategies offered by the program. Each of the SpringBoard strategies has been chosen from the most effective classroom practices that have been time-tested by educators in instructional situations. Many of the strategic approaches have been researched through empirical and experimental studies as well.

SpringBoard Strategies

SpringBoard assists teachers and students in English language arts and mathematics by defining, explaining, and incorporating more than 60 separate cognitive, metacognitive, and affective strategies. For explanatory purposes, the strategies are organized into discrete groups, although there is considerable overlap in purpose and application:

- Reading strategies—23 separate strategic approaches are offered in SpringBoard
- Writing strategies—14 are offered
- Oral proficiency strategies—8 are offered
- Collaborative strategies—7 are offered
- Problem-solving strategies—9 are offered

Reading, writing, and collaborative strategies are suggested for the units in both English language arts and mathematics. Oral proficiency strategies are primarily included in the English language arts program and problem-solving strategies address the needs of mathematics. The strategies are listed in Table 1.

SpringBoard Reading Strategies Research

For decades educational researchers have been attempting to discover and document the most effective methodologies for helping students to become expert readers. In response to the advances in cognitive psychology, an ever-growing body of this research has been designed to test the effectiveness of specific cognitive strategies through experimental or quasi-experimental designs or has attempted to identify the strategic skills and abilities that characterize expert readers. Many of the reading strategies offered by the SpringBoard program have been examined in this research. For example, researchers Kim, Vaughn, Wanzek, and Wei (2004) found 21 studies since 1984 that looked at the effect of using various graphic organizers on the reading comprehension of students who were having difficulties with reading and found overall improvements.

Another popular area for study is the impact of teaching students to generate questions. Although experimental designs are rare in educational research, Rosenshine et al. (1996) were able to identify 26 studies that had both experimental and control groups and that looked at the effect on comprehension of having students generate questions from a text paragraph or passage. Consistently, students showed significant gains as measured by both standardized and experimenter-developed assessments.

Studies have examined the effect of the activation of prior knowledge (Duffelmeyer, 1994; McNamara, 2004; Paris and Oka, 1986; Pressley, Wood, Woloshyn, Martin, King, and Menke, 1992), of visualization (Clark, Deshler, Schumaker, Alley, and Warmer, 1984; Rakes, Rakes, and Smith, 1995; Willoughby, Wood, and Khan, 1994), of reading and thinking aloud (Beck and McKeowon, 2001; Magliano, Trabasso, and Graesser, 1999; Narvaez, van den Broek, and Ruiz, 1999), of summarizing and retelling (Carnine and Carnine, 2004; Jitendra, Hoppes, and Xin, 2000; Thiede and Anderson, 2003),

Table 1

SpringBoard Strategies

Name of Strategy	*ELA*	*Math*
Reading Strategies		
Anticipation Guide	X	
Chunking the Text	X	X
Close Reading	X	
Dialectical Journal	X	
Graphic Organizer	X	X
Guided Reading	X	
Interactive Reading Guide	X	
K-W-L Chart[1]	X	X
Marking the Text	X	X
Predicting	X	
Previewing	X	
Questioning the Text	X	X
Quickwrite	X	
Read Aloud	X	X
Skimming/Scanning	X	
Summarize/Paraphrase/Retell	X	X
Think Aloud	X	X
Visualizing	X	X
Activate Prior Knowledge	X	
RAFT[2]	X	
PACA[3]		X
TP-CASTT[4]	X	
SOAPSTone[5]	X	
Writing Strategies		
Dialectical Journal	X	X
Frame Poem	X	
Graphic Organizer	X	X
Manipulatives	X	X
Modeling	X	
Outlining	X	
Quickwrite	X	X
Revisiting Prior Work	X	
Self-Editing/Peer Editing	X	X
Timed Writing	X	
Transformation of Text	X	
Visual/Auditory Prompt	X	
Writing Process	X	
RAFT	X	X

Name of Strategy	*ELA*	*Math*
Oral Literacy Strategies		
Choral Reading	X	
Debate	X	
Drama Games	X	
Presentation	X	
Oral Interpretation	X	
Oral Reading	X	
Rehearsal	X	
Role Playing	X	
Collaborative Strategies		
Fishbowl	X	
Jigsaw	X	X
Literature Circles	X	
Performance	X	
Think-Pair-Share	X	X
Group Presentation		X
Debriefing		X
Problem-Solving Strategies		
Act Out the Problem		X
Draw a Sketch		X
Guess and Check		X
Identify a Subtask		X
Look for a Pattern		X
Make a Table or an Organized List		X
Simplify the Problem		X
Work Backward		X
Write a Number Sentence		X

[1] K-W-L = What I … Know, Want to Know, Learned
[2] RAFT = Role, Audience, Format, Topic
[3] PACA = Predicting and Confirming Activity
[4] TP-CASTT = Title, Paraphrase, Connotation/Denotation, Attitude, Shift, Theme, Title
[5] SOAPSTone = Subject, Occasion, Audience, Purpose, Speaker, Tone

and of chunking text material (Casteel, 1990). The research has looked at the immediate impact of the strategies as well as transfer of the skills to new situations across the content areas. Studies have also examined the effects for high- and low-ability students and found improvements at all levels.

SpringBoard Writing Strategies Research

Reading and writing abilities often benefit from the same strategies. Writing becomes the visible evidence of comprehension, and some educational researchers have focused on the strategic approach in order to offer suggestions for improvements to writing skills. Gersten and Baker (2001) summarized the research on improving the writing skills of students experiencing difficulties in a meta-analysis. They identified 13 studies that looked at the impact of strategic interventions and that also used an experimental or quasi-experimental design. They found a moderately strong average-effect size across all of the studies indicating substantial benefits from the interventions. Consistently, students needed to be instructed in the steps that were critical in producing an effective written work. For example, in one of the studies examined in the meta-analysis, Englert, Raphael, Anderson, Anthony, and Stevens (1991) found that expository writing improved in high-achieving students, low-achieving students, and students with learning disabilities after training in the writing process (prewriting/planning, drafting, revising, editing, and publishing). Graham and Harris (2005), in a series of studies over 20 years, found that if students were introduced to planning strategies as part of the writing process their knowledge about writing, their motivation to write, and the quality of their writing all improved. When students were asked to revisit their prior work and think about comprehensibility from the perspective of the audience for the piece, they were able to edit and revise more effectively (Beal, 1996).

SpringBoard Oral Proficiency Strategies Research

Oral proficiency is important in classroom discourse as well as outside the classroom, but the importance goes beyond basic conversational skills. There is evidence that oral and written language processes develop together and, as a result, improvements in oral language may have an immediate benefit for writing. Oral strategies such as story retelling, think-pair-share, and role playing provide a direct bridge to improved writing skills (Brice, 2004). Margaret Cook (2000) examined the effect of role-play with elementary students of varying abilities: high, average, and low. She found that children at all levels grew in social and cognitive skills as well as in technical vocabulary and writing ability. When adolescents were encouraged to elaborate on texts with role-play, student engagement and comprehension improved (Zigo, 2001). Educators have long relied on oral reading in the hopes of building language fluency, and oral reading strategies may be categorized according to the level of independence required of the student. Carbo (1993) offered a continuum that ranged from shared reading—listening to the teacher read—to sustained silent reading, a completely independent activity. In this framework, choral reading becomes an intermediate strategy where a small group of students read together and learn from each other. McCauley and McCauley (1992) examined the choral reading strategy with second language learners and found improved comprehension of the text. In addition to the cognitive benefits, the researchers indicated that students were also assisted by the low-anxiety environment that choral reading created. Thus, choral reading became a cognitive *and* affective strategy.

SpringBoard Collaborative Strategies Research

Educational theorists differ in the amount and character of the social interaction that is considered necessary for an effective transformation of prior knowledge into correct understanding, but the recognition that learning is fundamentally an interactive social activity has become generally accepted. As such, the decision to structure a classroom to facilitate collaborative group work and enhance the interactions required for learning is initially a teacher responsibility. However, the decision to ask for help from peers, or to combine with others for study and discussion and thereby realize the cognitive and affective benefits of collaboration, can certainly become a metacognitive strategy that is under student control (Palincsar, 2003). Researchers have examined structured collaboration in different forms and found positive outcomes for students in academic performance and attitudes. Carroll and Leander (2001) looked at the impact of graphic organizers, questioning, and cooperative learning and found improvements in comprehension and grades as well as a reduction in off-task behaviors.

One collaborative strategy that emerged from social psychological research is the Jigsaw approach, structured to make students dependent on each other for critical pieces of knowledge in an equal-status, interdependent environment. The approach has been well researched over the years, with

changes being made to the process along the way. Jigsaw has been studied with students at every level, from elementary school through college, and has consistently been shown to have a positive impact on student learning as well as social skills (Holliday, 2002; Lee, Ng, and Jacobs, 1997; Perkins and Saris, 2001; Zales, 1998).

SpringBoard Problem-Solving Strategies Research

In addition to the strategies in all of the areas above, SpringBoard offers teachers of mathematics particular assistance in the area of mathematical problem solving. Much of the research in this area makes reference to the seminal work of Polya (2004), whose book *How to Solve It* was published originally in 1945. Subsequent researchers and theorists have built upon the foundation proposed in his original work, but the four-step problem-solving process he proposed has remained recognizable throughout:

1. Read and understand the problem
2. Develop a strategy for solving the problem (a heuristic)
3. Carry out the strategy or plan. Show your work. Justify your answer.
4. Look back and check to see that the solution seems reasonable.

Step one is dependent on mathematical literacy in reading and comprehension—a justification for incorporating techniques for building proficiency in all aspects of language. Most of the problem-solving strategies that are offered by the SpringBoard program fit into steps two and three above. Researchers have studied the effect of teaching the problem-solving strategies to students and found significant improvements in their mathematical achievement (Collins, Brown, and Holum, 1991; Eshel and Kohavi, 2003; Ives and Hoy, 2003; King, 1991; Kroesbergen and Van Luit, 2003; Ostad, 1998; Pape, Bell, and Yetkin, 2003; Pugalee, 2004).

Discussion and Summary

Cognitive models of learning provide a useful framework for informing the design of an optimal instructional system. The framework incorporates decades of research on memory, information processing, and the social organization of the educational process. When learning environments that have been designed to facilitate language proficiency, cognitive processing, and the growth of metacognition are compared to more traditional or transmissive approaches, the advantages are clear—all students do better, and, in some instances, the benefits are dramatic (Anderson, 2002; Hamilton, McCaffrey, Stecher, Klein, Robyn, and Bugliari, 2003; Hmelo-Silver, 1998; Marzano, Pickering, and Pollock, 2001; Ruby, 2002; Schwartz and Martin, 2004; Stigler and Hiebert, 2004).

As a comprehensive instructional program in English language arts and mathematics, SpringBoard reflects powerful, research-based understandings about how people learn. The potential for serious engagement in the learning process by all students is enhanced by the strategic learning methodology incorporated throughout the program. All of the elements necessary for long-term skill and knowledge development in both students and teachers are envisioned as components of the system:

- Rigorous, flexible, research- and standards-based instructional materials
- A wealth of strategic approaches—cognitive, metacognitive, and affective
- Ongoing support for teacher professional development
- A commitment to inclusion and differentiation for all levels of student abilities and learning styles
- A sensitivity to real-world connections and the affective and cultural needs of a wide variety of student populations

The foundational instructional element of the SpringBoard program is the recognition that in order for students to truly incorporate rigorous new information so that it may be used and transferred to new situations, the pedagogy must reflect strategic techniques that facilitate depth of processing and comprehension. Strategies work because they structure the cognitive manipulation of information in a way that changes the architecture of the memories in the human brain. They work because they can be learned and brought under the control of the learner so that future information is easier to absorb. If the environment of the classroom does not allow for this interchange between the flow of information and the need of the student to process, practice, reflect, and integrate new ideas through language and experiences, learning stops. Exemplary learning programs such as SpringBoard are designed to provide the support that teachers need in order to empower all students to meet new educational challenges with skill, enthusiasm, motivation, and confidence.

Jane Delgado is a research scientist at the College Board.

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45 Columbus Avenue
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