

Introduction

20 Instructional Strategies That Engage the Brain

SCENARIO I ■

Let me tell you a true story. Visualize the following classrooms, if you will.

Mrs. Taylor teaches civics at Mainstreet Middle School. Lecture is her primary method of delivering instruction. Sometimes, the lectures last more than half the period. Today, the objective is to teach the branches of the federal government, and as usual, she is delivering a 30-minute talk on the three branches. She has no accompanying visuals and is depending on students to retain her content simply from listening to her talk and taking notes. Some of the higher-achieving students are paying close attention because they know that much of the information will appear on the midterm exam. Other students are maintaining eye contact with Mrs. Taylor while thinking about everything except the branches of the government. Several students are engaged in conversation and are promptly reprimanded. Mrs. Taylor doesn't even realize that most of the class stopped listening to her lectures during the first few days and weeks of school.

During the second half of the period, Mrs. Taylor changes her strategy so she can more actively engage students. She decides to have students round-robin orally read the chapter in the textbook. She assigns sections of the chapter in the order in which students are seated with the expectation that they will take turns reading their assigned sections aloud. What she hasn't noticed is that when the first student is reading aloud, all other students who have assignments are counting down to their section and prereading so they will not sound *stupid* when it is time for them to read aloud. Because the brain can only pay conscious attention to one thing at a time, this means that these students are not paying a bit of attention to the person who is reading. However, neither is the remainder of the class. Because some students are better oral readers than others, many students are finding this activity boring and much of the attention of the class is diverted. Some are talking, others are doodling, and others have their heads on their desks while still others are staring into space. After about a 20-minute period, students are told to use the remainder of the class time to answer the questions at the end of the chapter in writing and to complete for homework any questions not finished during the period. The bell rings and students run over one another as they race for the door.



SCENARIO II ■

Mr. Stewart teaches the same course at Midway Middle School. His students absolutely love him because they never quite know what to expect from day-to-day in his class. He has very few, if any, behavior problems. Mr. Stewart must cover the same curriculum as Mrs. Taylor; however, the two classrooms bear little resemblance to one another. Mr. Stewart is also teaching the branches of the federal government, but he is introducing the three branches while drawing a graphic organizer on the board as a visual. Students are asked to draw the visual in their notes so they will have a mind map to help them remember what is being taught. The graphic organizer consists of the three branches, a box underneath each that tells what each branch does, and a listing of which government positions are included in which branch. As Mr. Stewart completes the first branch, *judicial*, he stops and has students reteach what was just taught to their partners. Then he proceeds to the *executive* branch, continually asking, both students who volunteer and those who do not volunteer, questions to check for understanding.

As he finishes the third branch, *legislative*, Mr. Stewart engages students in a role play that is both memorable and lots of fun. He has made three signs, one for each branch of the government, and he places those signs in three different corners of the room. Then, Mr. Stewart moves around the room with his *magic wand* (a wand that lights up at the end and makes a noise), anointing students with the power of a government official. For example, one student is *anointed* as a Supreme Court Justice, another is anointed as the secretary of state, another is a senator, another serves in the house of representatives, and yet another is the vice president. Every student in class is assigned a role and asked to get up and go stand in the corner that represents the branch in which they belong. Once all students commit to a branch by moving to the appropriate corner, Mr. Stewart goes to each corner of the room and, one by one, asks students what positions they represent. The class determines whether the student is standing in the correct branch. With the exception of two, every student has selected the correct branch and the class celebrates their success with a loud, original cheer. Mr. Stewart summarizes the lesson by tossing a ball randomly to students and asking them questions about the lesson. The bell rings and Mr. Stewart stands at his door bidding a fond farewell to each student until tomorrow.

BRAIN-COMPATIBLE INSTRUCTION ■

Two middle school classes are both teaching the same content but using very different methodology. Which teacher would you rather have? Better yet, which teacher would you rather be? When you consider which teacher stands the best chance of getting the concept into the long-term memory of students' brains, no doubt, you would consider the latter class. Why?

One learns to do by doing.

—Aristotle



*Tell me, I forget.
Show me, I remember.
Involve me, I understand!*

—Old Chinese Proverb

Thousands of years of history support one major concept. When students are actively engaged in experiences with content, they stand a much better chance of learning and remembering what we want them to know. Yet with increased emphasis on *high-stakes testing*, teachers are apt to spend the majority of time using worksheets and lecture to teach lower-level concepts that can be best assessed by paper and pencil.

Learning-style theorists (Gardner, 1983; Marzano, 2007; McCarthy, 1990; and Sternberg & Grigorenko, 2000) and educational consultants (Jensen, 2008; Jensen, 2009b; Sousa, 2006; and Wolfe, 2001) have concluded that there are some instructional strategies that, by their very nature, result in long-term retention. Those strategies are addressed in numerous books about the brain but are not delineated in any one text. For the past 14 years, I have been studying the awesome functions of brain cells. Through my extensive reading, participation in workshops and courses with experts on the topic, and my observations of best practices in classrooms throughout the world, I have synthesized these instructional strategies into 20 methods for delivering instruction. And they work for the three following reasons:

1. They increase academic achievement for *all* of the following students: students who are in gifted classes, regular education classes, and special education classes; students who are in elementary, middle, and high school; students for whom English is a second language; and students who are learning across the curriculum.
2. They decrease behavior problems by minimizing the boredom factor in class and increasing the confidence factor in those students who would use their inadequacy as a cause for misbehavior.
3. They make teaching and learning fun for all grade levels so even students taking calculus are just as excited about learning as the kindergarten student is on the first day of school.

The 20 strategies are as follows:

1. Brainstorming and discussion
2. Drawing and artwork
3. Field trips
4. Games
5. Graphic organizers, semantic maps, and word webs
6. Humor
7. Manipulatives, experiments, labs, and models
8. Metaphors, analogies, and similes
9. Mnemonic devices
10. Movement

11. Music, rhythm, rhyme, and rap
12. Project-based and problem-based instruction
13. Reciprocal teaching and cooperative learning
14. Role plays, drama, pantomimes, and charades
15. Storytelling
16. Technology
17. Visualization and guided imagery
18. Visuals
19. Work-study and apprenticeships
20. Writing

President George Herbert Walker Bush declared the 1990s as the *decade of the brain*. Today, cofounder of Microsoft Paul Allen and others are investing millions into the continued study of the miracle of the brain. Teachers should be the first to avail themselves of this information because they are teaching the brains of students each and every day. In fact, I tell teachers that the next time they complete a résumé, they need to include that they are not only *teachers but also gardeners*, better known as *dendrite growers* because every time students learn something new in their classrooms, they grow a new brain cell, called a dendrite.

Refer to Figure 0.1 on page 8 for a correlation of these 20 strategies to Howard Gardner's Theory of Multiple Intelligences as well as to the four major modalities—(1) visual, (2) auditory, (3) kinesthetic, and (4) tactile. Each lesson that incorporates multiple modalities not only increases students' test scores but also stands a better chance of being remembered by students long after the teacher-made, criterion-referenced, or standardized tests are over. After all, isn't that what matters—long-term retention?

The book you are about to read attempts to accomplish four major objectives:

1. Review the research regarding the 20 brain-compatible strategies, as well as best practices in instruction regardless of the content area
2. Supply more than 200 examples of the application of the 20 strategies in teaching objectives at a variety of grade levels and in multiple content areas
3. Provide time and space at the end of each chapter for the reader to reflect on the application of the strategies as they apply directly to the reader's specific objectives
4. Demonstrate how to plan and deliver unforgettable lessons by asking the five questions on the lesson plan format contained in the Resource section of the book

The brain-compatible activities in each chapter are only samples of lessons that can be produced when the strategies are incorporated from kindergarten to calculus. They are intended only to get the reader's brain cells going, as they think up a multitude of additional ways to deliver brain-compatible instruction to their students.

When you really examine the list of 20, you will find that they are used most frequently in the lower elementary grades. When the strategies begin to disappear from the repertoire of teachers is about the same time that students' academic achievement, confidence, and love for school also diminish. The challenge is becoming so severe that when I pick up the *TIME* magazine dated April 17, 2006 (Thornburgh, 2006), the cover story is titled "Dropout Nation." It appears that the United States is not graduating approximately 30% of its high school students according to the article. In many major inner cities, the number can be as high as 50% to 60%. If a business were losing 30% to 60% of its clients per year, how long would it remain in business? The answer, of course, is *not very long*.

There are various reasons for the aforementioned dilemma, and no one person has all the answers. However, part of the answer lies in the following sign I saw posted on the wall in a teachers' lounge: *If students do not learn the way we teach them, then we must teach them the way they learn*. There are 20 ways to teach and 20 ways to learn.

This book is the foundational text in a series of multiple books about *growing dendrites*. The books are as follows:

- *Worksheets Don't Grow Dendrites: 20 Instructional Strategies That Engage the Brain*
- *Sit & Get Won't Grow Dendrites: 20 Professional Learning Strategies That Engage the Adult Brain*
- *Reading and Language Arts Worksheets Don't Grow Dendrites: 20 Literacy Strategies That Engage the Brain*
- *Shouting Won't Grow Dendrites: 20 Techniques for Managing a Brain-Compatible Classroom*
- *Mathematics Worksheets Don't Grow Dendrites: 20 Numeracy Strategies That Engage the Brain PreK–8*.

The activities outlined in each chapter of this text are designed to be starting points for planning lessons that are intended to be brain-compatible and are in no way meant to be an exhaustive list of possibilities. The advantage of having activities that range from kindergarten through Grade 12 in the same book is that the reader can easily select activities that will meet the needs of students performing below, on, and above grade level and can, therefore, more easily differentiate instruction. You will also find that an activity designated for a specific grade range can be taken as is or easily adapted to fit the grade level that the reader is teaching. Therefore, as you peruse this text, examine not only those activities in each content area that are age or grade appropriate but also look for ones at other grade levels that can easily meet your needs once you change the conceptual level of the material.

The reflection page at the end of each chapter enables readers to apply the activities read to their students or to enter activities that they have created. The lesson planning section helps the reader synthesize the process of planning unforgettable lessons by asking five pertinent questions.

Turn the page and begin your journey down a path that may help to revolutionize your instructional practices or support the effectiveness of some of the practices that you are currently using. At any rate, in many classrooms the fun has gone out of teaching and learning. Put it back while simultaneously growing their dendrites!

Comparison of Brain-Compatible Instructional Strategies to Learning Theory		
<i>Brain-Compatible Strategies</i>	<i>Multiple Intelligences</i>	<i>Visual, Auditory, Kinesthetic, Tactile (VAKT)</i>
Brainstorming and discussion	Verbal-linguistic	Auditory
Drawing and artwork	Spatial	Kinesthetic/tactile
Field trips	Naturalist	Kinesthetic/tactile
Games	Interpersonal	Kinesthetic/tactile
Graphic organizers, semantic maps, and word webs	Logical-mathematical/spatial	Visual/tactile
Humor	Verbal-linguistic	Auditory
Manipulatives, experiments, labs, and models	Logical-mathematical	Tactile
Metaphors, analogies, and similes	Spatial	Visual/auditory
Mnemonic devices	Musical-rhythmic	Visual/auditory
Movement	Bodily-kinesthetic	Kinesthetic
Music, rhythm, rhyme, and rap	Musical-rhythmic	Auditory
Project-based and problem-based learning	Logical-mathematical	Visual/tactile
Reciprocal teaching and cooperative learning	Verbal-linguistic	Auditory
Role plays, drama, pantomimes, charades	Bodily-kinesthetic	Kinesthetic
Storytelling	Verbal-linguistic	Auditory
Technology	Spatial	Visual/tactile
Visualization and guided imagery	Spatial	Visual
Visuals	Spatial	Visual
Work study and apprenticeships	Interpersonal	Kinesthetic
Writing and journals	Intrapersonal	Visual/tactile

Figure 0.1