

Becoming a “Wiz”  
at **BRAIN-BASED**  
**Teaching**

**How to Make Every Year Your Best Year**

Second Edition

Marilee Sprenger



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# Introduction

*“The road to the City of Emeralds is paved with yellow brick,” said the Good Witch, “so you cannot miss it.”*

I am speaking at a national conference. It is an educational gathering with various topics and presenters. It is lunchtime and I am in a long line of participants purchasing a quick sandwich before my next presentation.

The woman behind me taps me on the shoulder, “Do they have turkey up there? I’m not going to eat ham again. Yesterday, all they had left was ham.”

I look ahead and see a tray of turkey sandwiches. “I think you’re safe in this line today. There appears to be at least one full tray of turkey.”

“Hey, aren’t you that brain person?” she asks. “You talk about the brain and the classroom, don’t you? I thought I saw your name in the program book. My school studied the brain stuff last year. This year we’re bringing in people to talk about reading and other stuff like differentiation.”

“What do you think of the brain research applications?” I ask. “Did you find any success following the brain-based teaching principles?”

“Now, which ones were those? I tried to use some of the strategies on Fridays. That seems to be my best day to try something new,” she decides. “Guess this year, I’ll switch to something else. Maybe that differentiation stuff.”

My heart skips a beat when I hear this. I am about to try to explain how these philosophies connect when the teacher with this woman begins to speak. “Now, Doris,” she says, “You never really gave the brain research a chance. It is based on the same philosophies that differentiation is. In fact, I think differentiation is a spin-off of brain research.”

“I have to agree with you. Creating a brain-compatible classroom includes differentiating content, process, and product. When I began, it seemed an overwhelming task. But that was years ago, before many people had become translators and interpreters of the brain research. Why, it wasn’t very long ago that we didn’t even realize the brain had anything to do with learning!” I joke.

The two teachers laugh. We continue through the line and sit together to continue our conversation. Their principal and two other teachers join us.

“I’m sure you understand that with No Child Left Behind, we had to change our focus,” Mr. Phillips, the principal begins. “We had one of you brain people out last year, but the teachers didn’t really get into it as much as I thought they would.”

“How many professional development opportunities on brain-compatible teaching were offered?” I ask.

“Well, it was just the opening day staff development program. After that we had to use all of our staff development days on other things. We’re a small district and don’t have much money.”

“It’s a journey,” I say quietly. Then more loudly, “It’s a journey. One exposure is not going to make a difference. If you want to see change, staff development has to be ongoing. Baby steps at first. Trying something out and seeing if it works. Understanding why it works so you do it again. It’s an amazing voyage.

“I was struggling with my students and my sanity. Large classes with students from diverse backgrounds. Brain research saved my life. Or at least my career. I had to dig for information and basically train myself. Now there are all kinds of literature, conferences, and experts in the field who can help your teachers. Brain-compatible teaching is part of the big picture. It’s not the only thing, but it is certainly one of the roads to raising student achievement.

“Please don’t give your faculty a ‘spray and pray’ professional development experience. Choose a path and take them on a journey that will affect all of you, personally and professionally. Offer your students the opportunity to learn the way their brains learn best!” I realize that I have attracted some attention from nearby tables. This is not usually my style, and I compose myself. I still look directly at the administrator and smile.

“Well, you are passionate about this, aren’t you? If my teachers were that passionate about teaching, I would be pleased,” Mr. Phillips says.

“Perhaps you can lead them to a philosophy that will make them passionate about what they do. Support them and guide them with the practical classroom activities and strategies that will give you all a fresh outlook.

“My approach is simple. I compare it to the characters in *The Wizard of Oz*. It makes sense to me. The Cowardly Lion represents the stress that students have to deal with—the stress that teachers have to help control if learning is going to take place. The Tin Man represents the emotional systems in the brain. If we don’t deal with our students’ emotions, long-term memory can be a problem. And the Scarecrow wants a brain. He’s actually thinking about his thinking. That’s the metacognition we are after. Higher levels of thinking are possible if we

deal with the whole child. Understanding and applying how the brain functions, how memory works, and what the brain needs is what makes a classroom brain-based. Believing that every child is unique and learns differently—and then taking the suggestions of those who have applied these concepts in the classroom and trying them yourself—that’s what makes a difference.”

“Well, what’s Dorothy represent?”

“And the witch? Are the Munchkins representing those students who have different styles of learning?”

“Is the wizard representing the brain?”

There is a barrage of questions from the group I am talking to and a few others from surrounding tables. I sit back and prepare for a long discussion.

The formulation of this analogy took years of researching what the neuroscientists, neuropsychologists, and geneticists were discovering.

The brain-imaging techniques have offered us a multitude of information that was impossible to ascertain when I began my own journey. We can see the living brain as it works and makes connections through **PET (positron emission tomography)** scans, **functional magnetic resonance imaging (fMRI)**, **SPECT scans**, and other technologies (see Table I.1). Functional magnetic resonance imaging has begun to be the most used imaging due to its low invasiveness, lack of radiation exposure, and relatively wide availability.

But it takes more than brain imaging to understand the brains of the many students who pass through our doors. I have learned much in my years of studying brain research, not only about the parts of the brain but also something more important. I have learned that some of the strategies I was using that worked weren’t necessarily good for kids. I was trying to tame those lions and tigers and bears with threats and wielded my power of homework or grades to prove who was in control. I was trying to force learning, when all I had to do was create an atmosphere that would allow it to happen. And there were times when I was teaching and no one was listening, because emotionally it just wasn’t possible for them to do so.

Although I am now much more confident as a teacher and an interpreter of brain research, there are days when I must face the fact that even though this information is second nature to me, and even though I see it as vital for the schools, the Wicked Witch is still fighting those lions and tigers. The knowledge of some of my successes—students returning to my room just to sit and feel safe, letters and calls about how much they remember from my classes and how it has helped them in high school and college, and standardized tests scores that go up—keep me on this path toward making others aware of the possibilities we have when we understand the brain.

**Table I.1** Common Types of Brain Imaging

<i>CAT: Computed Axial Tomography</i>	This type of scanning uses a series of X-rays of the head taken from many different directions. It is typically used for quickly viewing brain injuries, but the scan can also show areas of change.
<i>fMRI: Functional Magnetic Resonance Imaging</i>	This scan relies on the paramagnetic properties of oxygenated and deoxygenated hemoglobin to see images of changing blood flow in the brain associated with neural activity. This allows images to be generated that reflect which structures are activated (and how) during performance of different tasks.
<i>PET: Positron Emission Tomography</i>	After radioactive glucose is injected into the bloodstream, areas of the brain that are burning the most energy show up in reds and yellows in a scanning device. Blues and greens show less activity. In this way scientists can see what areas of the brain are required for certain functions as they ask participants to perform.
<i>SPECT: Single Photon Emission Computed Tomography</i>	SPECT is similar to PET. It uses gamma-ray emitting radioisotopes and a gamma camera that actually shows areas of metabolism. On a SPECT scan, one sees areas that look like holes in the brain, but they are actually areas not metabolizing properly.

I am still making my own journey. There have been many bumps in the road, and I have to remind myself about how to tame my own personal lions. While writing the first edition of this book, I faced my biggest challenge. I was diagnosed with breast cancer. It was devastating, and I had to cope with another journey. As it did to the Cowardly Lion, the stress response overwhelmed me. I was a member of a club that I hadn't wanted to join. Did I have the skills I needed to handle this situation? Amazingly, many of the concepts presented here were helpful to me. Controlling my stress led me to the Tin Man. I needed to use my emotional intelligence when dealing with my loved ones. I needed my children to understand and be calm. I needed the support of my family and friends. I needed a passion for life for myself. Just as the Scarecrow wanted a brain, my understanding of the brain and stress allowed me to make decisions about my attitude, my medications, and my health. I discovered that what I was doing in my classroom could have lifelong and life-altering effects. I hadn't wanted to give these strategies this particular test, but I was relieved

to discover that they passed. Like Dorothy, I had to follow a path I had not personally chosen. I had to conquer the Wicked Witch in me as I learned to control my state of mind. And as others gathered close to offer support, I knew there was no place like home.

I continue to use my knowledge about the brain as I face stressful situations. Having this information has affected my classroom, my personal life, and, I hope, the lives of many students who were in my care. I can happily say with this second edition that I am now a seven-year survivor. I look forward to continuing research to help us all lead longer, better lives and to assist others who have their own struggles. This book is for anyone who feels that his or her personal journey is ongoing and wants to use current research to broaden and enhance the trip down the Yellow Brick Road. Undergraduates, new teachers, and veterans will find information and strategies to boost their self-confidence and that of their students. Brain-based teaching is a philosophy that forms a framework for all learners.

There are several reasons for this second edition. The ongoing research has made compelling discoveries that support my continued goal of changing schools from institutions that encourage students to have classroom-compatible brains to institutions that encourage teachers to have brain-compatible classrooms. Specifically, you will find that I have made the following changes:

- Added information on the brain and poverty
- Began with the end in mind by discussing brain-compatible assessment in Chapter 2
- Increased information about how to utilize multiple intelligences
- Created a separate chapter devoted to memory and how to get information into long-term memory to make it accessible
- Introduced the revised Bloom's Taxonomy and how to take students from lower levels of thinking to higher levels
- Updated information on sleep and nutrition
- Added more stories and examples
- Expanded the glossary, and set each word listed in the glossary in boldface the first time it appears in the text
- Used Toto to point out pullout quotes

