

6 Powerful Research Connections Critical for Educators to Make about Brain-Based Education

Here are some of the powerful connections for educators to make in our new understanding of the new brain-based paradigm.

1. NEUROGENESIS: Highly relevant is the recent discovery that the human brain can and does grow new neurons. Many survive and become functional. Now we know that new neurons are highly correlated with memory, mood, and learning. Of interest to educators is that this process can be regulated by our everyday behaviors, which include exercise, lower stress, and nutrition. Schools can and should influence these variables. This discovery came straight from neuroscientists Gerd Kempermann and Fred Gage. **Practical school application:** Support more, not less physical activity, recess, and classroom movement.

2. MIRROR NEURONS: Social conditions influence our brain in ways we never knew before. The discovery of mirror neurons by Iacomo Rizzolati (and colleagues) at the University of Parma in Italy suggests a vehicle for an imitative reciprocity in our brain. School behaviors are highly social experiences, which become encoded through our sense of reward, acceptance, pain, pleasure, coherence, affinity, and stress. This emerging discipline is explored in *Social Neuroscience* - a new academic journal exploring how social conditions affect the brain. This understanding suggests we be more proactive in managing the social environment of students, since they are more affected by it than we earlier thought. It may unlock clues to those with autism, since their mirror neurons are less active. **Practical school application:** Do NOT allow random social groupings. Use mentoring, teams, and buddy systems. Work to strengthen pro-social conditions.

3. NEUROPLASTICITY: The ability of the brain to rewire and remap itself via neuroplasticity is profound. The new *Journal of Neuroplasticity* explores these and related issues. We now know the brain can rewire itself to repair damage to the vestibular system, from strokes, loss of hearing, loss of eyesight, from learning delays, and more. Schools can influence this process through skill building, reading, meditation, arts, career and technical education, and thinking skills that build student success. The evidence is compelling that when the correct skill-building protocol, verified by the work of neuroscientists Michael Merzenich and Paula Tallal, is used, educators can make positive and significant changes in our brain in a short time. Without understanding the “rules for how our brain changes,” educators can waste time, and money and, as a result, students will fall through the cracks. You can upgrade a student’s capacity for memory, processing, sequencing, attention, and impulsivity regulation. Why not teach these skills to give students the tools to succeed? **Practical school application:** Give teachers a mandate of 30-90 minutes a day and 3-5x per week to upgrade student skill sets. Less than that and you delay progress (*Stress* and *The Journal of Traumatic Stress*). **Practical school application:** Increase student perception of choice, build coping skills, quit ignoring this issue, and strengthen arts, physical activity, and mentoring.

4. EPIGENETICS [OUTSIDE OF GENES]: Old school was “environment versus genes” in deciding the outcome of a student. We now know that there’s a third option for change: gene expression. This is the capacity of our genes to respond to chronic or acute environmental input. This new understanding highlights a new vehicle for change in our

students. Neuroscientist Bruce Lipton and Ernest Rossi have written for laypersons how our everyday behaviors can influence gene expression (Lipton, 2005 and Rossi, 2002). New journals called *Gene Expression*, *Gene Expression Patterns*, and *Nature Genetics* explore the mechanisms for epigenetic (outside of genes) changes. Evidence suggests that gene expression can be regulated by what we do in schools and that these can enhance or harm long-term change prospects. **Practical school application:** Raise expectations for every student, but give them the skill sets, relationships, and hope to succeed.

5. EXERCISE & INCREASED BRAIN MASS: The current high stakes testing environment means some educators are eliminating recess, play or physical education from the daily agendas. The value of exercise to the brain was highlighted in a recent cover story in Newsweek. More importantly, there are continual studies in *The Journal of Exercise or Pediatric Exercise Science* or *Journal of Exercise Physiology Online*. The discovery is that exercise is strongly correlated with increased brain mass, better cognition, mood regulation and new cell production. When the studies are well designed, there is support for physical activity in schools (Pellegrini and Bohn 2005) and (Sibley and Etnier, 2002). P.E. actually raises test scores in the district, not lowers them. Read John Ratey's new book *SPARK*. Physical activity triggers the release of glycogen, which gets glucose into the bloodstream and the brain. **Practical school application:** Make it mandatory for at least 30 minutes a day for 5 days a week.

6. THE DISCOVERY THAT ENVIRONMENTS ALTER OUR BRAINS IS PROFOUND. The physical environment we are in can raise or lower critical brain chemicals such as cortisol, acetylcholine, and serotonin. This can influence behavior. This research goes back decades to the early work of the first trailblazing biological psychologists Mark Rosenzweig at UC Berkeley and Bill Greenough at the University of Illinois, Champagne-Urbana. In fact, a new collaboration has emerged between neuroscientists and those who design environments (architects). Their website reads... "The mission of the Academy of Neuroscience for Architecture is to promote and advance knowledge that links neuroscience research to a growing understanding of human responses to the built environment." This is highly relevant for administrators and policymakers who are responsible for school building designs. **Practical school application:** Upgrade the school environment with enrichment such as music, arts, movement, and social spaces.

BRAIN-BASED TEACHING IS WELL RESEARCH BASED

WHY PAY ATTENTION?

A field has emerged known as "brain-based" education and it has now been well over twenty years since this "connect the dots" approach has begun. In a nutshell, brain-based education says, "Everything we do uses our brain; let's learn more about it and apply that knowledge."

The issues that educators should care about are multidisciplinary. Evidence will show that "brain-based" does not stand alone as a fantasy or narrow-field paradigm; it's a significant educational paradigm of the 21st century. Brain-based education is the "engagement of strategies based on principles derived from an understanding of the brain." Notice it *does not* say, "Based on strategies *given to us* from *neuroscientists*." That's not appropriate. Notice it does not say, "Based on strategies *exclusively from neuroscience and no other discipline*."

The question is, "Are the approaches and strategies based on solid research from brain-related disciplines or are they based on myths, a well-meaning mentor teacher or from "junk science?" We would expect an educator to be able to support the use of a particular classroom strategy with scientific reasoning or studies.

Each educator needs to be professional enough to say, "Here's *why* I do what I do." Brain-based education is about the professionalism of knowing *why one strategy is used over another*. The science is based on what we know about how our brain works. It's the professionalism to be research-based in one's practices. Keep in mind that if you don't know *why* you do what you do, it's less purposeful and less professional. It's probably your collected, refined wisdom.

Nothing wrong with that, but some of the "collected, refined wisdom" has led to some bad teaching, too. While Eric Jensen has, for years, advocated "brain-based" education, he states the he has never promoted it as the "exclusive" or *only* discipline for schools to consider. That's narrow-minded. But, on the other hand, the brain is involved in everything we do at school. To ignore it, is irresponsible. Now, an appropriate question is, "Where exactly is this research coming from?" The great part about brain-based education is that Jensen and the research speak of studies and exploration in this field as "interdisciplinary."

Adapted from "[10 Critical Things You Should Know About Brain Based Education](#)" ©Eric Jensen through Dr. Jean Seville Suffield, Senior Faculty, WGI, and Trainer in Brain-Based Education, jeanseville@hotmail.com and Lynn Sumida, Senior Faculty, WGI, lynsumida@miruspoint.com