# Transcript

**Dr Judy Willis on the neuroscience of learning**

 **You were a classroom teacher for 10 years, what 3 strategies can teachers implement to improve student engagement?**

Dr Judy Willis:

When I went into teaching, my goal was to apply neuroscience from my neurology, years of neurology practice to the classroom.

And my focus was on things that I knew from neuroscience. So it was about attention, emotional self-management, and regulation of memory or improvement of memory.

So of those three, I'd say attention, be sure that there's something unusual to captivate interest for emotion, lowering stress by reducing frustration and boredom, and improving opportunities for memory by activating prior knowledge.

**How does understanding how humans learn help us to develop more effective teaching strategies?**

Dr Judy Willis:

Especially for teachers who are experienced. It's useful to know why your best strategies work and you know you have them and you use them. But when you know why they work, you can apply them to a broader range and you can apply them to more students and you can explain to other educators, as most of you are teacher leaders, you can use that knowledge of the neuroscience to share what you know with the backup from science.

**How can parents support the neurological growth and development of their children?**

Dr Judy Willis:

From the very beginning, parents can support the neurologic growth and development of their children by communicating, by having conversations, by recognizing yeah this is a tiny baby.

It's not a tiny adult, but it still is somebody with a great developing, powerfully developing brain.

So communicating from an early age, conversations with emotion in your voice, that tends to make a difference. Not just monotone, but expressing, chatting with your child in an adult tone. Sometimes not just baby talk is going to start their neural development on the road to literacy and even numeracy.

**Why do you recommend explaining how humans learn and how the brain works to children and young people?**

Dr Judy Willis:

One of my big desires is for children and young people to know how their brain works.

Especially those kids who have developed the impression maybe because they've been told it by less informed teachers that they are not doing well because they're lazy or not motivated or not intelligent, or don't really try to pay attention because it's important for them to know, especially for their behavioral outputs, how they pay attention, how they respond to stress, that when they are behaving in a way that people are disturbed by, when they're acting out, when they're zoning out, that those are their brains doing what they're programmed for.

When students know how the brain responds to that stress state, especially from sustained or repeated boredom and frustration in a learning experience, it will shut flow to the higher brain. It will put the brain in the reactive state for survival, and it will act out, the zone out.

So kids need to know that they are not forever going to be that person that they've been told they are or self believe they are, that they can, with the help of their teachers and parents, build the strategies to recognize when their stress levels are building and use top-down control from their upper brain to chill out their emotional filter and resist those acting out and zoning out.

But it's important to know that it's not that they're deficient. It's that their brain is still trying to survive.

**What is ‘Executive functioning’ and what are 3 tips for developing it in students?**

Dr Judy Willis:

Very important opportunity during the school years is the development of the neural networks of executive function.

These are networks that are developing in the prefrontal cortex from birth, but particularly rapidly during the school years.

And that rapid phase of development means that opportunities to use the executive functions is going to trigger that neuroplasticity.

The more you use it, the more firing, the more wiring. So using activating these circuits during these very responsive school years is going to double the benefit, not specifically double, but powerful.

So the executive functions that we want to give kids the opportunities to exercise and practice and develop are things like organizing, prioritizing, making judgements, cognitive flexibility, thinking of more than one interpretation alternative, the ability to use their executive functions to do top down focus and top down mitigation of their emotional stress state.

**You talk about the ‘Neuroscience of joyful education’. In a nutshell, what does that mean for students, teachers, and parents?**

Dr Judy Willis:

For the brain to be able to most successfully learn, we don't want that survival state. We don't want that high stress state where flow is blocked from the intake to the prefrontal cortex and memory. We don't want it blocked by this emotional filter, the amygdala, right in the middle.

And when we provide the conditions, the opportunities for this stress level in this amygdala to be low, then we are facilitating flow of information from there. What they see and hear into the prefrontal cortex.

The opposite of the stress and perceived threat state is the Goldilocks zone of joyful learning and keeping in mind that kids are bored with curiosity, it's important for survival. They're naturally curious. And as they go through the school year sometimes because things are more linear, do this, do this, do this, some of the joy is deleted.

So the more often we can incorporate their joy, their smiles into their learning experiences, actually, it's not wasting time. It's accelerating the learning process.

**In your opinion, what are some of the biggest influences on a child's neurological development?**

Dr Judy Willis:

A child's neurological development is something that we are knowing more and more about and instead of the opinion that it was nature more than nurture, it was your genetics that are going to more specifically determine your outcome in life.

Well, genius is much more than genes, and we now know that environment experiences can impact ultimate success and skill.

We know about neuroplasticity that activating a circuit, whether it's how to kick a football, how to keyboard, how to ride a bicycle, or how to add fractions.

The more those circuits are activated, the stronger they become.

So knowing about neuroplasticity that activating circuits, using knowledge together is a profound opportunity for learners to make those circuits stronger and build the brain that they want.

Because we wake up with a new brain every morning and what one does with their brain during the day, the experiences, the thoughts, the opportunities are going to change for a better brain the next morning.