

# Beyond Learning Styles: Brain-Based Research and English Language Learners

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**Abstract:** In this article, the author discusses ways in which teachers can implement brain-based research in teaching English language learners (ELLs). Teachers of ELLs can draw on recently developed brain-based research applied to other learners, in addition to their considerations of multicultural strategies, learning styles, and diverse needs. Equipped with an array of diverse teaching approaches, ELL teachers can tap into the best of brain-compatible learning and neurodevelopmental applications, providing innovative ways to reach students.

**Keywords:** brain-based research, brain-compatible learning, English language learners, neurodevelopmental, teaching

Angela Medina enters her seventh-grade classroom knowing her students have a range of learning abilities; a quarter are designated English Language Learners (ELLs). In the traditional approach to teaching, she would ask her students to read a chapter, hear a lecture, take a quiz, and then start the cycle over. Fortunately, ELL teachers and learners live in an exciting time when brain-based research done primarily with native speakers offers new ways to inspire ELLs. Teaching around the wheel—using the full range of auditory, visual, and kinesthetic strategies—activity shifting, instructional intelligence, multiple intelligences, and an array of diverse teaching approaches all tap in to the best of brain-compatible learning and provide innovative ways to reach students. Teachers of ELLs can now draw on recently developed brain-based research applied to other learners, in addition to their considerations of multicultural strategies, learning styles, and diverse needs.

## The Cutting Edge in Brain-Based Research

Experts recognize that we have learned more about the brain in the last decade than in all the time preceding. Even into the 1960s, researchers saw the brain and intelligence as fixed. In contrast, President George H. W. Bush and the U.S. Congress recognized the 1990s as “The Decade of the Brain,” a joint initiative sponsored by the Library of Congress and the National Institute of Mental Health recognizing the benefits of neuroscience to almost every aspect of life.

For example, in the *dendritic fireworks* theory, brain researchers Diamond (1996) and Scheibel (1996) indicate that we can literally grow our brains, that is, every time we learn something new, the brain grows new dendrites and neural connections. Park explains how a 1998 discovery further supported this theory of the ever-growing brain:

Until Fred Gage came along, brain scientists accepted as a matter of faith that the neurons, or brain cells, you were born with were all the brain cells you would ever have. Then. . . this . . . neurobiologist at the Salk Institute for Biological Studies . . . showed in a groundbreaking experiment that *neurons are constantly being born, particularly in the learning and memory centers* [emphasis added]. Gage’s discovery forced scientists to rethink some of their most basic ideas about how the brain works. Even more exciting was the fact that the source of these new cells was *neural-stem cells, master cells with the ability to morph into any type of brain cell*, [emphasis added] depending on the chemical signals they receive as they grow. (Park 2000, 1)

What learning techniques compatible with this new, more dynamic understanding of the brain do we find in popular language-acquisition approaches? Krashen’s Language Model (Doherty and Jensen 1998; Zadina 2005), first posited in 1979, calls for rich and varied input,

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suggests language is acquired naturally and peripherally, emphasizes message over form, recognizes the importance of the unconscious, and says attitude is more important than aptitude. Terrell's Natural Approach (Krashen and Terrell 1983) indicates that learning is social, speech progresses through natural stages, and the instructor must create a nonthreatening, stimulating environment for best results. Asher's Total Physical Response, developed in 1969, says that second-language acquisition mirrors first-language acquisition in its commands and physical responses, that a significant pathway for learning is through procedural memory, and that motion activates emotion which activates memory. Lozanov's Suggestopedia approach (1978), presented to the United Nations Educational, Scientific and Cultural Organization in 1978, states that the brain learns consciously and paraconsciously, through nonverbal communication, voice, and physical environment, and that learning engages the entire physiology.

Levine is a leading innovator in neurodevelopmental approaches to learning and cofounder of All Kinds of Minds, an institute for the study of differences in learning. In Levine's pivotal work, *A Mind at a Time* (2003), he recommends transforming a verbal task into a visual task and a visual task into a kinesthetic one. Levine posits these key ideas:

1. Observed behaviors are windows to learning.
2. Every student comes to school with a balance sheet of strengths and weaknesses.
3. Labels create barriers and do not tell us what is going on when students try to tackle assignments.
4. Students should be helped to see their special possibilities for a gratifying life.
5. No one can be good at everything.
6. Students need to be able to talk about their learning: if you think it is hard for the parents and teachers of children with behavior, attention, or linguistic challenges, try being the child.
7. Helping students get better at what they are good at and interested in makes sense.
8. Students have a right and need to be aware of their strengths and weaknesses in learning.
9. The brain can be modified at any age or stage.
10. Being a nonnative speaker is not a disability, yet many ELLs are misidentified as learning disabled.

Levine developed a framework, based on what he terms *neurodevelopmental functions*, for understanding why children struggle in school. In Levine's model of learning, these essential neurodevelopmental functions comprise eight constructs or systems, each with separate roles vital to effective learning: attention, memory, language, spatial ordering, sequential ordering, the motor system, higher thinking, and social thinking (Levine 2003; Spagna 2006).

Levine's work has primarily been applied to native speakers, but best practices with ELLs can effectively attend to the neurodevelopmental constructs. By creating an anticipatory set for learning through interactive activities, using graphic organizers, tapping prior knowledge, and encouraging student participation, brain-based approaches can motivate second-language learners. Throughout the lesson, students can paraphrase, summarize, and categorize information, create visual or graphic representations, and form associations. Lists, tables, charts, graphs, and mind maps (visual representation of linear notes) can help students organize information for more effective comprehension and retention.

Receptive and expressive language skills are developed through read-alouds, vocabulary explorations, reader's theater, pair-shares, and use of kinesthetic activities and audiovisuals to stimulate discussion. Rhythmic games, songs, and oral rehearsal may reinforce sequential ordering skills, whereas use of manipulatives and graphic organizers can help ELLs with spatial arrangement.

Students must feel they are in a welcoming, non-threatening environment when testing new language skills. ELL teachers can put second-language learners at ease by cooperative-learning activities like pair-share and jigsaw and by not interrupting fluency to correct students when they read aloud. Asking students to write autobiographies and share elements of their personal experiences helps them feel more socially grounded in the class. Practicing the social language used in restaurants, stores, and other social situations through skits and role-playing can help students rehearse and build their social language skills.

Other innovators include Howard Gardner, a professor in Harvard's Graduate School of Education, who in 1983 challenged theories of brain immutability with his pivotal work on multiple intelligences. In Gardner's key premise, he suggests it is not how smart we are but how we are smart and that multiple pathways to learning and understanding should be provided in education (1993). In neurologist Paul MacLean's triune brain theory, he states we have three brains, each representing a separate evolutionary stratum and function controlling our emotions, thoughts, and behaviors (1990). Robert Sternberg, former president of the American Psychological Association and currently at Yale, continues to test a Triarchic Theory of Intelligence in which intelligent behavior is modifiable and stems from a successful balance among analytical, creative, and practical abilities (Sternberg 1985).

We can share the exciting news about brain function and growth—that the brain is flexible, modifiable, and repairable—with ELLs through implementation of a range of strategies to stimulate interest, motivation, and brain growth. Our ELLs need to know there

is abundant hope for learning and improvement, that “the brain functions best with adequate time, the absence of threat, immediate feedback, dynamic interaction, with global contexts as well as delineation of parts, and in a state of relaxed alertness” (Gusman 2005, 1).

### Twelve Ways to Look at the Brain

Twelve principles of brain-based research apply to ELL learning and teaching (Caine and Caine 1994):

1. The brain is a complex adaptive system.

The brain can function on many levels and in many ways simultaneously. Activity shifting, or changing activities two to three times during a class period, and teaching around the wheel of learning styles stimulate thought and action in second-language-learner classrooms. The Center for Advanced Research in Language Acquisition provides exciting new ways to approach ELL learning styles, including informal assessments and inventories for students (Cohen 2003).

2. The brain is a social brain.

The brain likes and responds well to social engagement and oral sharing. Cooperative learning (e.g., jigsaw classroom), rituals, games, and talking for social interaction improve ELL learning (Zadina 2005).

3. The search for meaning is innate.

The brain wants to make sense of what it learns and to know that learning has purpose and value. When ELL teachers share with students a rationale for what they are doing, the brain and learner more deeply value the learning. Discovery, collaboration, community involvement, kinesthetic projects, and thematic teaching help to embed learning in real contexts, promoting understanding and enhancing memory (Zadina 2005).

4. The search for meaning occurs through patterning.

When the brain encounters a new idea, it searches for prior knowledge and similar experiences. Effective ELL teachers use front-loading—preteaching, modeling, and rehearsing key concepts, skills, and terms—by integrating graphic organizers, using prediction strategies, introducing vocabulary, conducting pair-shares, and presenting video clips to prepare the brain for the new knowledge to come. Discovery, inquiry, puzzles, thematic teaching, and interdisciplinary teaching all contribute to making meaning through patterning (Zadina 2005).

5. Emotions are critical to patterning.

Daniel Goleman (1997) describes the principle of emotional quotient in his pivotal work *Emotional Intelligence: Why It Can Matter More Than IQ*. The emotional intelligence principle posits that optimists with effective people skills are more successful than individuals with high IQs and poor interpersonal skills. In the ELL classroom, a warm, supportive, encouraging educational climate—that is, using a variety of teach-

ing strategies that are engaging and exciting to second-language learners—is conducive to successful learning outcomes.

6. Every brain simultaneously perceives and creates parts and wholes.

Successful ELL instructors engage learners in tasks that require both sides of the brain—analytical and creative—to engage, for example, using art to teach a math lesson or music to teach physics. Cross-disciplinary approaches recognize the importance of including both hemispheres, verbal and visual, in meaningful learning.

7. Learning involves both focused attention and peripheral perception.

The brain absorbs direct information but also pays attention to what Ruggiero (2000) calls *fringe thoughts*. Frequently, it is the offhanded remark, the subtext of a speech, and the nuances of a lesson that ELLs respond to, because the mind perceives subtleties. Teacher demeanor, processing time, reflection, contextual learning, real-life activities, and interdisciplinary courses can contribute to attention, perception, and learning through unconscious processes (Zadina 2005).

8. Learning always involves both conscious and unconscious processes.

In this iceberg principle of learning, based on the work of Anna and Sigmund Freud (1937), much of what one learns lies beneath the surface. To bring invisible, unconscious thought alive in the classroom, ELL instructors use reflection and metacognition, through questioning and application of learning. How does this knowledge apply? Relate? Work in reality?

9. We have at least two ways of organizing memory.

Two types of memory, short- and long-term, help ELL learners record completely all their experiences, as important and unimportant details get categorized and stored differently. ELL instructors can attend to both types of memory by organizing activities into meaningful parts, placing ideas in context, and infusing a range of learning styles and multiple intelligences into classroom practice.

10. Learning is developmental.

Learning something new actually helps the brain grow by building new neural pathways, dendrites, and connections. ELL instructors take advantage of this research by applying myriad new learning strategies to their second-language-learner classrooms, including all the modalities of learning and instructional technology.

11. Complex learning is enhanced by challenge and inhibited by threat.

At what level should we teach our ELL students? Teaching at a slightly elevated level that is challenging but not impossible in a warm and inviting atmosphere encourages our students to strive.

12. Every brain is uniquely organized.

Levine's *The Myth of Laziness* (2002) chronicles the problems that stem from unaddressed dysfunction in learners. Gardner's multiple intelligences theory (1993) emphasizes not how smart the learner is but how the learner is smart. Alternative, nontraditional approaches to learning address the diverse needs of ELLs and improve their confidence and skills.

### Conclusion

The brain is a marvelous organ that can be tapped into, taught, stimulated, and grown. Viewing ELLs through the lens of brain-based research gives new hope to educators and turns problems into possibilities. Using innovative, cutting-edge approaches helps teachers recognize that teaching and learning addresses the needs of diverse learners in second-language learning through a variety of strategies. The brain's complex, adaptive nature means ELLs are not stuck on a one-way street but can happily navigate a twelve-lane highway of choices and opportunities.

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