

# Getting to "Got It!"

Helping Struggling Students  
Learn How to Learn

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Betty K. Garner



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Acknowledgments .....	vii
Introduction.....	ix
1. Cognitive Structures: What They Are and Why They Matter .....	1
2. Recognition .....	30
3. Memorization.....	35
4. Conservation of Constancy.....	46
5. Classification.....	60
6. Spatial Orientation .....	79
7. Temporal Orientation.....	102
8. Metaphorical Thinking .....	119
9. The Spiritual Dimensions of Learning .....	132
Appendix A: Lesson Plan Model for Cognitive Engagement.....	148
Appendix B: An Invitation to Become a Reflective Researcher .....	152
Glossary .....	158
Resources .....	160
Index.....	163
About the Author.....	167



## Cognitive Structures: What They Are and Why They Matter

Imagine what it would be like to sit in a classroom and have nothing make sense. There are far too many students in our schools today who don't have to imagine this, even though today's schools are filled with dedicated teachers working hard and using research-based instructional practices in an effort to help their students learn. When we present a very well planned, logical lesson, we wonder why some students "get it" and others do not. After reexamining our methods and our curriculum, and after trying and failing again and again to reach a subset of students, we ask ourselves some hard questions: Are the students who don't get it learning disabled? Are they unmotivated? Are they unfocused, inattentive, lazy? Are they just "slow"?

To try to reach these students, our schools offer after-school study programs, remedial reading and math programs, summer school, tutoring, resource services, and special education. Still there are students who do not understand and do not achieve. Concerned parents take these students to tutors and specialists or enroll them in expensive learning centers. Still these students struggle.

Meanwhile, sitting in the same classroom with the struggling students are the high-achieving students. They thrive on our

well-prepared lessons, and secretly we suspect that they could learn from anyone at any time with any kind of method. They can do this because they know how to gather, process, and output information. They have well-developed cognitive structures.

## Cognitive Structures Defined

*Cognitive structures* are the basic mental processes people use to make sense of information. Other names for cognitive structures include *mental structures*, *mental tools*, and *patterns of thought*. To clarify how cognitive structures function, I group them into three interdependent categories:

1. *Comparative thinking structures* process information by identifying how bits of data are alike and different. They include *recognition*, *memorization*, *conservation of constancies*, *classification*, *spatial orientation*, *temporal orientation*, and *metaphorical thinking*. Comparative thinking structures are foundational to learning. As the prerequisites to the more complex cognitive structures in the other two categories, they are the focus of this book.

2. *Symbolic representation structures* transform information into culturally acceptable coding systems. They include *verbal and nonverbal language*; *mathematics*; *music and rhythms*; *movements, dance, and gestures*; *interpersonal interactions*; *graphics (two-dimensional drawings, paintings, logos)*; *sculpture and constructions*; and *simulation, drama, and multimedia*.

3. *Logical reasoning structures* use abstract thinking strategies to systematically process and generate information. They include *deductive and inductive reasoning*, *analogical and hypothetical thinking*, *cause–effect relationships*, *analysis*, *synthesis*, *evaluation*, *problem framing*, and *problem solving*.

One reason that educators don’t immediately identify underdeveloped or underused cognitive structures as a source of

learning difficulties is that we assume they operate automatically. Our own ability to process information quickly and work easily with abstract ideas can make it difficult for us to imagine what it is like to struggle to do these things, or to grasp that it is even possible for someone over the age of 7 or 8 to *not* be able to gather and organize information, recognize patterns, or see “obvious” connections.

Often, neither the struggling students nor their teachers are aware of what lies behind the students’ failure. The teachers get frustrated and conclude that the students need to pay more attention, work harder, or change their attitudes. The students have no idea why they don’t get it; they think that the schoolwork is simply too hard or doesn’t make sense. They may quit trying and become behavior problems, or they may slip through the cracks in the system, passing from grade to grade with minimal competency. Those who do get by typically do so by using memorization or imitation strategies. Although these tricks can help students find right answers, using them gets students no closer to experiencing the joy and excitement of deep understanding. They get no closer to developing metability.

## Two Key Points

The more educators learn about how cognitive structures affect learning, the more cause there is for us to be optimistic. There are two key points to keep in mind:

1. *Each individual has to develop his or her own cognitive structures.* However, just as good coaching helps athletes improve their performance, good teaching provides learning opportunities that stimulate students’ reflective awareness and visualization and help them develop their cognitive structures.

2. *It is never too late to develop cognitive structures.* From infancy through old age, everyone who has the neurological capacity to communicate, to be reflectively aware, and to use

visualization can develop cognitive structures. When I work with students who are struggling in school, I explain that they already have the capability to learn; what they need to do is learn how to use their “mental tools.”

***Andre: An Unmotivated 7th Grader***

Andre was one of those seemingly unmotivated students who barely did enough to get by and really disliked school. I used an analogy to help him understand cognitive structures.

“Andre, do you know anyone who is really good at working on cars?” I asked.

“Yeah, my Uncle George.”

“Has he got some tools he uses?”

“Oh, yeah! His garage is full of wrenches and stuff.”

“He’s good, right? He knows how to use his tools and make them work for him?”

“You bet!”

“If you had his tools but didn’t know how to use them, would they do you any good?”

“Not really.”

“What if you found out that you have mental tools in your head?”

Andre looked at me suspiciously. “What do you mean?”

“Your mind has tools, called cognitive structures, that will make learning a whole lot easier,” I explained. “They’ll do the work for you. Would you like that?”

“Wow!” Andre responded. “I didn’t know I had tools in my head. How do I use them?”

In class, Andre normally sat back and waited for the teacher to tell him what to do. He just followed directions. When I worked with Andre, he began to use his cognitive structures to create meaning, change his understanding, and learn. He actually became excited about his “mental tools” and enjoyed the challenge of figuring things out on his own.