Learning Through Discomfort: Transforming Educational Spaces for Intellectual and Emotional Growth

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If all goes well, we will:

1. Explore the definition of pedagogy of discomfort and how it connects to higher education;
2. Imagine ways we can move forward through discomfort in ways that centers our and our students' humanity.

What does it mean to *learn* through discomfort?

Think of moments in your own life when you were pushed out of your comfort zone—how did it feel? What did you learn, and how (or if) did it transform you?

What does it mean to *teach* through discomfort?

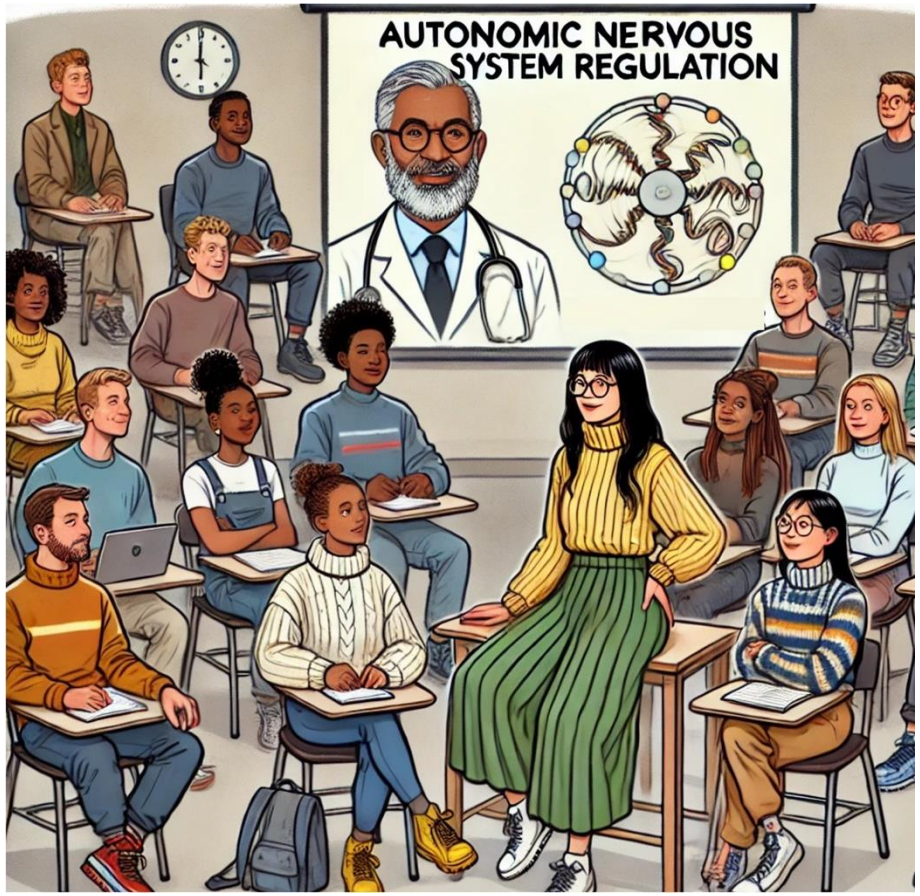
How does it feel to guide students into spaces where they might experience unease, vulnerability, or even resistance?

Two Anecdotes

→ Defend their opponent's viewpoint

- Met with lots of resistance.
- Students felt it was “immoral” to defend what they disagreed with.
- Some expressed fear of being swayed.

→ Gaining their trust was a process.

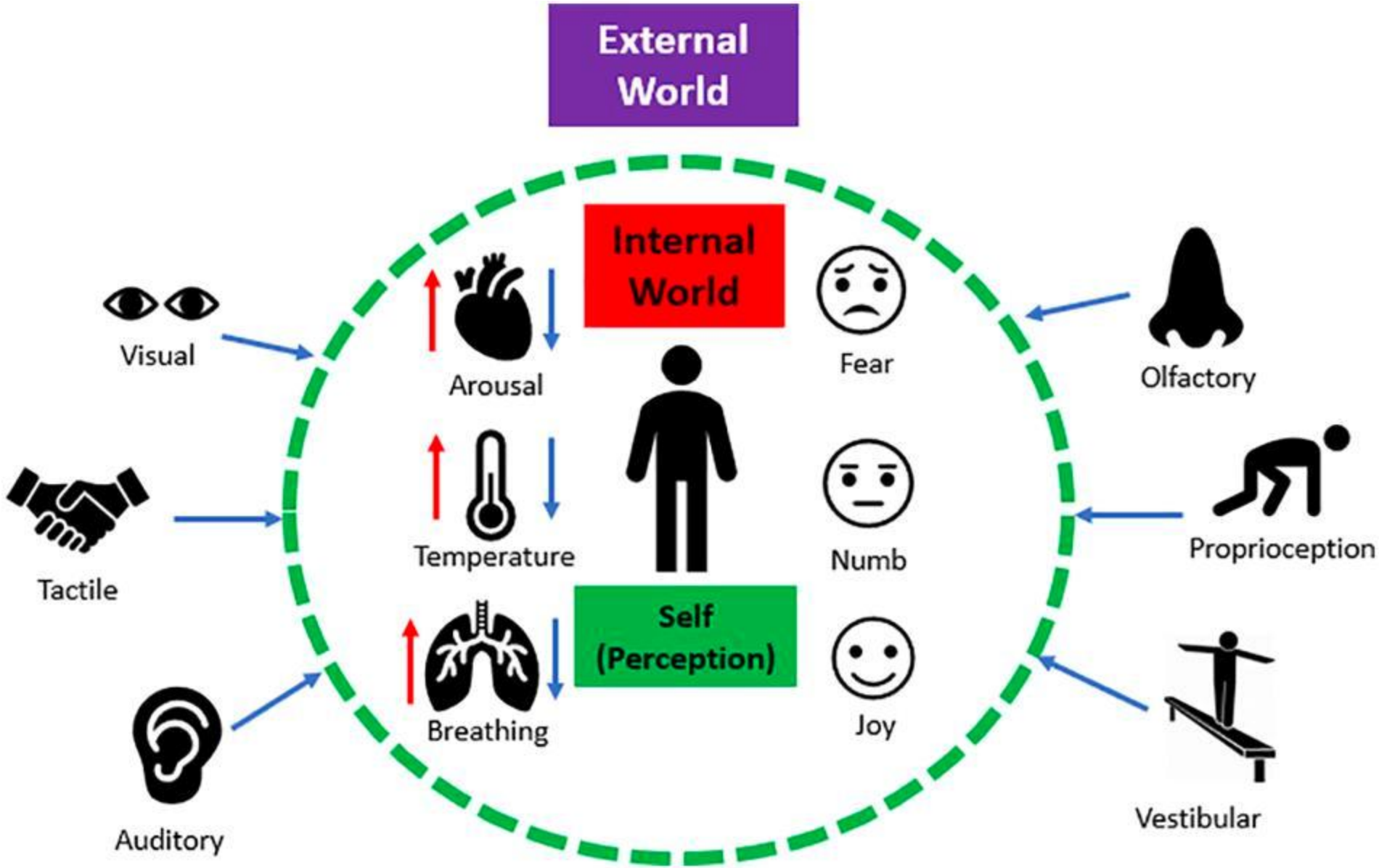


→ Learning and our identity!

- Met with disengagement.
- Wanting to disconnect and put blames.
- Tempting to bypass processing.

→ Looking for co-regulation.

Our nervous system (and body) is constantly scanning the environment …



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Neuroception

describes the neurobiological mechanisms involved in perceptions of safety, danger or life threat from

Inner
World

Outer
World

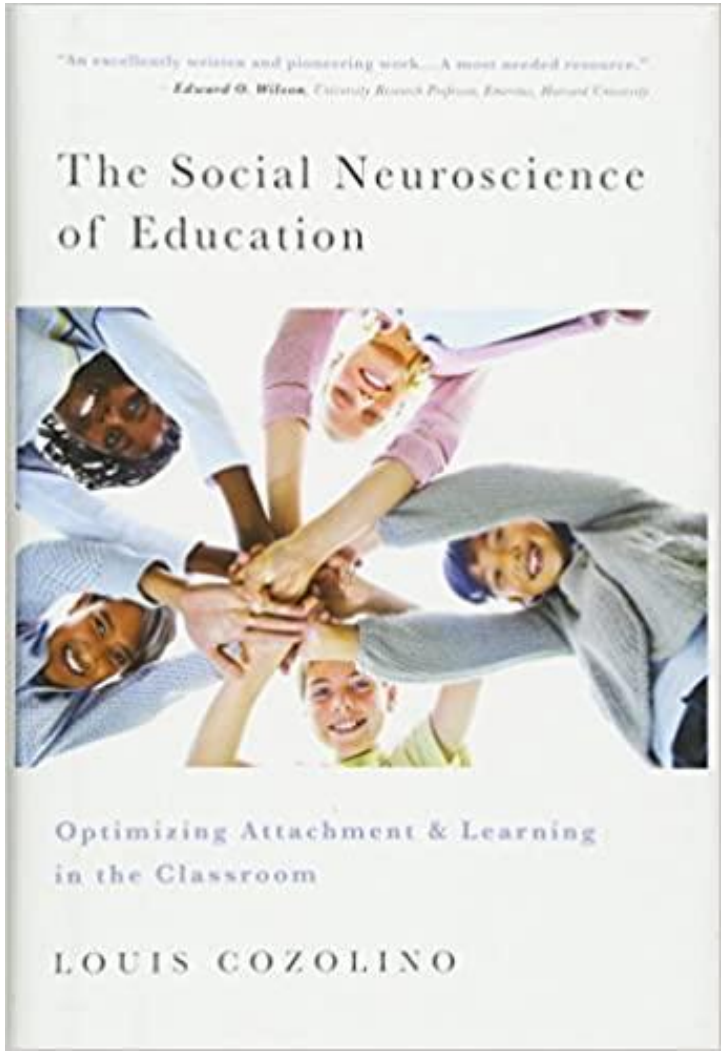
Between
Relationships

Hidden Treasure with Tracey Farrell

Adapted from the work of
Stephen Porges & Deb Dana

We are Relational

Our Brains Developed to Connect



"The human brain is very much a social organ."

Learning is Relational

Learning is Relational

We connect new information to what we know, who we are, what we value, and to the larger community and the world.

How do we learn?

Teaching & Learning = Biological Phenomena

Teaching as Brain Changing: Exploring Connections between Neuroscience and Innovative Teaching

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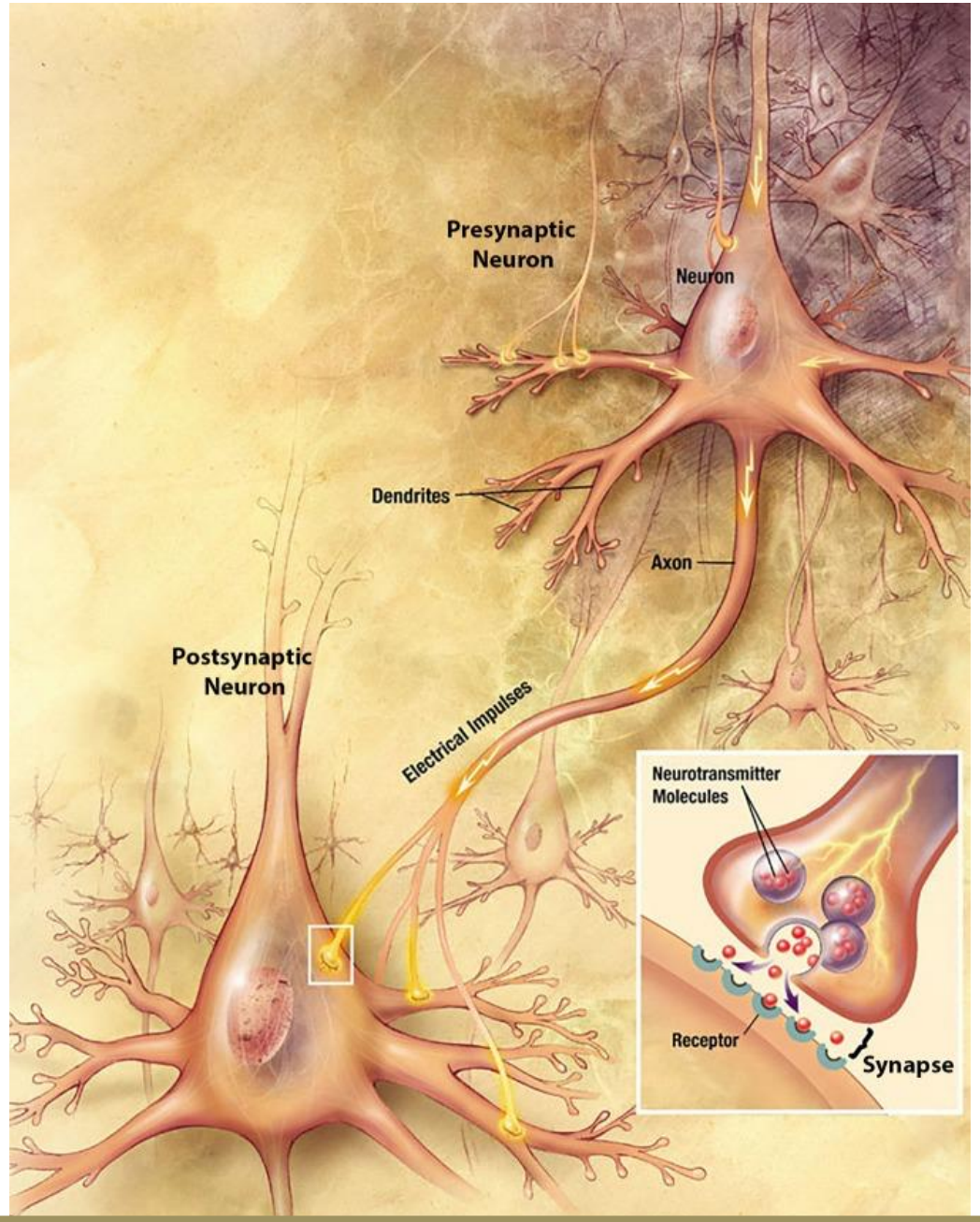
How do you conceptualize learning? Do you think of learning as a contractual agreement: the instructor performs certain actions to facilitate learning, and the student, in turn, explicitly or implicitly promises to behave in ways to receive that learning? Or do you think of learning in sociological terms: the learner, through what he or she learns, transforms his or her beliefs and becomes a more emancipated citizen of the world? Or perhaps you think of learning in psychological terms: learners are motivated, store facts in their minds, and create mental knowledge structures. All of these ways of conceptualizing learning can be beneficial in understanding how stu-



At a cellular level, learning involves changes in the structure and function of the nervous system.

The connections between brain cells become stronger through a process known as long-term potentiation.

Learning typically involves both feedforward and feedback processes.

The brain is highly interconnected, and many neural pathways loop back on themselves, meaning that learning is shaped by a continuous exchange of signals between different regions.

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Reverse the routine: Problem solving before instruction improves conceptual knowledge in undergraduate physics

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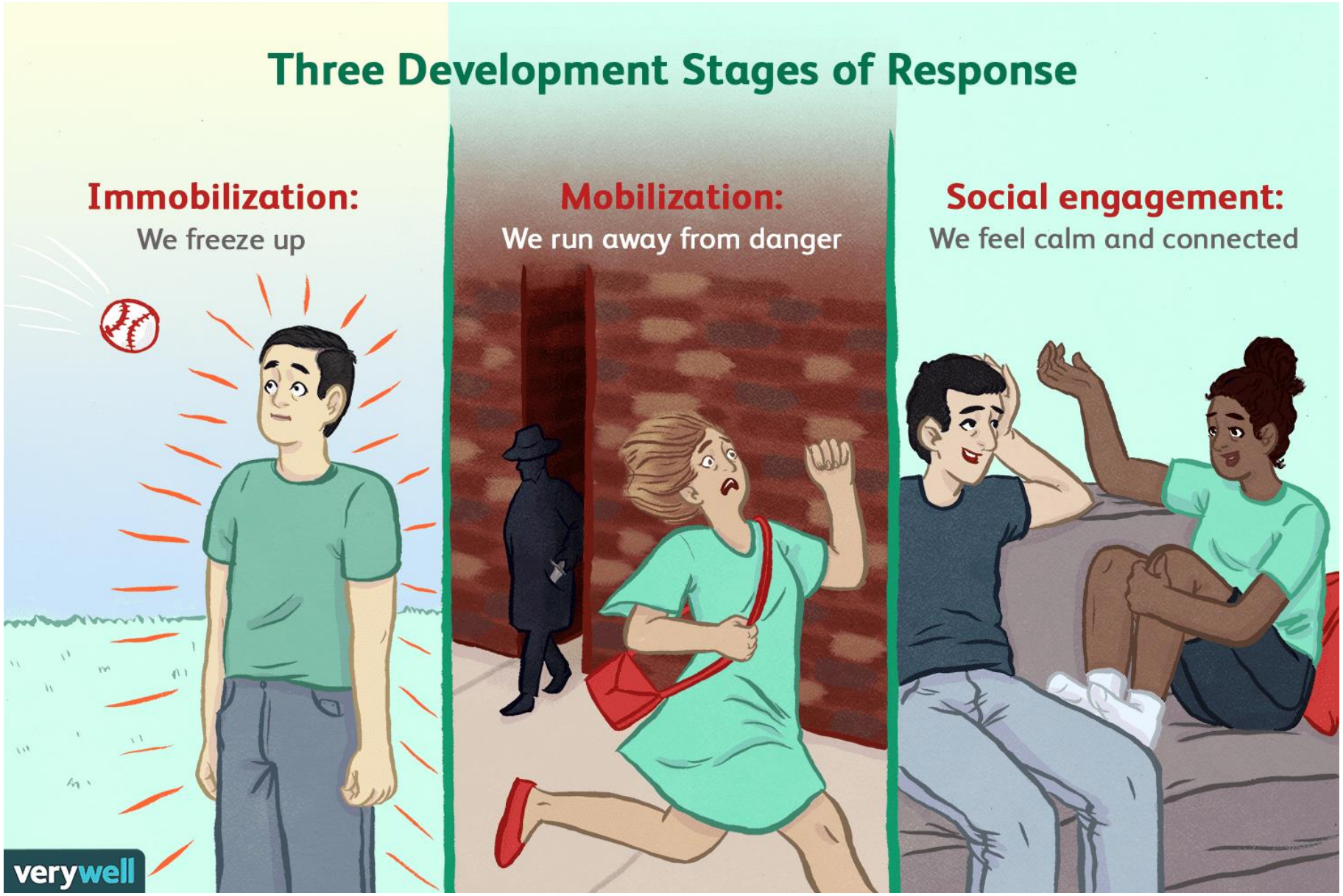
ABSTRACT

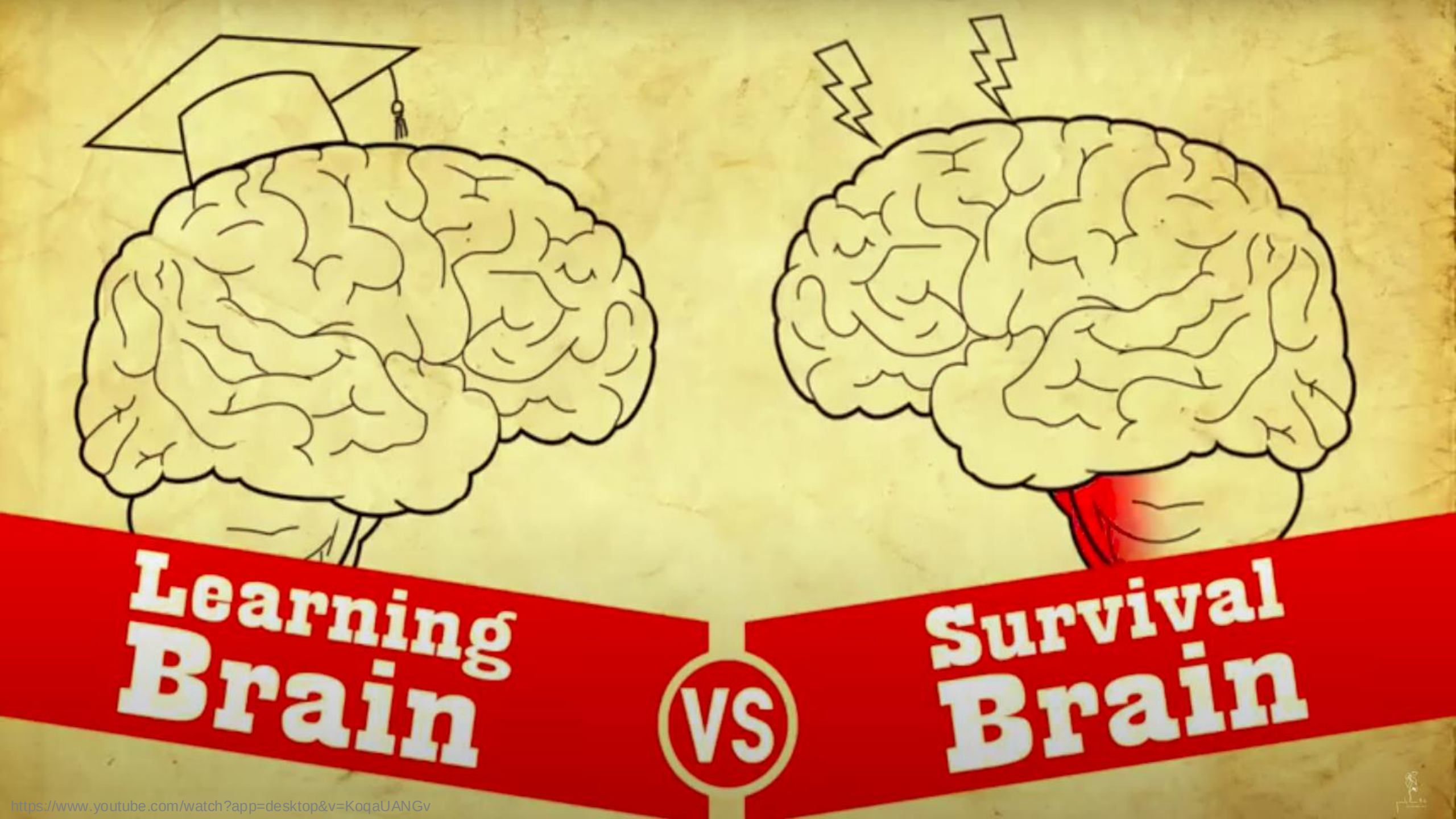
STEM undergraduate classrooms are increasingly adopting instructional methods to enhance student engagement and improve learning outcomes. For example, in exploratory learning, students explore novel problems before they are taught the underlying concepts and procedures. The current studies examined the benefits of exploratory learning in undergraduate physics instruction. In Studies 1 and 2, students worked collaboratively in groups to complete a learning activity before lecture (*explore-first condition*) or after (*instruct-first condition*). The two studies were conducted in different semesters, with different physics courses and instructors of record. Students' conceptual understanding and procedural knowledge (problem-solving accuracy) were assessed using an instructor-created quiz. Performance on the learning activity indicated that students in the explore-first condition struggled as much as (Study 2) or more than (Study 1) students in the instruct-first condition. However, on the quiz, students in the explore-first condition exhibited better conceptual understanding and equal procedural knowledge, compared to students in the instruct-first condition. In addition, self-reported interest and enjoyment were either equal (Study 1) or greater (Study 2) in the explore-first condition. Study 3 tested the effects of exploring alone versus in a collaborative group. Learning outcomes were equal across conditions, suggesting that there is no added learning benefit of exploring collaboratively compared to individually. However, interest and enjoyment were higher when students explored collaboratively, which may have long-term educational benefits. Exploratory learning, with or without collaboration, offers a useful method to improve student engagement and performance in essential undergraduate STEM courses.

MIND, BRAIN, AND EDUCATION

We Feel, Therefore We Learn: The Relevance of Affective and Social Neuroscience to Education

Mary Helen Immordino-Yang[1] and Antonio Damasio[2]


Three Development Stages of Response
Immobilization:
We freeze up
Mobilization:
We run away from danger
Social engagement:
We feel calm and connected
verywell



Pedagogy of Discomfort

→ “Invitation to inquiry” and “Call to action” (Megan Boler, *Feeling Power*, 1998)

→ Inquiries should be intertwined with an understanding of personal and cultural histories, the broader socioeconomic and political conditions.

Teaching through discomfort includes:

1. Pausing to breath …
2. Giving yourself grace.
3. Showing vulnerability.
4. Developing (or fine-tuning) clarity.
5. Communicating your intentions.

Learning through discomfort includes:

1. Challenging epistemological comfort.
2. Understanding emotional engagement.
3. Considering ethical implications.
4. Encouraging vulnerability.
5. Navigating ambiguity and contradiction.

Embracing Uncertainty

→ The Three Cs (for more, see Deb Dana's *Anchored*):

- ❖ Context: Understanding the circumstances or background of a situation.
- ❖ Choice: The autonomy to make decisions about one's actions.
- ❖ Connection: Building meaningful relationships that provide emotional and physiological stability.