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Leveling the Playing Field for All Students

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KEY CONCEPTS

- Thinking Maps® as tools for developing students' executive functioning and metacognitive Habits of Mind
- A revealing story of the transformation in writing processes, executive functioning, and performance of one student with special needs
- Improving writing, oral language, and thinking processes in unison

Those of us who are fortunate enough to work with children often find ourselves forever changed by relationships with one or two of them. My life took a definite turn when I met David. He taught me that the mind of an eight-year-old is capable of much more than I had previously thought, and that even children with severe learning disabilities can learn to play the game of school as well as or better than their nondisabled classmates. Through David, I learned just how powerful Thinking Maps can be, and I saw how profoundly they can change a life. Thinking Maps not only got David back in the academic game; they also leveled the playing field so that he could emerge as a leader in his classroom.

As a speech-language pathologist in private practice, I have the luxury of being able to work with any student who struggles with language, literacy, or learning. In addition to David, I have had the opportunity to use maps with countless other children who are not diagnosed with learning disabilities but just have trouble learning—the so-called underachievers. Though each story is unique, similar themes emerge from the students and whole schools I have taught to use Thinking Maps. As a result, David's story is worth telling, for it offers us insight into many children who struggle with school and inspires new hope for their futures.

THE STORY OF DAVID

I remember vividly the day I met him. A small second grader with a chip on his shoulder, David sat down at my table, pulled a stack of crumpled papers from his backpack, and exclaimed with indignant exasperation, "Look at what she gives us!" He slapped a stack of graphic organizers on the table with a dramatic flair. "These are stupid," he declared, "and they don't help. I hate writing, and I'm not doing it!" On the table were five graphic organizers—variations on a typical web-style map. Although they had different shapes, they all depicted the same visual configuration: a circle centered on the page with ovals or lines radiating from it like spokes on a wheel.

This particular set of webs was given to David by his teacher with the intention that they would guide him with planning and writing a story. Attempting to use the only strategies available to him, he dutifully filled in each graphic. In the end, he had five webs on his desk. Rather than help him write his story, they overwhelmed him with information that neither looked like a story nor helped him order his thinking so that he could generate one. As a result, he gave up. This experience reinforced his already growing belief that he wasn't and would never be a good writer, and it strengthened the bad taste he had in his mouth for writing.

Historically, David had always had difficulty producing more than a sentence on his own. His motor skills were compromised, so handwriting was an arduous process for him. By second grade, he was identified as a child who wasn't making academic progress, so he was provided with support from the learning specialist in his school. Though he struggled academically, David was quite talented in some areas. His verbal IQ was 139—in the superior range, as measured by the third edition of the Wechsler Intelligence Scale for Children (WISC-III). But his visual-spatial skills were not nearly as well developed, as evidenced by his below-average WISC-III performance IQ of 86. Overall, his developmental profile, with a significant (53-point) discrepancy between verbal and visual-spatial abilities, indicated a nonverbal learning disability along with attention deficit hyperactivity disorder (ADHD), for which he took medication. The school psychologist who evaluated him reported that he had difficulty with visual discrimination, motor planning, attention to visual details, and visual-spatial construction. Further, he noted that it was particularly difficult for David to see the relationship of parts to the whole in nonverbal tasks and that he "may need help with sequencing, prioritizing information, and strategies to see the 'big picture' or how details relate to a bigger concept."

David could describe his problem with writing. He had trouble with handwriting, and he didn't know how to plan his ideas or start a piece of writing. Webbing strategies didn't help him, because he couldn't determine which idea on his web should go first. Nothing in the visual structure of a web suggested a good place to start. I suggested to David that his teachers were trying very hard to help him with writing but they weren't using a graphic that worked very well for his brain. Despite his vehement protests that "graphics don't work," I introduced him to the Flow Map, a Thinking Map for sequencing ideas. Together, we generated ideas for a story, while I modeled how to map them out sequentially. Afterward, I asked David if he thought he could write the story using the ideas on our map. "Sure," he quipped confidently, and he quickly drafted a lovely little story. The next week, I began to scaffold the use of the map, starting a new Flow Map, and he finished it and used it to write another story. Over the next few weeks, David practiced making Flow Maps with me before doing his story-writing homework. His attitude toward story writing slowly began to shift as he learned a simple technique that allowed him to see his thoughts before he wrote within a visual structure that looked like the discourse he was attempting to generate. After a break for summer vacation, I asked David if he remembered the Flow Map. He quickly drew a blank map, while cheerfully explaining what it was used for, how

to make it, and how to use it for writing. With this visual image now rooted in his mind, narrative writing ceased to be a problem for him. So did his sour attitude about writing.

GAINING FLUENCY

Over time, as David became more fluent with the maps, his demeanor changed. Though his visual-spatial skills were indeed compromised, he was a quick study. With direct instruction and a good deal of guided practice, he learned the visual array of the maps and the pattern of thought each map represented. I realized we had turned a corner when his mother found him on the couch on a Saturday making a Flow Map of his day. The frustrated, angry, and resistant boy who had first walked into my office evolved into an enthusiastic, creative, and self-confident boy who was truly excited about learning and said "Thank you for teaching me" at the end of each session. David had learned a new language—a language of thinking. It was both a visual language and a verbal one. This language paved the way for explicit consideration of how, when, where, and why to apply specific thinking strategies to support his schoolwork.

In our second year of working together, David became so confident about his ability to think that when we had extra time in a session he began to make up Thinking Map games. We took turns creating problem scenarios and quizzing each other on how we would need to think to solve them. Here, he demonstrated that he had truly developed an awareness of his thinking and internalized the language of the maps, as he reported ways to use them that I had never taught him. The maps were now truly tools for thinking, learning, and problem solving, and these tools established a level of metacognition that I had never before seen in a child his age.

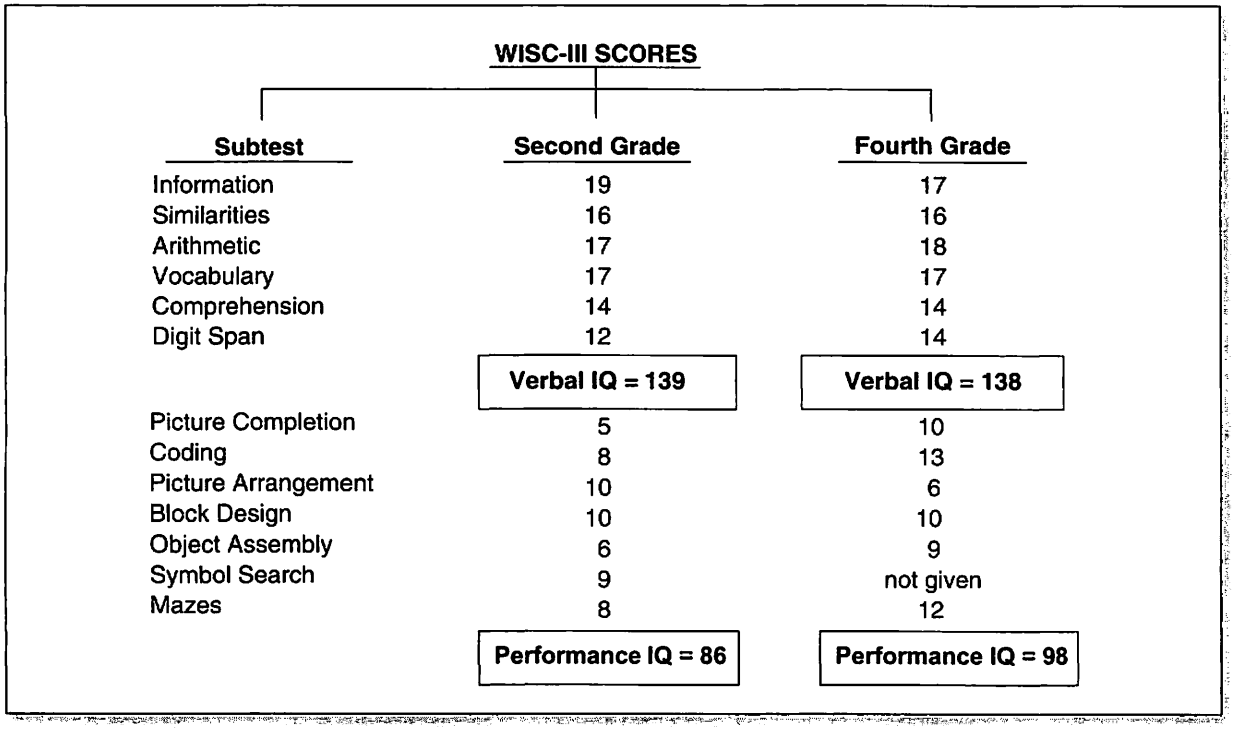
At the end of fourth grade, David had an updated neuropsychological evaluation before he moved away to another state. His WISC-III verbal IQ remained in the superior range (138), and his nonverbal IQ score rose 12 points (to a score of 98) from the below-average to the average range, as shown in Figure 3.1. Interestingly, significant gains were evident in some key areas of cognition—namely, his attention to visual detail and his ability to perceive part-whole relationships, integrate information, and plan and organize an approach to a task. In our two years of working together, we used Thinking Maps to develop each of these skills in natural and authentic learning contexts. When David moved and began to receive special education services, his learning-center teachers could not determine what was wrong with him. Despite significant cognitive discrepancies, he was metacognitively, motivationally, and behaviorally active in his own learning process, which masked the severity of his learning disability and allowed him to function on par with his peers.

At this point, David still had a significant discrepancy between his superior verbal skills and his average nonverbal abilities, but his presentation as a learner was dramatically different. First and foremost, he *knew* how he was thinking and could identify what kind of thinking any task demanded of him. As a result, he was highly self-regulated. He demonstrated the three defining features of self-regulated learning (Zimmerman, 1989): the ability to self-monitor, self-evaluate, and self-adjust. He had an arsenal of strategies that he could employ in any learning situation, and he readily employed them when tasks demanded complex thinking. Consequently, his self-efficacy for any learning task—even writing—was tremendously strong. David moved from being stuck on the bench to being a varsity player when it came to school.

WHAT CAN WE LEARN FROM DAVID?

What's interesting about David is that his story is representative of other students who learn Thinking Maps and who have special needs or are underachieving academically. This raises the question of what the maps do for children's minds. Clearly, the maps did not get rid of David's nonverbal learning disability or his attention deficit disorder. We know that such

Figure 3.1 David's WISC-III Scores Before and After Thinking Maps



disabilities are lifelong, and his cognitive profile remained indicative of these disorders even after becoming proficient with the maps. However, the Thinking Maps did significantly affect his cognition as well as other things that aren't measured through standardized tests, namely his *meta*cognition and his day-to-day performance in school. Consequently, they affected his approach to problem solving, his enthusiasm for learning, his willingness to participate, and his beliefs about himself as a learner.

Over the years, I have used Thinking Maps with students who are underachieving academically and with those who have a wide range of disabilities (including cognitive deficits, language disorders, nonverbal learning disabilities, Asperger syndrome, high-functioning autism, and ADHD. I have yet to encounter a student who cannot learn the maps or use them in productive ways. The question remaining, then, is what exactly do the maps do for kids who struggle?

Seeing Patterns for Organization

First of all, the maps help kids see patterns. As Caine and Caine (1994) note, "The mind is a pattern detector." Many students who struggle in school do so because they fail to detect or intuit patterns. They don't see how what they did yesterday links to what they are doing today. They don't see the patterns of information that are laid out in a chapter or presented in a lecture. And, like David, though they may know a lot, they don't see how to pattern what they know in order to write or tell someone about it. Their failure in school, in part, stems from a fundamental difficulty with representing their thoughts.

Failure to invoke patterns for representing thought frequently results in disorganization. We see this very clearly in students who have ADHD. Individuals with ADHD have trouble with a range of abilities that are subsumed under the umbrella term *executive functions.* When we say someone has difficulty with executive functions, we mean he or she has difficulty planning an approach to a task, organizing a sequence of actions or series of data points, holding action sequences in working memory until they are executed, inhibiting actions that are irrelevant to

the task at hand, deciding what to attend to and what to do, shifting when necessary, monitoring and evaluating his or her behavior, and adjusting his or her behavior and emotions in response to perceived success or failure (Denckla, 1998; Singer & Bashir, 1999, in press). In essence, these are the cognitive abilities CEOs tend to be good at.

Students with ADHD, by definition, have compromised executive functions, because attention and executive functions are governed by the same part of the brain. However, students *without* ADHD can also have executive function problems. As a result, disorganization is a common characteristic of a broad range of learning disabilities as well as general underachievement. Thinking Maps allow students to see patterns that go beyond the word or sentence—patterns that capture the big picture. They offer students with varied learning abilities and learning styles a means for organizing their thinking and their understanding of the world. Further, they provide a vehicle for such students to represent and share what they know and understand.

Language for Learning: Supporting Oral Communication

In viewing how students represent what they know, the central role of language warrants consideration. Vygotsky (1962) asserts that language and cognition are inextricably intertwined (also see Chapter 6, "Maps for the Road to Reading Comprehension"). Cognition is limited by language, and vice versa. It is nearly impossible to solve a complex problem without an internal conversation—without talking your way through it. Educators want students to become better thinkers, and they depend upon listening, speaking, reading, and writing (to a far greater degree than other representational systems) for developing as well as assessing student knowledge and understanding. This puts students who struggle with language at a severe disadvantage when it comes to playing the game of school. Those who have strong linguistic abilities tend to do well overall, and those who don't tend to struggle inordinately in most academic subjects. Consequently, success or failure in education is largely dependent on language, as it is both the object of knowledge and one of the principal means through which new knowledge is acquired (Cazden, 1973).

As a speech-language pathologist, what has amazed me most about Thinking Maps is that they offer a milieu from which focused language can emerge. They scaffold and integrate multiple systems that support expression. Maps allow for interactions between listening, speaking, reading, and writing within a language of thinking that bridges visual-spatial and verbal representations. Consequently, they profoundly change both the language used *within* the classroom and the language demands *of* the classroom. This change allows students who struggle with listening, speaking, reading, or writing, or who previously could only stand on the sidelines, to get in the game.

Thinking Maps change the way teachers talk to students, which changes the way students talk to themselves and each other. We hear students and teachers use words such as *think, classify, sequence, analogy,* and *brainstorm.* These words represent cognitive processes—internal workings of the mind. In classrooms using Thinking Maps, such cognitive processes are taught to students directly, and the words that represent them are woven through an ongoing conversation about how to do the thinking that school requires. It is truly astounding to hear a first-grade teacher ask her class, "How are you thinking about this?" and have *all* of her students raise their hands confidently with an answer. No longer are students guessing blindly at how to approach a task, hoping they will stumble across a path that will lead to success. Now, they are asked to consider what cognitive route(s) they will take before they set out on their journey. That consideration takes place through language—through an explicit and constructive dialogue between teachers and students about what kind of thinking a task requires and which thinking tools will get the job done. This explicit conversation about thinking fosters the development of metacognition—the seed from which self-regulated learners grow.

Organized Thinking and Coherent Speaking

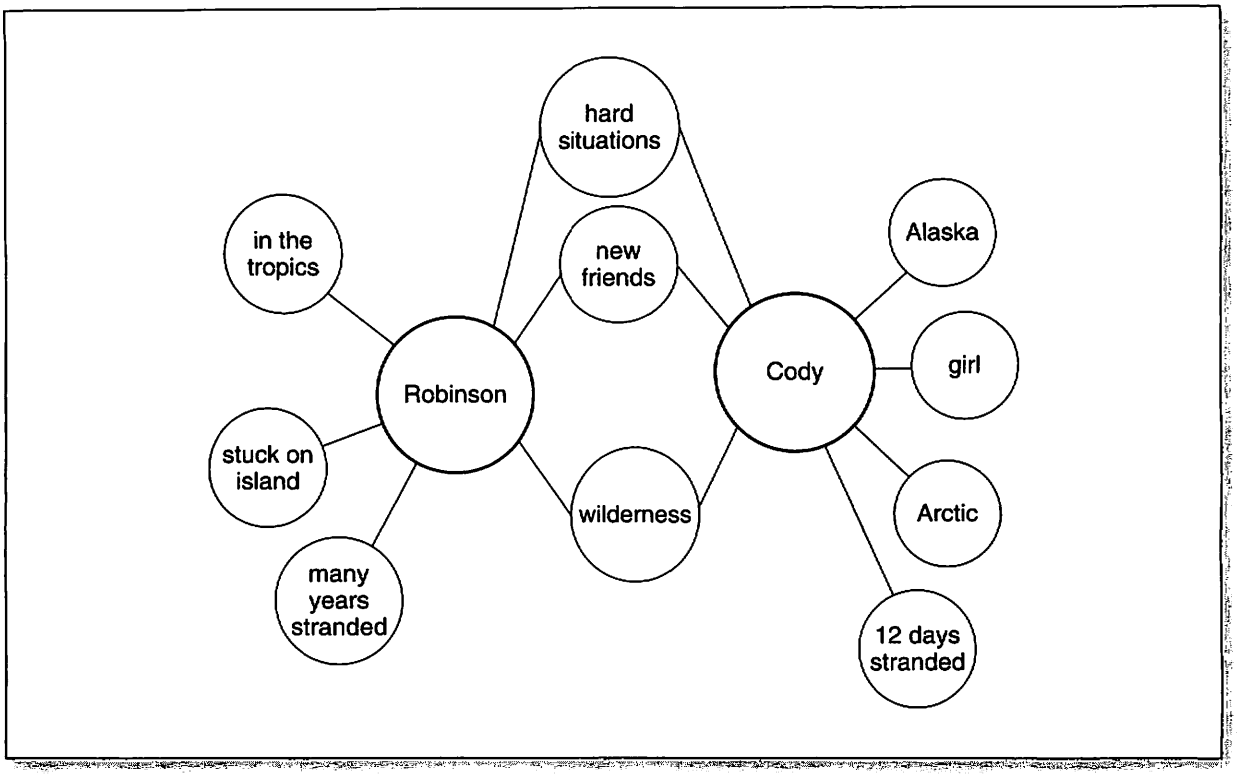
Thinking Maps explicitly promote student reflection, which is necessary for planning and organizing. In using the maps, students can develop the executive functions necessary to support language and scaffold social participation in a learning community. The maps store words and ideas until students decide what to do with them. Because they represent *specific* thought processes, and do so visually, they help students inhibit mental actions that are irrelevant to the task and decide what to attend to and what to do. They cue students to shift their approach when what they are mapping doesn't capture their thinking accurately, and they guide students to monitor and evaluate their behavior and make adjustments as necessary. As one student at the Learning Prep School in Massachusetts (a school for students with severe learning disabilities) once said to me, "The maps are like a brain."

I routinely ask students how the maps help them, and the number-one response I get is "They help me organize my ideas." Often, students and teachers mention the payoff this has with writing. What strikes me more is the payoff it has with talking. Thinking Maps change the way students talk to their teachers, their parents, and each other. Having a place to arrange and store their words helps them. What also helps them are the visual-spatial arrays that represent structured thought and discourse. The maps are devices that allow students to *see* what they think and find the language that will convey that knowledge to their teachers and each other in a clear and organized way. As one fifth-grade student told me, "The maps put my thoughts into action."

Nick, a sixth-grade student with a learning disability attending the Learning Prep School, shared a Double Bubble Map he made to compare and contrast the main characters in two books he read during independent reading (see Figure 3.2). He not only read the words and phrases on his map to his classmates; he also elaborated upon each idea by offering details and examples from the two books he read. For example, when discussing the similarities of the characters regarding the making of new friends, Nick explained that Robinson met a native person on his island, while Cody met a person in the woods. Both found new friends to help them survive while they were stranded in isolating environments—Robinson on an island and Cody in the arctic forest of Alaska. Nick recalled key facts about each character, and what is more impressive is that making the map helped him to remember, integrate, and understand the books at a very deep level. Talking *from* the map allowed him to share what he knew in nicely organized and coherent discourse. Nick noted that he never would have remembered all those details if he hadn't constructed that kind of map. He went on to explain that the Double Bubble and Tree Maps help him more than the other Thinking Maps because they depict ways of thinking he previously found difficult.

Having trained and mentored faculties of two schools that exclusively serve students with a broad range of learning disabilities (the Norman Howard School in Rochester, New York, and the Learning Prep School in Newton, Massachusetts), I have been struck time and time again by how oral communication in the classroom changes. Via the maps, communication literally takes on a whole new shape. Teachers and students have a means for integrating key concepts and conveying new understandings fluidly, grounding them in a spatial realm. It is fascinating to me to watch teachers and students talk about how they will use one map or another. They gesture as they talk; they make circles and boxes and lines in the air, and they plug their ideas into these imaginary spaces. Their spoken language piggybacks onto a spatial superstructure. Fluid classroom discourse, then, is born from the marriage of verbal and spatial realms—from the integrated workings of both the right and left hemispheres. I believe this has much to do with why the maps bring about such profound changes in classroom environments and student performance. They level the playing field for students who rely on relative strengths within either the verbal or the visual domain, bolstering whichever domain is weaker to bring about a more balanced learner.

Figure 3.2 Learning Prep Student Comparing and Contrasting Two Characters



Not only does the nature of spoken communication change in classrooms using Thinking Maps, but the amount of spoken language changes. Discussion and debate become more elaborate when students have tools that allow them to see how all of the pieces of curriculum content go together. As their ability to show what they know improves, so does their motivation for and investment in learning. Often, reluctant or reticent students begin to take more risks and participate. After only six months of using Thinking Maps with students, many faculty members at the Learning Prep School reported that the students' spoken and written output at least doubled. Indeed, one sixth-grade teacher in Chicago noted that she used to do all the talking when she taught. Since teaching the maps to her students, she now talks far less often. Her students do the talking, and she helps them see where their learning conversation is going.

Closing the Gap for Underachievers

Though Thinking Maps have the potential to raise the performance of all learners, they are particularly powerful for students who are functioning in the bottom of the bell curve (i.e., students with identified special needs and those who are not coded but are struggling nonetheless, perhaps due to mild problems with executive functions). Who are these students, and what are the implications of using Thinking Maps with them?

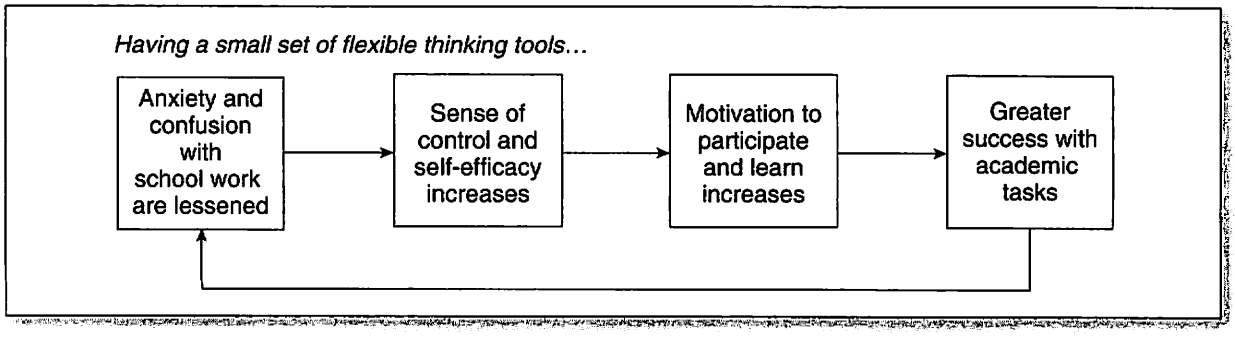
In the lower quartile, we find three groups of students. One group has identified disabilities, but these students can function quite well when classroom instruction supports and accommodates their unique learning styles and needs. For them, the maps are strategies that bridge cognitive, visual, and verbal realms, perhaps providing a tool set that allows these

students to manage mainstream curriculum demands. Another group has significant learning challenges that require special education services (e.g., students with language disorders, learning disabilities, perceptual disorders, motor disorders, or compromised cognition). The maps provide teachers of general and special education serving these students with a common language and tool set for teaching, thereby fostering collaboration and partnership among school faculty. Whereas these students generally lack flexibility in their learning styles and have difficulty transferring new learning from one context to another, the maps provide them with a set of tools they can use both in and out of the classroom. They form a bridge between general and special education.

A third group in the bottom quartile consists of students who are poor CEOs of their own learning. Lacking insight about how to meet academic task demands, they are underachieving relative to their potential. As a result, they aren't sure how to get from A to Z when given a task unless they are provided with explicit scaffolds. In some cases, such students fail to make progress in the general education curriculum and are referred for special education services. Too often, they don't qualify for extra support, and the gap between academic expectations and their achievement continues to widen. For all groups in the lower quartile, Thinking Maps can help students regulate their own learning and be more successful in the game of school because the maps serve as a device for mediating thinking, listening, talking, reading, writing, problem solving, and the acquisition of new knowledge and understanding. They can be used for universal instructional design and the successful inclusion of all learners.

The Thinking Maps, then, have the potential for reducing the number of students in special education and allowing more students not only to survive but to thrive in general education classrooms. Consequently, they have the potential to be a school's most powerful weapon when it comes to closing the achievement gap. As the Flow Map in Figure 3.3 shows, having a small set of flexible thinking tools lessens all students' anxiety and confusion about school work, which brings forth an increased sense of control and self-efficacy, which leads in turn to increased motivation to participate and learn as well as to greater academic success. Success further decreases anxiety and confusion, and the cycle continues. By leveling the playing field, Thinking Maps provide students who are not doing well with the tools they need to win at school.

Figure 3.3 Effects of Thinking Maps on Student Learning



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