

Introduction

Brain-Compatible Learning and Learner-Centered Education

Brain-compatible teaching occurs when educators seek out an understanding of current cognitive neuroscience research, translate specific findings into holistic practical strategies, and incorporate those strategies into their classroom practice. All decisions regarding instructional strategies, curriculum design, learning environments, and even behavior management can be influenced by what we know is *compatible* with how the brain learns optimally. While much of the neuroscience research may be in its infancy or specific to unique situations, the new knowledge can provide teachers with insight into the behaviors, learning abilities, skill acquisition, and emotional development of students. The research is confirming what great teachers have known intuitively:

- Students must feel safe and secure to maximize their ability to engage.
- Novelty and joyfulness contribute to engagement.
- Predictable patterns for behaviors and tasks can assist learners to know what to do next.
- Multisensory experiences in enriched environments can enhance brain growth and development.
- New concepts are acquired more quickly if they are hooked to prior learning and experiences.

- Processing new knowledge in a variety of ways can increase retention.
- Every learner is unique and has specific learning preferences and styles.

The human brain is dynamic and constantly reshaping itself based on its environment and experiences throughout life. This knowledge should influence parents and educators regarding everything they say or do—or don't do—as they contribute to the development of young brains. At the very least, some basic understanding of brain research can not only help teachers realize what teaching methods can *maximize* learning but also what methods might *minimize* learning.

Important information about how our brains grow, learn, forget, develop, diminish, and create is now being uncovered every day. Thanks to imaging tools such as fMRI (functional magnetic resonance imaging), new knowledge and understanding about the mysterious three-pound organ between our ears is being discovered and documented at an exponential rate—a speed that was inconceivable just a decade ago. Thousands of books, hundreds of Web sites, and dozens of education conferences are now dedicated to the seemingly inexhaustible subject: how the brain learns.

Many writers who follow the research in neuroscience, psychiatry, neurophysiology, nutrition, sociology, behavioral and cognitive psychology, and other fields have provided translational approaches to applying scientific findings in the classroom. Some researchers suggest that current neuroscience research findings are too preliminary and contradictory for educators to take the risk of interpreting and applying them to classroom practice. While I respect the rigor and cautionary stance of these experts, I cannot agree with their suggestion that teachers should ignore what we have recently learned about brain function. In many cases, brain-compatible teaching techniques are commonsense, natural learning strategies that excellent educators have used intuitively for years.

As research progresses and new complex studies emerge, the translation into the educational area must be dynamic also. Over the years, in order to point out the practical applicability of brain research, many trainers and authors, myself included, have sug-

gested simple techniques to begin creating a brain-friendly classroom. Some teachers implemented just a handful of ideas (such as altering the lights, providing water bottles, playing background music, or organizing brain-energizing movement activities) and then professed to be providing a comprehensive learning program based on the latest brain research! As time has passed and more information has become available, I believe that a more in-depth approach is now easier to support. Many teachers are now ready to explore more fully the question of how cognitive neuroscience can influence all aspects of curriculum and enrich instructional strategies. Through staff development, professional learning communities, and readings and investigations, educators are catching and riding a wave of new knowledge to apply in daily classroom implementation.

Learner-Centered Education

I believe that adjusting teaching strategies, designing safe and secure learning environments, and creating body-compatible classrooms should now be classified as *brain-compatible* techniques. Perhaps just as important, they should be seen as examples of *learner-centered* education.

This term emphasizes the importance of paying careful attention to the prior knowledge, existing skills, cultural differences, attitudes, and beliefs that learners bring to the educational environment. Learner-centered classrooms use instructional design and teaching practices based on what is currently known about learning and cognition. Such practices create environments where the individual student's needs, abilities, and interests are the primary focus.

The learner-centered approach encourages the student to be responsible for his or her own learning, emphasizes cooperation, addresses learning differences, and even considers each student's unique response to stress and pressure.

Teaching is always a matter of doing what you can with what you know at the time. I remember a year early in my career when I had 38 students in a single fourth- and fifth-grade class. These kids were creative, energetic, silly, devious, wired, curious, and fun. In 180 days I was supposed to teach them *all* their required

subjects! I had to use every strategy I could think of just to keep us on track. I approached this task as I had approached similar situations in my teaching career: by giving points and time-outs, by taking away privileges, personal property, and rights. I controlled and dictated, mandated and glared. I used stopwatches, stickers, tickets, and “bucks.” Most of the strategies were for a good reason at the time, and many of them seemed to work for a while. Many were just desperate attempts to control the chaos.

When I finally began investigating the research about the brain and learning, I found out that I was able to understand many of the possible reasons for my students’ actions and behaviors. Once I understood the theory, I could create systems that were more likely to prevent the situations that kept students from being as successful as they could be.

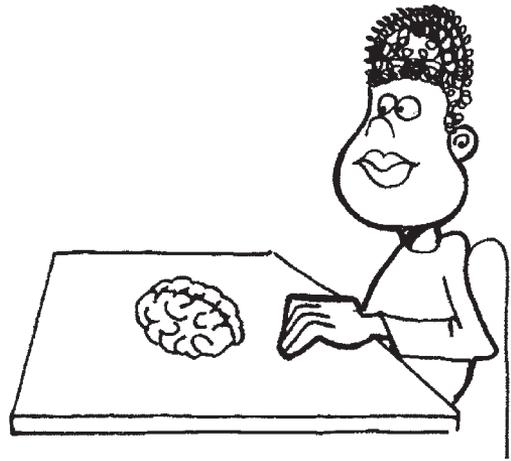
I believe the most successful teachers have always used learner-centered, brain-compatible strategies intuitively. What makes the present period so exciting is that we now have a better understanding of why those great teachers’ get such good results!

As I conduct teacher workshops, I always ask participants to review all of the ideas that I suggest and identify the ones they are already using in their classroom practice. Invariably, people spot brain-compatible, learner-centered strategies they’ve been incorporating successfully in the classroom.

“That’s great!” I say whenever we identify one of these strategies. “Give yourself a pat on the back!” I also ask teachers to reflect on their typical teaching day and consider routines and situations that may now be a struggle for their students.

A thoughtful, responsive teacher is always on the lookout for innovative ways to improve and on the lookout for new ideas. Today’s brain research allows us to confirm and elaborate on some truly great ideas for teachers. Thanks to the remarkable research that’s taken place in recent years, we are now in a position to orchestrate much more effective strategies for our students. Isn’t that our job? I believe it is, and I believe a brain-compatible, learner-centered classroom can become a reality for our students once we begin to understand just a little bit of what is now known about how the brain functions, learns, and reacts.

1



Begin With the Brain

Interpreting Neuroscience Research

It is often popularly argued that advances in the understanding of brain development and mechanisms of learning have substantial implications for education and the learning sciences. . . . Neuroscience has advanced to the point where it is time to think critically about the form in which research information is made available to educators so that it is interpreted appropriately for practice.

—Bransford, et al., *How People Learn*

In the early 1980s I heard Dr. Marian Diamond, a neuroscientist from the University of California at Berkeley, give a keynote address at the annual conference for the California Association for the Gifted. After she had amazed the audience of primarily educators with her findings about “enriched environments,”