Welcome!

What is educational neuroscience?

Why is it significant?

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- Writer for Edutopia, an online publication from the George Lucas Foundation
- Teaches upper elementary students to test neuroscience strategies
- Coaches and conducts neuroscience workshops for educators
Brains, Behavior, and Engagement

How the Stress Response System Affects Teaching and Learning

Brain-Aligned Strategies for Student Success

Brains develop through connections and attachment – the carrier of brain development and the trigger of student behavior!
Humans Are a Living System

Each brain and heart uniquely learns, remembers, and embraces relationships and knowledge.

My Eureka Moment
Each brain and heart uniquely learns, remembers, and embraces relationships and knowledge.

Toddlers take in the world. They soak in experiences, relationships, voices, actions, and behaviors around them.

From two to six years old, soaking in continues, but there is imagination and creativity happening.

By age seven, the brain is like a big sponge, but also feeling the affects of trauma and adversity in earlier years.

Lack of attention, focus, and concentration is similar for children labeled ADHD as for children with post-traumatic stress disorder.

Starting in the pre-pubescent years, we begin to do some very heavy pruning of neural connections we are not using.
Watching the Pixar film, *Inside Out*, is an engaging way to help teachers and students better understand their neuroanatomy.

Whatever activities are part of students’ lives strengthen neural connections. What students stop doing gets pruned away.

Students are running on their emotions. Reminding them about their neural circuitry helps them regulate their behavior.

Brains are neural circuits. 10 through 16 years old is the second greatest time of brain development and brain change.

The activities educators share with students and the enthusiasm teachers provide them will help their brain architecture.

Neuroplasticity is the brain’s ability to form new connections, structurally and functionally, based on experience.
Behavioral Engagement

What's wrong with this student?

What happened to this student?

What is the student's story?

What is his private logic?
What is her developmental history? What is his private logic? What happened to this student? What is the student’s story?

The Prefrontal Cortex

The prefrontal cortex: where we do life, solve problems, regulate emotion, focus attention, and build working memory.

“Our greatest human superpower is our ability to inhibit”

-- Dr. Jill Bolte Taylor, Neuroanatomist

Amygdala

- Emotion, memory, and association system
- Produces unconscious memories
- Responses in the amygdala are felt, not thought
- Matures in infancy
The hippocampus regulates stress. Educators have a great opportunity to lower stress in the learning environment.

We can create opportunities for:
- New neural connections
- Exercising executive functions
- Improved emotional regulation
- Sustained attention

The Effects of Trauma and Adversity

Trauma and adversity alter brain chemistry and affect everything we do in our classrooms, schools, and districts.

Stress Affects Educators

Educators experience adversity, too, affecting their ability to remember and process information and may harm their students.

Stress and the HPA Axis

Chronic stress from classroom disruptions and job or financial worries can hijack and actually damage our brains.
Cortisol: The Stress Hormone

Extra amounts of cortisol damage the hippocampus so it cannot quiet the stress response.

Dendrites receive electrical information from axons. This triggers a chemical response that causes stress.

Stress Shrinks the Brain's Network

Chronic stress response causes our neural connections to fire up and wire together, causing hyperarousal and hypervigilance.

Stress Effects Learning

- Cortisol production prepares us to fight or flee
- When dopamine levels drop, we don't have goal-motivated behavior
- Stress impacts our ability to learn and to retain information

Boredom + Poor Nutrition = Cortisol

Lack of sleep, junk food, boredom at school, and worry trigger cortisol production and cause stress that interferes with learning.
Attachment

"Students who are loved at home, come to school to learn, and students who aren’t, come to school to be loved."

- Nicholas A. Ferroni

Attachment to and connection with adult caregivers, especially teachers, is the best way to build healthy brains in our students.

Emotional Triggers

- Emotions are contagious
- Step back, cool down
- Awareness of our triggers is a challenge
- Negative student behavior may be a trigger
First, teach students neuroanatomy. Then, regulate your brain and your students’ brains with breathing and movement.

What am I supposed to do?

Do You Hear Me?

Often when we discipline students their stress response has them offline. They don’t hear us, so we can’t calm them down.

“We are feeling creatures who think.”
— Dr. Jill Bolte Taylor

- Emotional regulation is key
- Help students know about neuroplasticity
- Greater understanding of neural circuits
- The brain can create new connections

Reshaping neural circuits lowers the stress response. Our ability to engage improves, even when there was trauma in early life.

Part 3
Brain-Aligned Strategies for Student Success

Resource Handout Packet

SPED Ahead
The Unloved Brain

If you lack a deep memory of feeling safe and loved, the receptors in the brain that respond to human kindness fail to develop.

When we are constantly feeling unloved and unsafe, our brain specializes in fear and abandonment.

Chandler lived in 14 different homes and experienced significant trauma that reorganized how his brain manages perceptions.

Many sights, sounds, touches, and actions cause flashbacks, emotional triggers that teachers may not be aware of.
Many students have experienced significant adversity, causing them to be defiant, oppositional, and sometimes violent.

Interviews with many groups of students reveal what they want educators to say and ask so they feel affirmed and connected.

I Believe In You

You’re going to be successful. There’s nothing holding you back. You make mistakes, but mistakes are learning tools.

Help Me Find My Purpose

Share stories of others who lost hope but tried again. Because of neuroplasticity, every moment is a new moment.

Ask Me...
Ask Me...

...how I am

...what I need

...how I'm feeling

Ask Me...

...how I am

...what I need

...how I'm feeling

Ask Me...

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Teach Neuroanatomy

Remember the 90-Second Rule!

The Lemon Test

Just imagining or remembering an experience causes our brains and bodies to react as if it is happening here and now.
Breathing and Movement

The two best ways to clear students’ negative emotion and to quiet the amygdala are breathing and movement.

Give Skills, Not Punishment

If we want students to pay attention and to self-regulate, we have to give them the skills they need.

Quieting the Stress Response

Brains are hard-wired with automatic habits of behavior. To quiet the stress response takes purposeful intention and neuroplasticity.

Connection + Purpose + Feeling Felt = Well-Being

Asking these four questions drives a formula for emotional, social and academic success for all of our students.

Focused Attention Practices

Students focus on a taste, a sound, or a visualization to quiet their stress response.
Pop Rocks Candy Exercise

This exercise is an example of a focused attention practice with specific stimuli for working memory and sustained attention.

Breathe!

Focusing students on how breathing can regulate our mood and lower stress is a simple yet powerful focused attention practice.

Attention for Learning

If the brain isn’t ready to ingest content, if it’s not engaged, if the stress response has not been quieted, then learning can’t happen.

Prime the Brain

Change your routine! Warm up your students’ brains for learning and engagement by adding novelty, anticipation, and curiosity.

Brain Intervals

Brain intervals are a very effective way to prime the brain and get it ready to learn.
The Power of Stories

Stories really matter. Teaching with imagery is important because the brain learns and thrives in context and patterns.

Ring Their Bells

One example of bell-ringers that will activate your students’ brains so they are engaged and ready to learn.

School is Stressful

For many students, just being at school is an adversity and a stressful experience.

Amygdala Reset Station

Create areas in classrooms where students go to calm down, regulate themselves and reset their brains for learning.

Help Students Relax

Adversity and trauma is unconscious and held in the body and brain. Give students a chance to relax and express themselves.

The Power of Questions

Questions de-escalate conflict, reduce stress from the limbic brain, and engage students when we show connection and relationship.
Behavioral Engagement

What do you need?

How can I help?

What can we do to make this better?


Q & A

#SPEDAhead
You mentioned that some educators you work with set up an amygdala reset station for teachers. What’s in these stations?

How does teaching students about how their own brains grow and develop affect their behavior?

Other than showing the film, Inside Out, what are the best ways to instruct children about their brains?

What are the best ways for us to reduce cortisol levels in students and SPED teachers?

How do we best communicate stress-reducing strategies to families, especially those who lack effective boundaries with their children?

What is the simplest brain-aligned activity that will help students succeed as learners?
How do we present these ideas to middle school students so they understand that everyone’s mind is different and we need to be considerate of each other?

How do we create the balance between keeping stress responses in check while keeping the brain engaged?

Many students who have been exposed to trauma spend so much time reacting in a “fight, flight, freeze” mode. What one proactive and what one reactive strategy do you suggest for these students?

At what age should we expect students to be engaged in self-monitoring and self-awareness for their own learning?

What could I quickly share with teachers that they can use immediately in their classrooms?

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• Completed the post-webinar quiz with a passing score of 80%
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To receive CE credit:

• ASHA members: No action necessary if your registration included valid ASHA membership ID & contact information
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Questions? Email SPEDForum@presencelearning.com

Look for follow-up email soon with the link to webinar recording and associated materials.