# Neuro-efficient Language Teaching:
## Practical neuroELT techniques for your classroom

Workshop
12:30 - 1:15

FAB-EFL.com


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*University of Kitakyushu*

*University of Nottingham*
*University of Oxford*

45 min

# Workshop Content:

1. How does the brain learn?
2. What is “neuro-efficient” teaching?
3. Practical and theoretical examples
4. Adapting to your context

HARVARD

GRADUATE SCHOOL OF EDUCATION

# How does the brain learn?

Mind, Brain, and Education (Harvard)

**neuroELT** (Japan/Asia)

# How does the brain learn?

*Oddly, many teachers don't seem to care!*

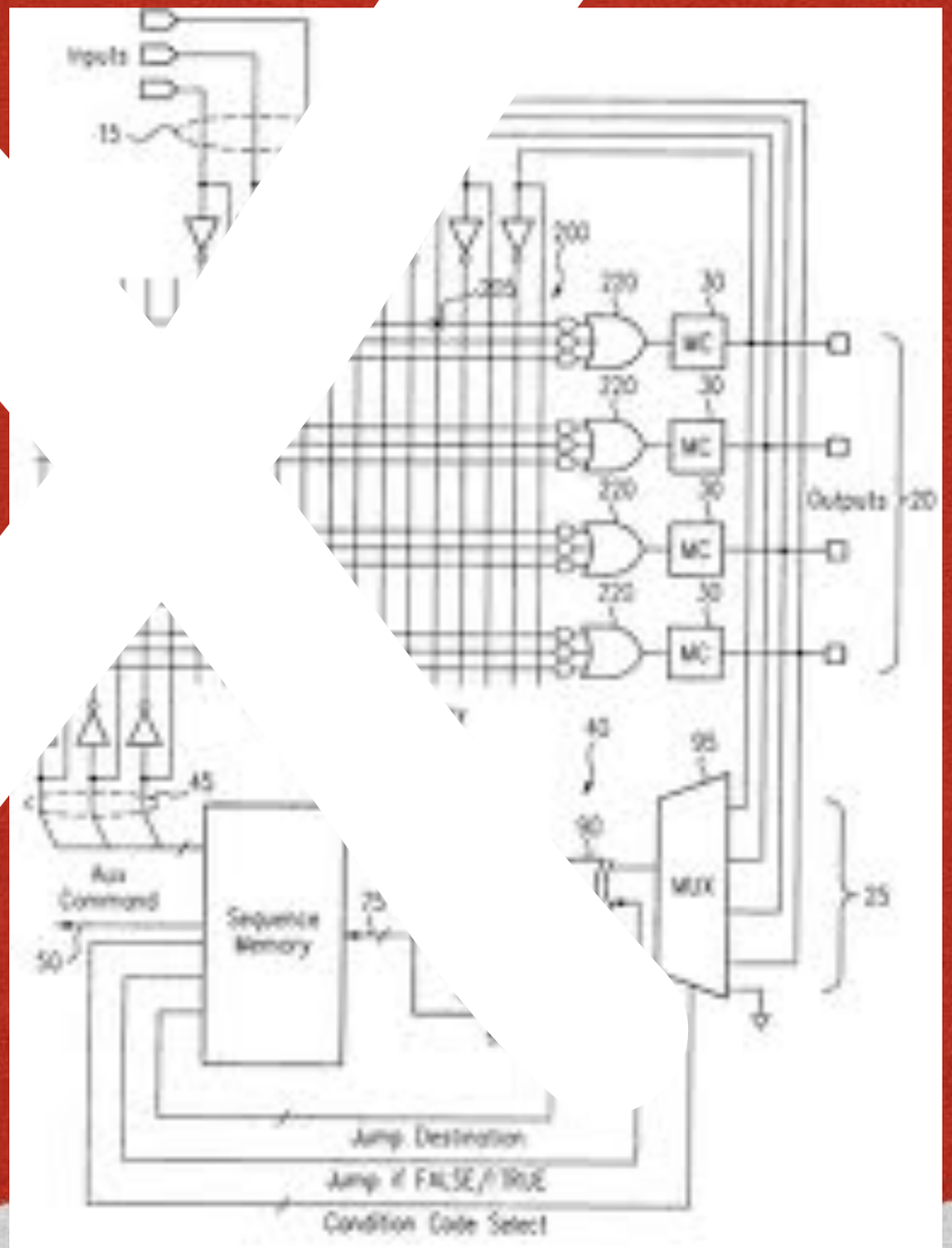
*"What's the brain got to do with learning!?"*

**Dynamic Skill Theory**

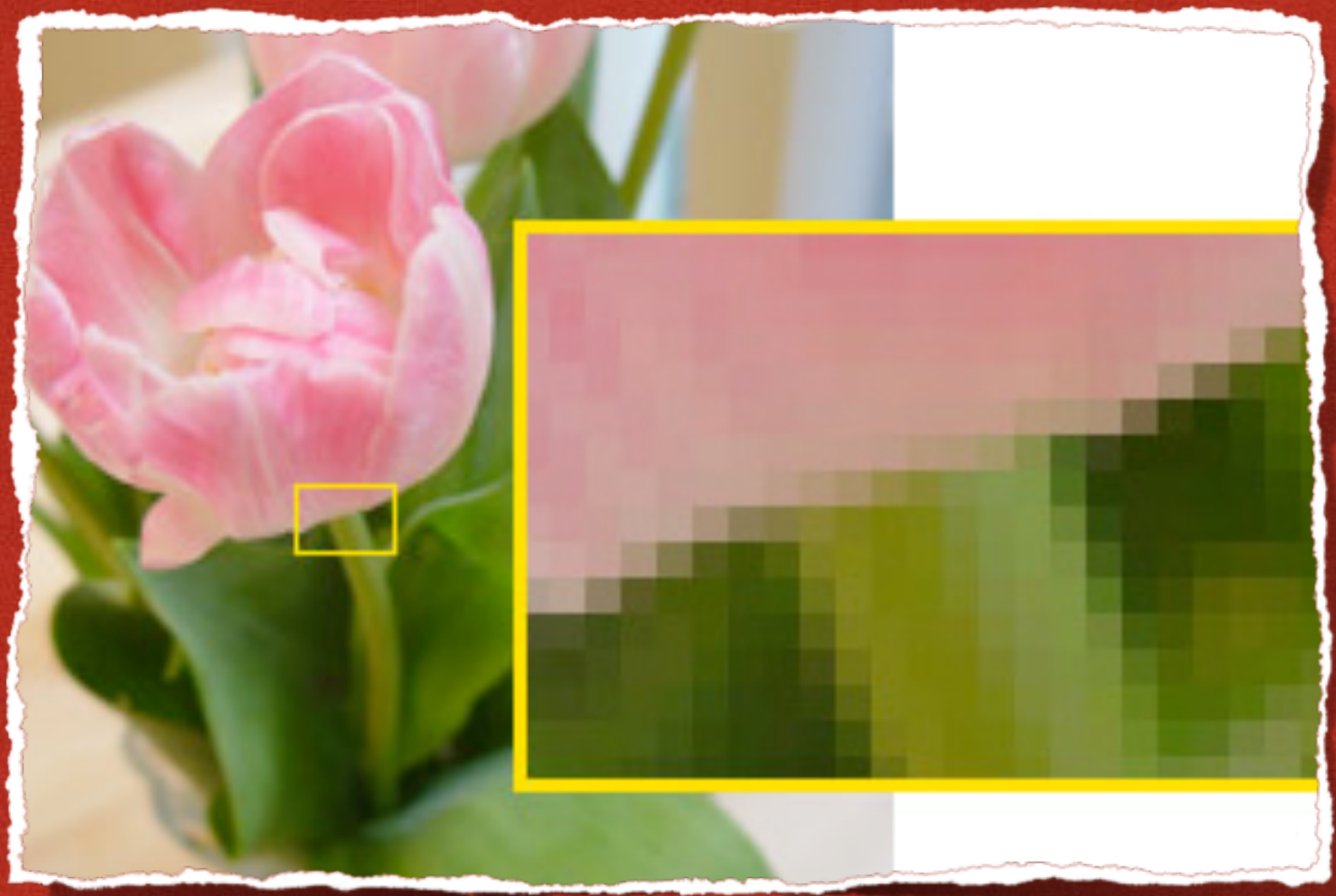
**Dr. Kurt Fischer**

# OUR BRAINS ARE NOT COMPUTERS

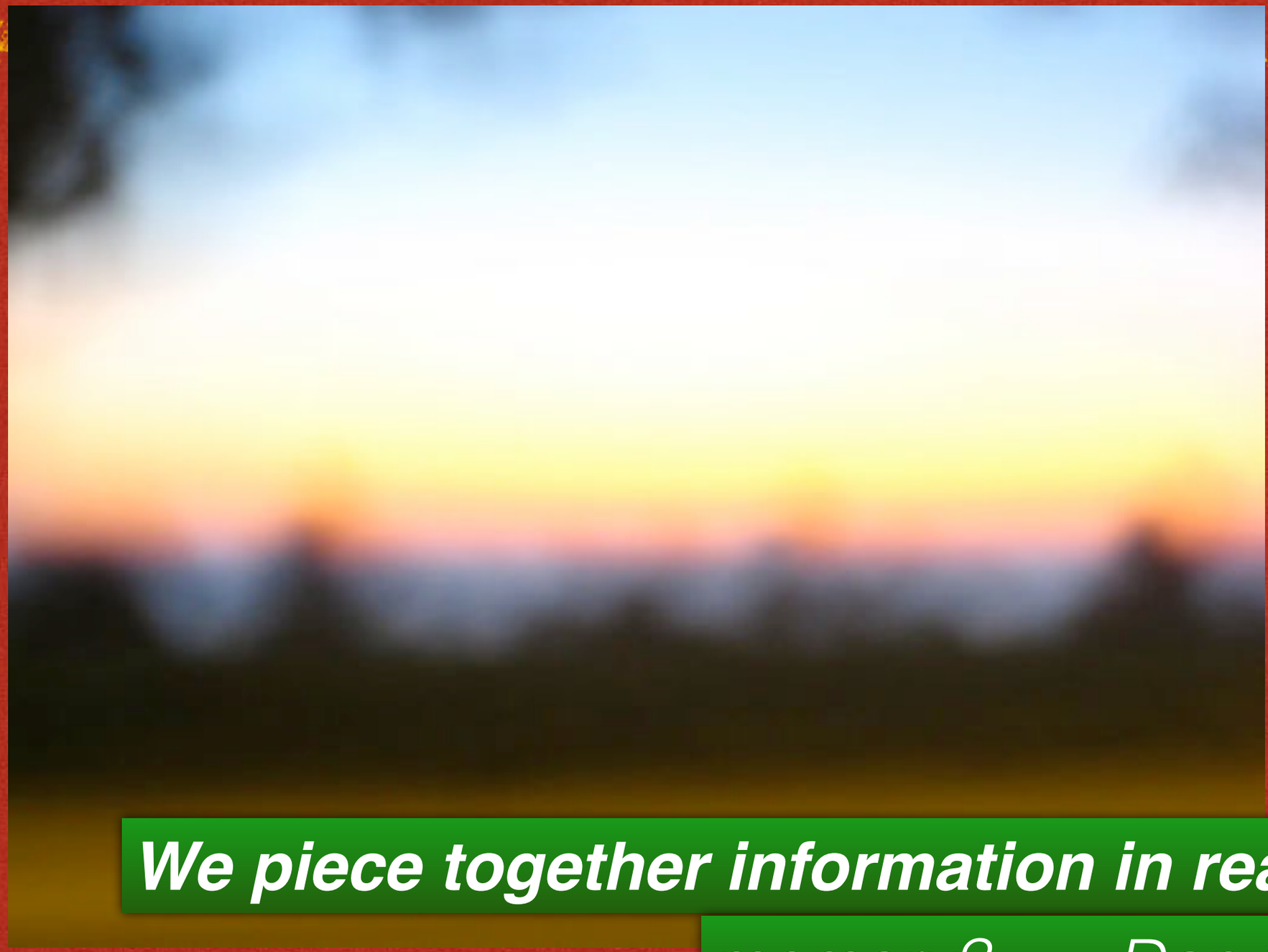
# MEMORIES ARE NOT REALLY HARD WIRED



# WE DON'T STORE THE DETAILS EITHER...



# WE HAVE GIST MEMORY



***We piece together information in real time!***

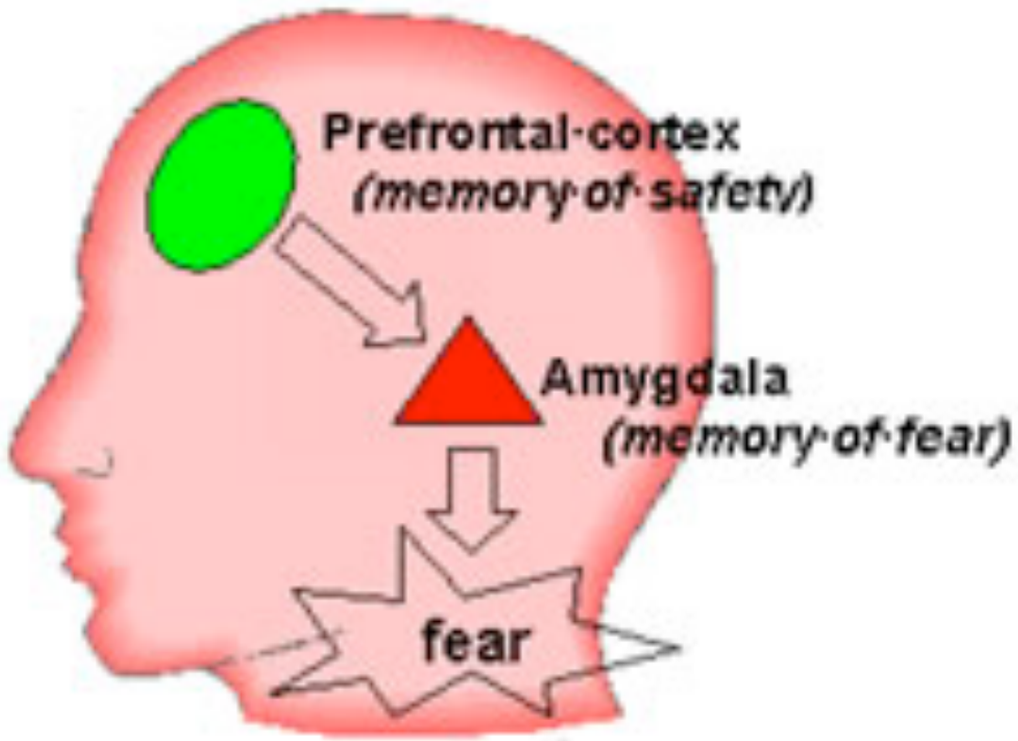
*memory?—> Dan Schacter*

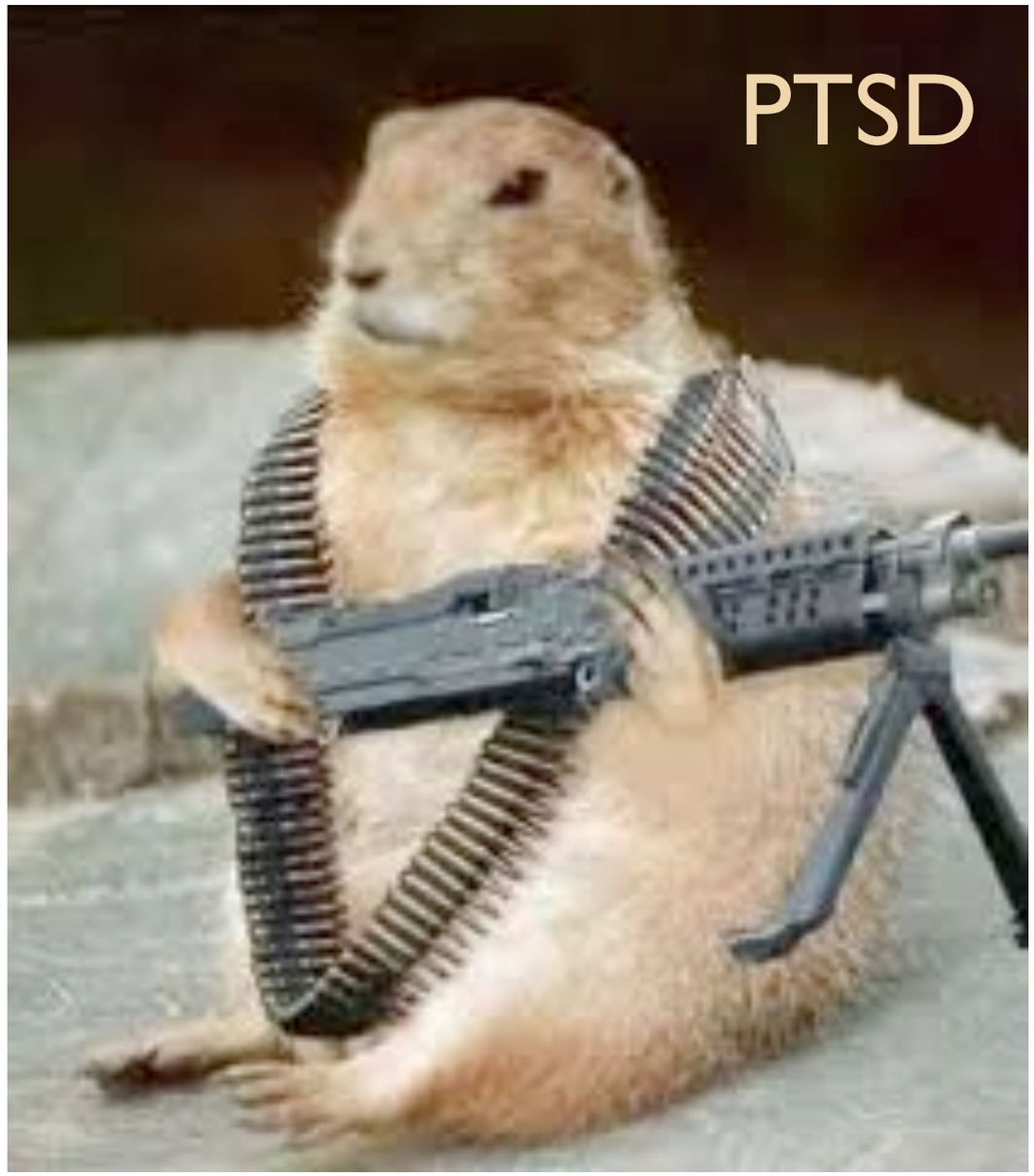
# EMOTIONS FUEL LEARNING

# WE LEARN FROM HAVING EMOTIONAL EXPERIENCES

*Antonio Damasio,*
*Mary Helen Immordino-Yang*

# OUR LIMBIC SYSTEM KEEPS "LEARNING NETWORKS" ALIVE VIA EXCITEMENT



# DOES REPETITION WORK?

*…if there is an AHA MOMENT!*

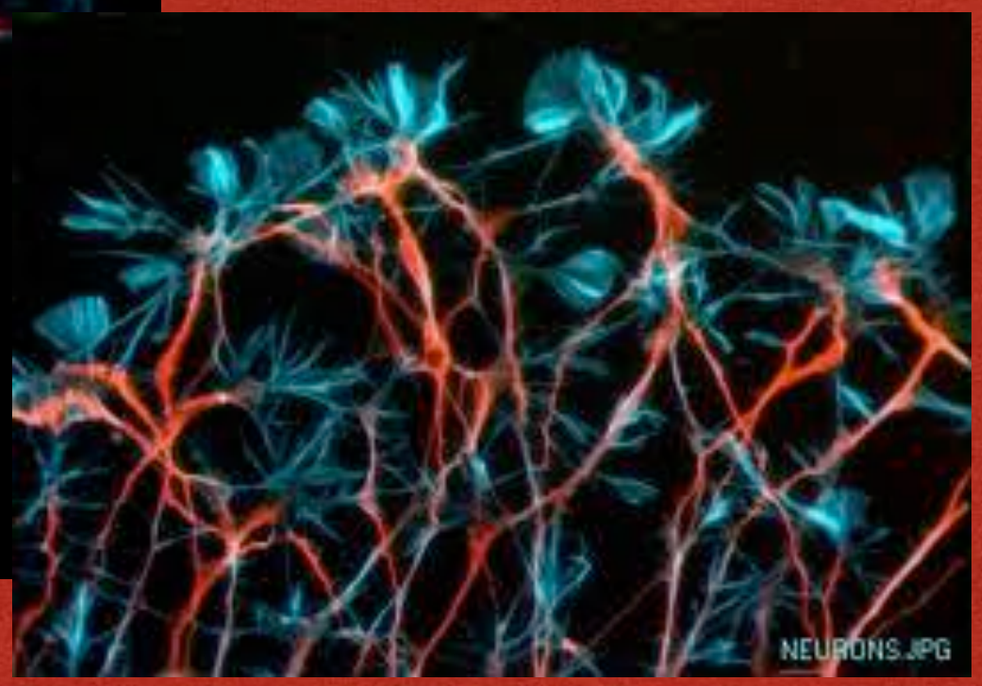
# WE NEED TO PROVIDE "EMOTIONAL PROCESSES" IN CLASS!

# WE SHOULD BUILD IN "AHA MOMENTS"!

*Find out where the Goldilocks zone is!*

# EMOTIONS, PROCESS BUILDING, AND "AHA MOMENTS"

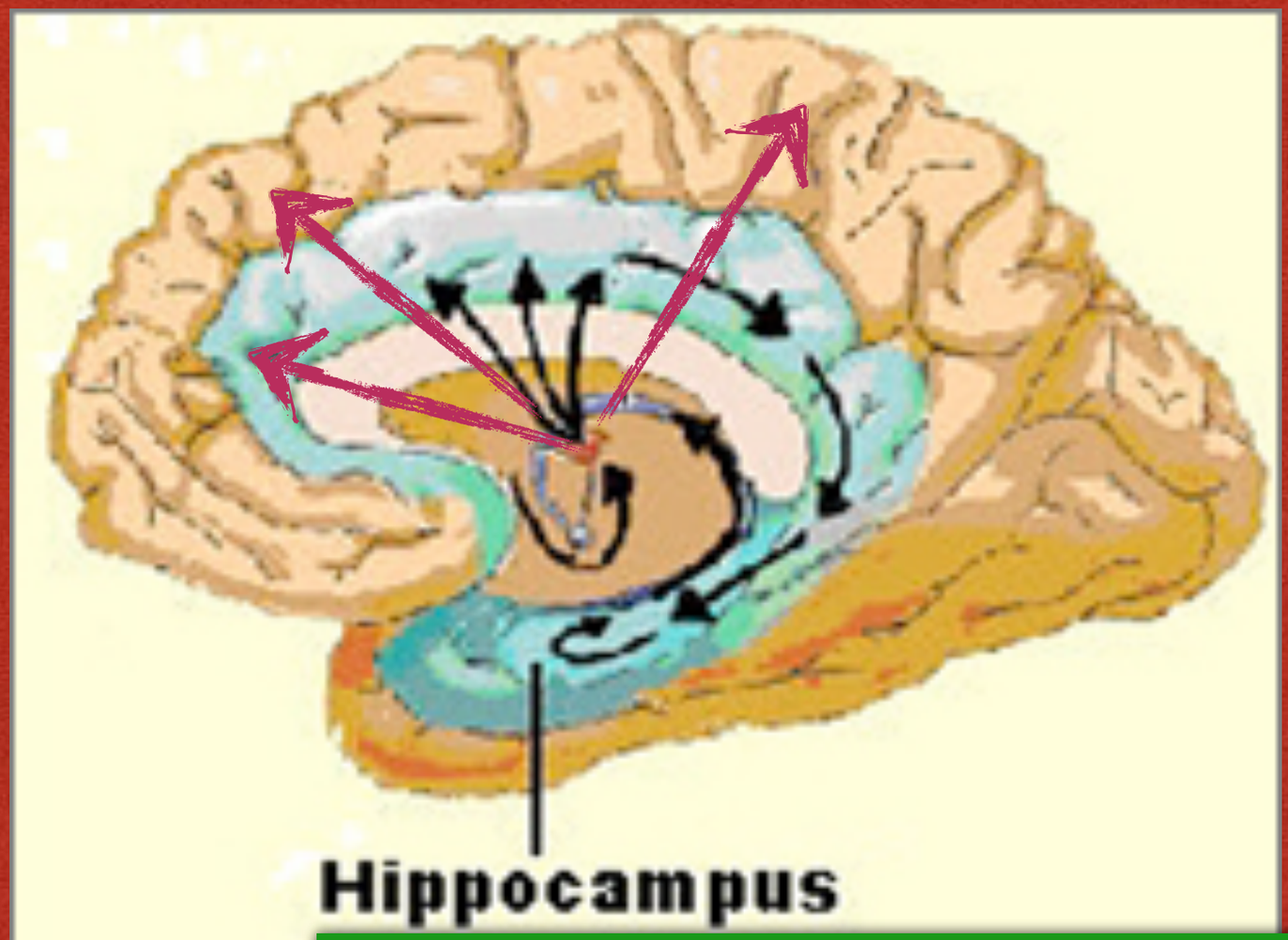
*In the Goldilocks zone!*



# WHAT ELSE IS ESSENTIAL?

*Sleep—> Robert Stickgold*

# HIPPOCAMPUS (BRAIN'S LIBRARIAN)

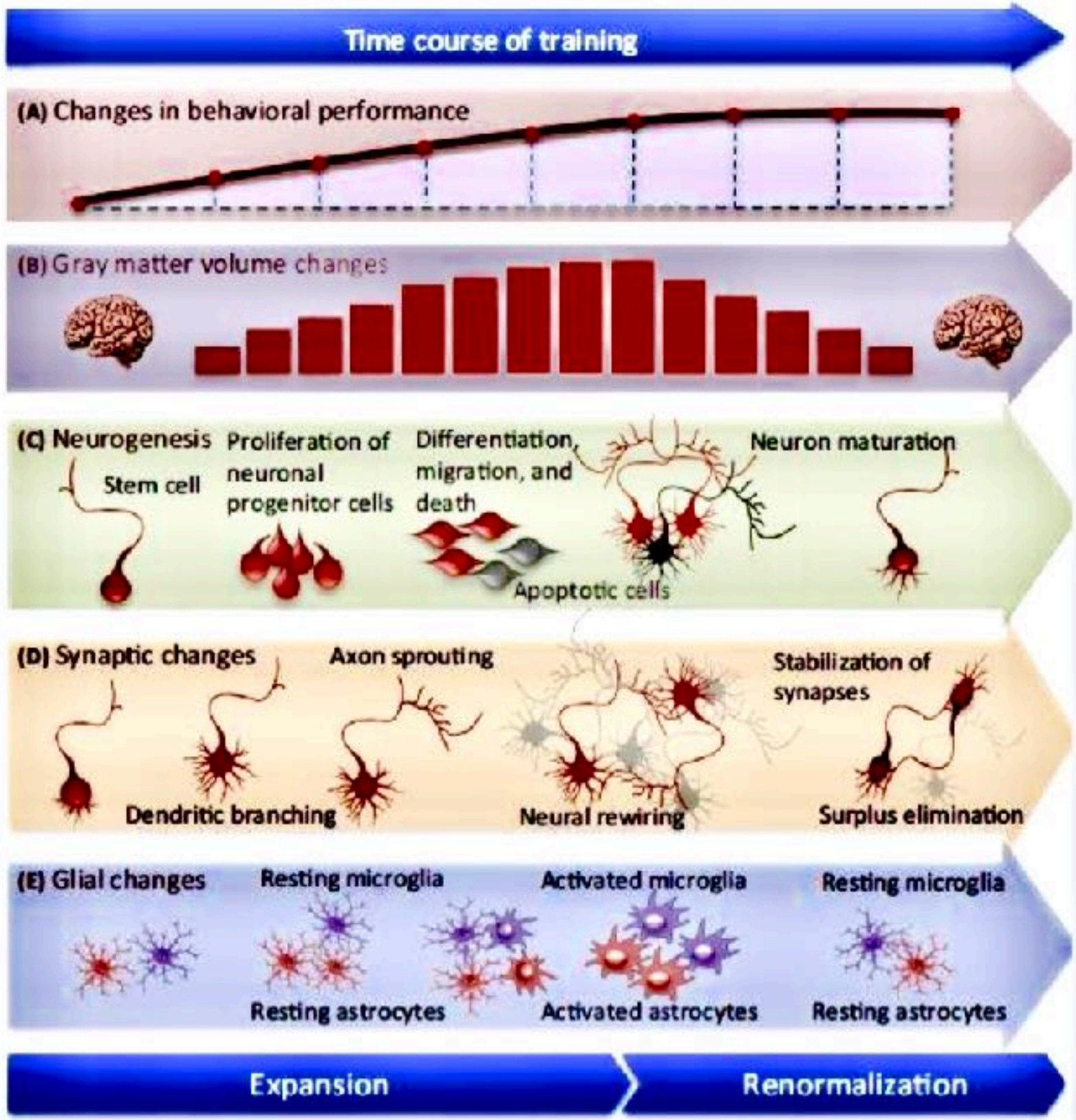



*Insight—> Robert Stickgold*

# Now let's go a bit deeper!

# Let’s start here!

*How did you get better at it?*




This is a schematic illustration of potential cellular changes underlying gray matter volume expansion and renormalization as detectable with MRI.

*Credit: Wenger et al./Trends in Cognitive Sciences 2017*

Close

Time course of training

(A) Changes in behavioral performance

Neuro-efficiency

(B) Gray matter volume changes

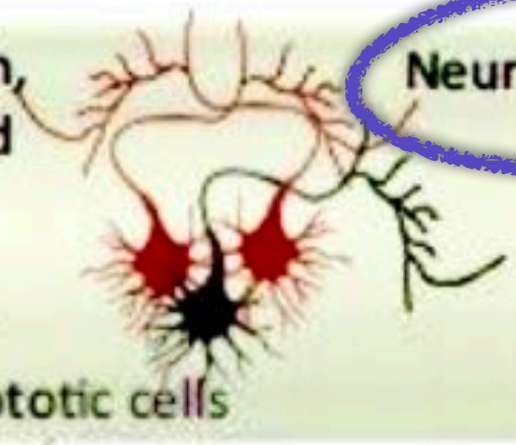
(C) Neurogenesis

Stem cell

Proliferation of neuronal progenitor cells

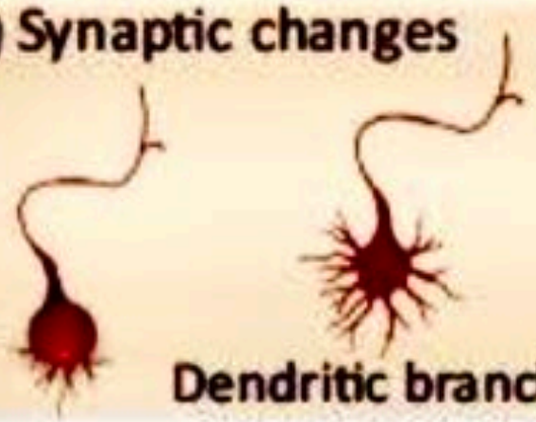
Differentiation, migration, and death

Apoptotic cells



Neuron maturation

(D) Synaptic changes



Dendritic branching

Axon sprouting

Neural rewiring

Stabilization of synapses

Surplus elimination

# Let's start h

*How did you get bette*

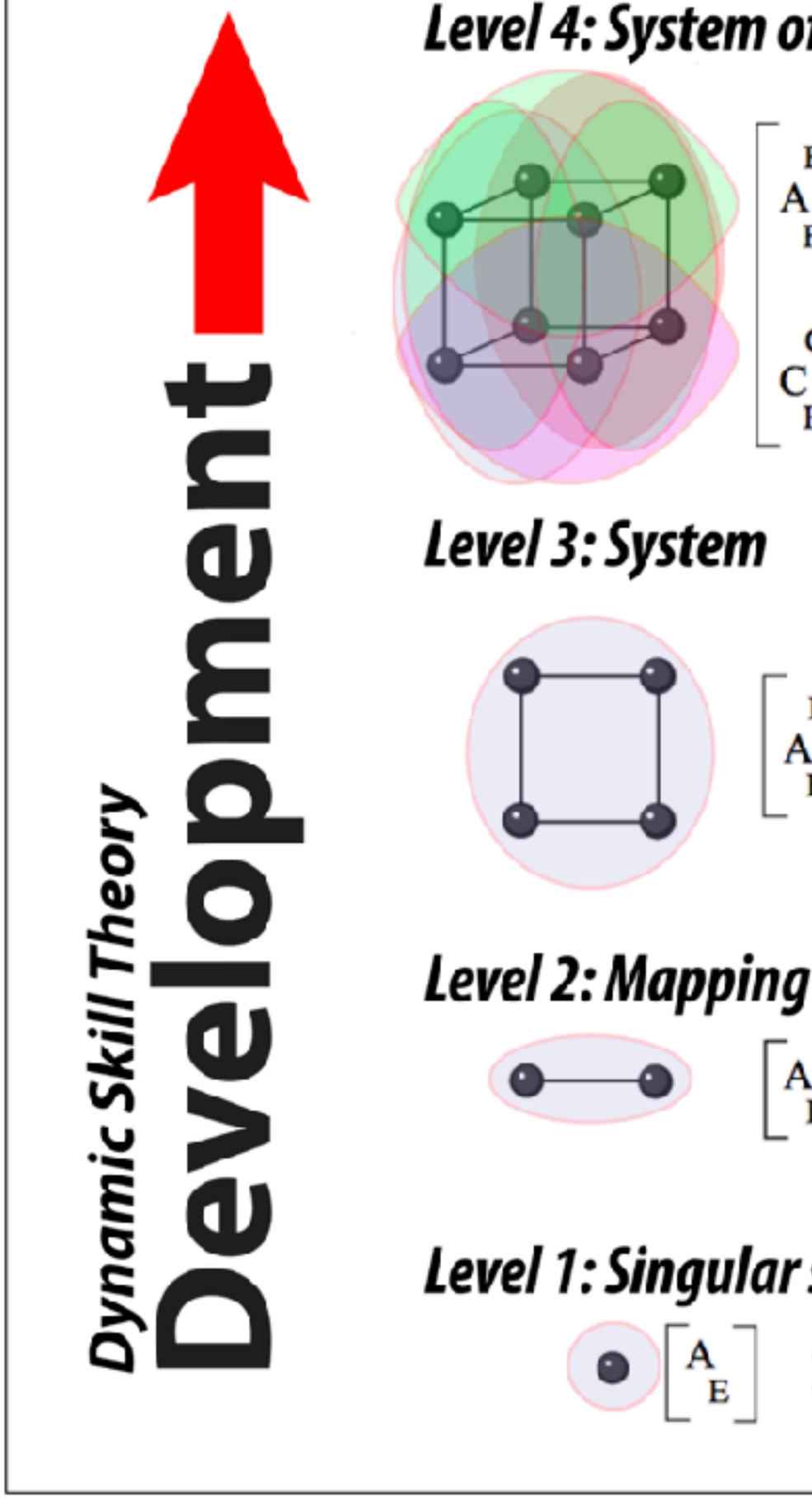



*Figure 15. Four levels of cognitive development (adapted*

# HOW DO WE LEARN?

## Dynamic Skill Theory (Fischer)

**“singular”**

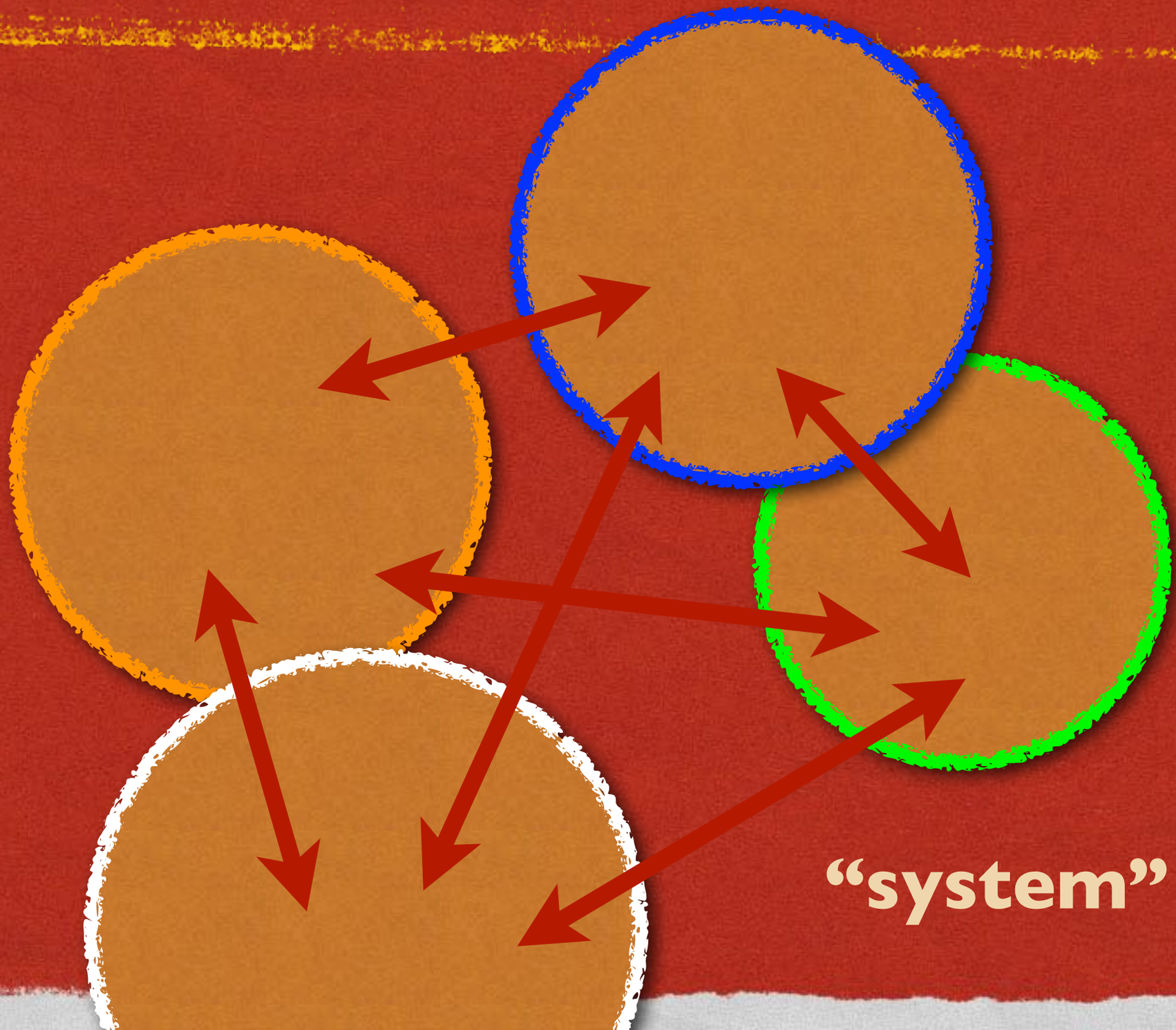
(idea/reflex)

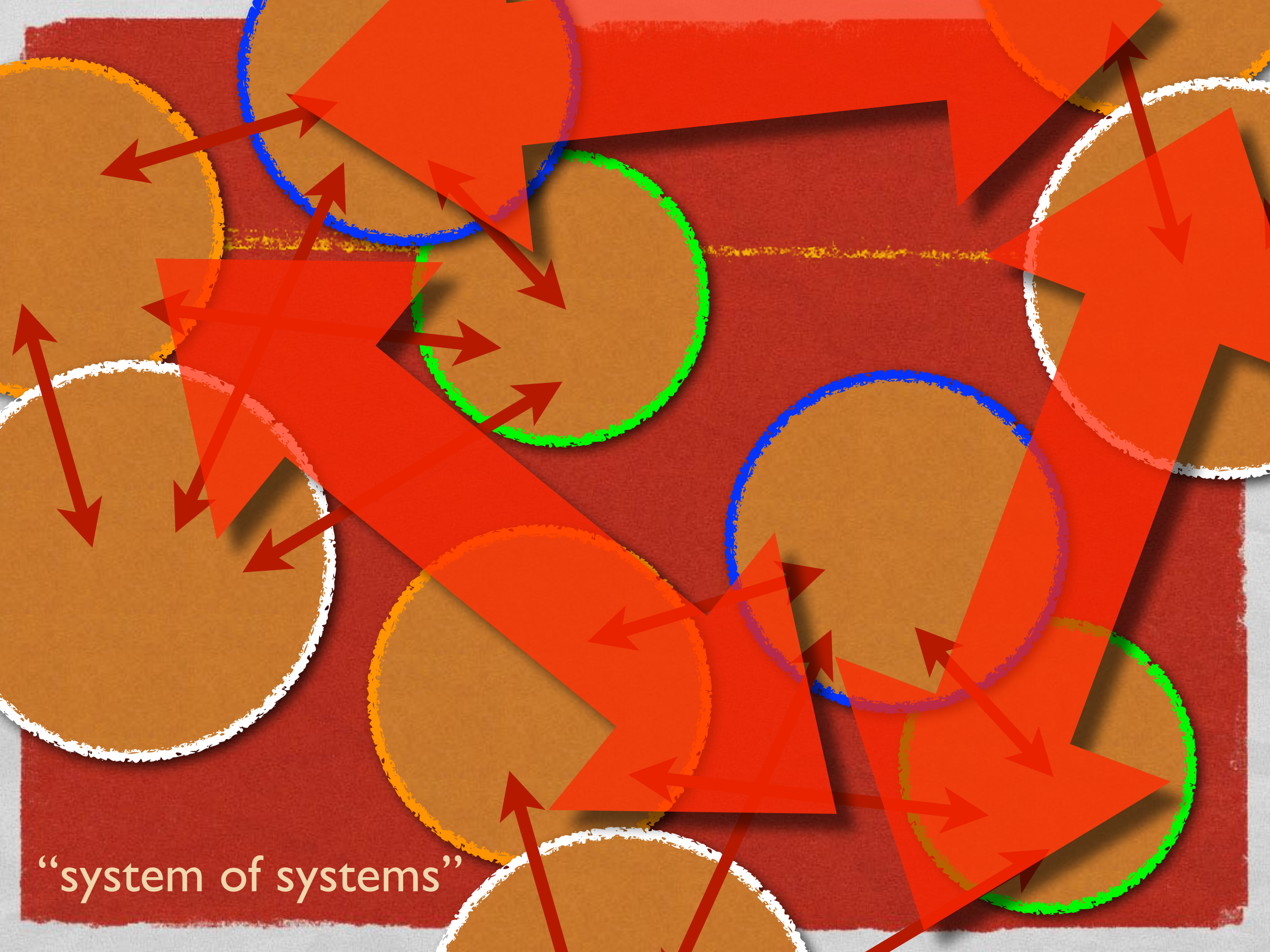
# HOW DO WE LEARN?

## Dynamic Skill Theory (Fischer)

# HOW DO WE LEARN?

## Dynamic Skill Theory (Fischer)




“system of systems”

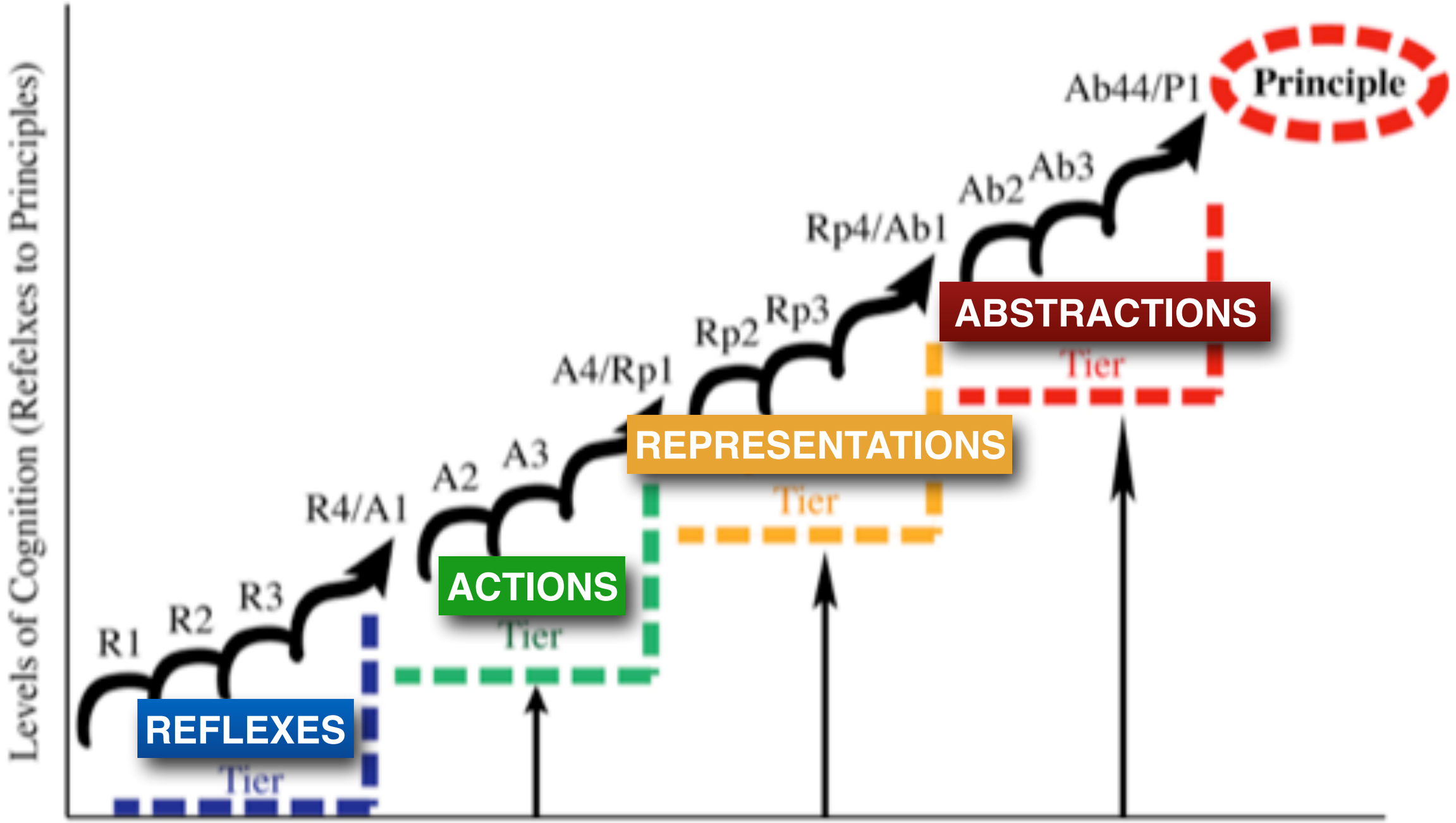



**Fig. 1. The 13 levels and 4 tiers of development in Fischer's skill theory**

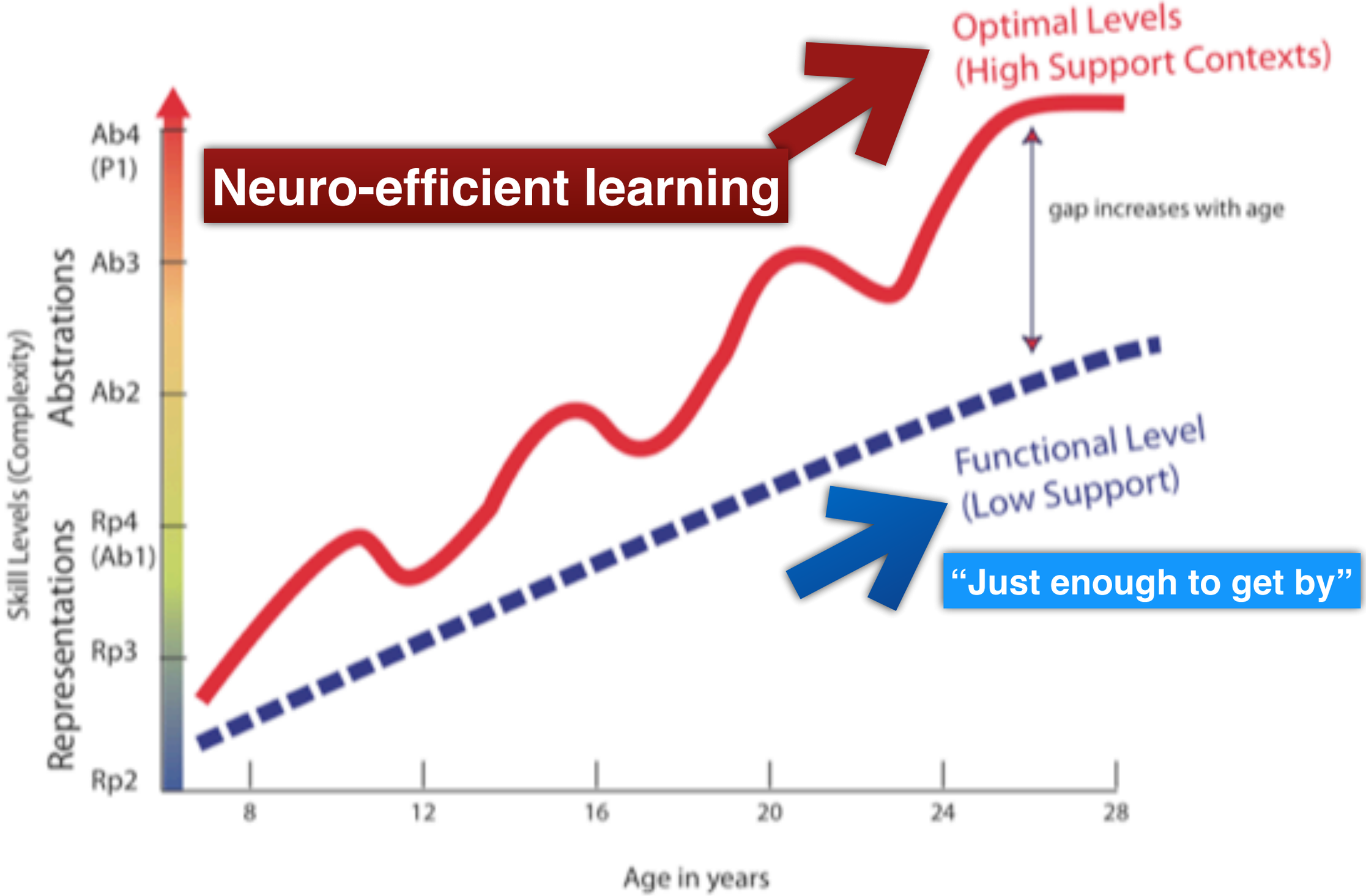



**Fig. 2. Functional and Optimal levels gap widens with age (Murphy, 2009)**

# Zone of Flow *(Csikszentmihalyi)*

## Student skills vs academic challenges

boredom

Neuro-efficiency

zone of flow

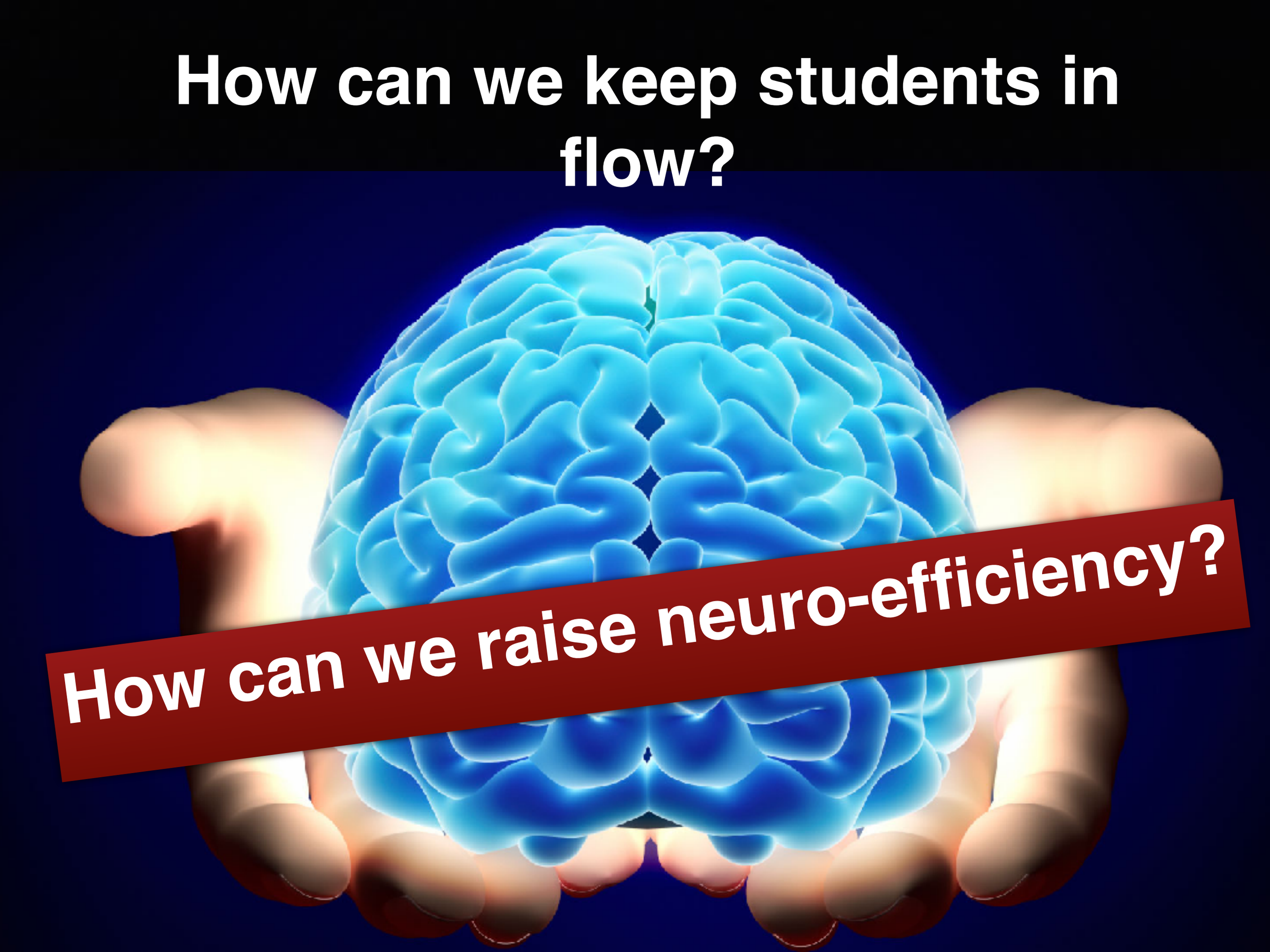
apathy

anxiety

*student's skill level*

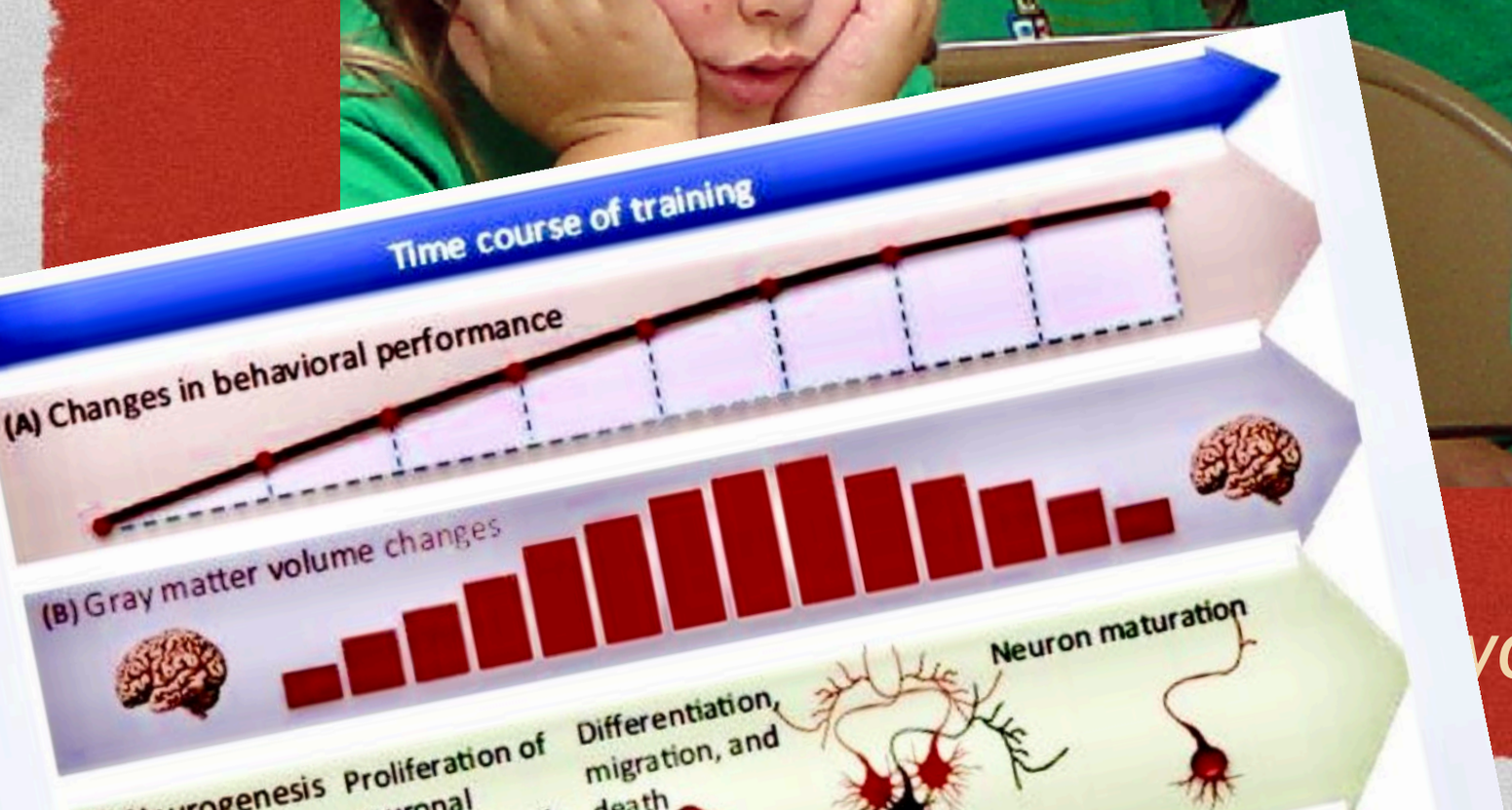
*student's academic challenges*

# How can we keep students in flow?



## How can we raise neuro-efficiency?

# Delayed feedback



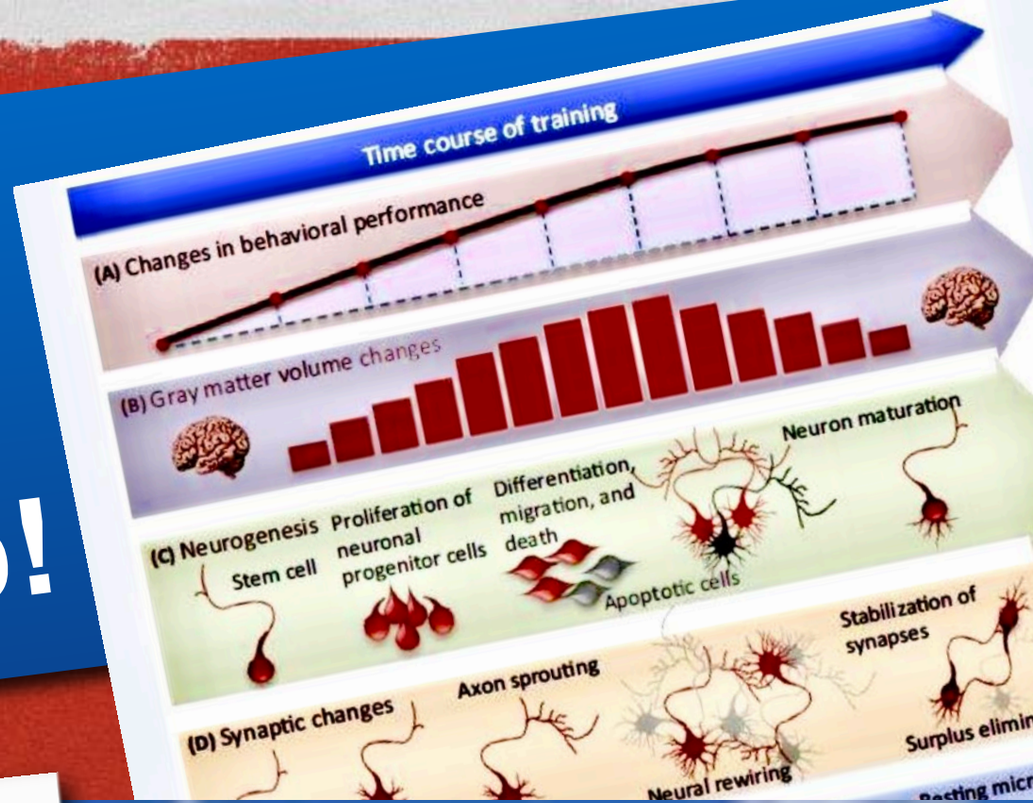

"Just enough to get by"

**Apathetic**

*worst feedback…*

# How to raise Neuro-efficiency

# -Autonomy
# -Alignment with goals
# -Feelings of ownership!



- *Keywords for great pedagogy!*

# What changes can we make?

## Neuro-efficiency

*6 tips, 6 challenges!*

Challenge #1

# Let students design the test! HUH!??

*Oxytocin*
*Vassopressin*
*Dopamine*

*Instant feedback*
*Visual cues*
*Dramatic pacing*
*Unpredictable*
*Emotional*

Group designs

Challenge #2

# Celebrate mistakes!

Challenge #3

# Differentiate the instructi

**Vertical Tiering Example:** Using "-ing" words in sentences

**HARD:** Write a paragraph, using vocabulary from a list of "-ing" words.

**MID:** Using sentence prompts provided, complete sentences using "-ing" words.

**EASY:** Fill in sentence blanks with "-ing" words.

**Horizontal Tiering Example:** Learning vocabulary

**Circle & Guess**
View a vocab list. Listen to a passage. Mark the vocab that was head. Guess the meanings. Compare with partner. Confirm.

**Draw**
View a vocab list. Draw pictures that represent the meaning of each word. Compare with partner. Confirm.

**Gesture**
View a vocab list. Imagine gestures for each of the words on the list. Test them out with partner. Confirm.

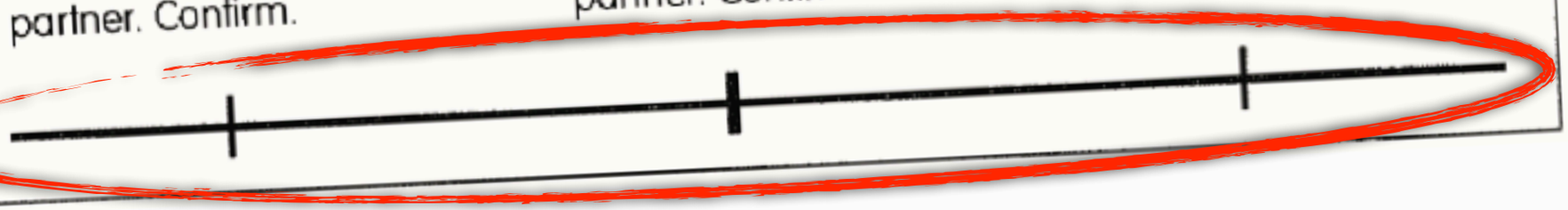
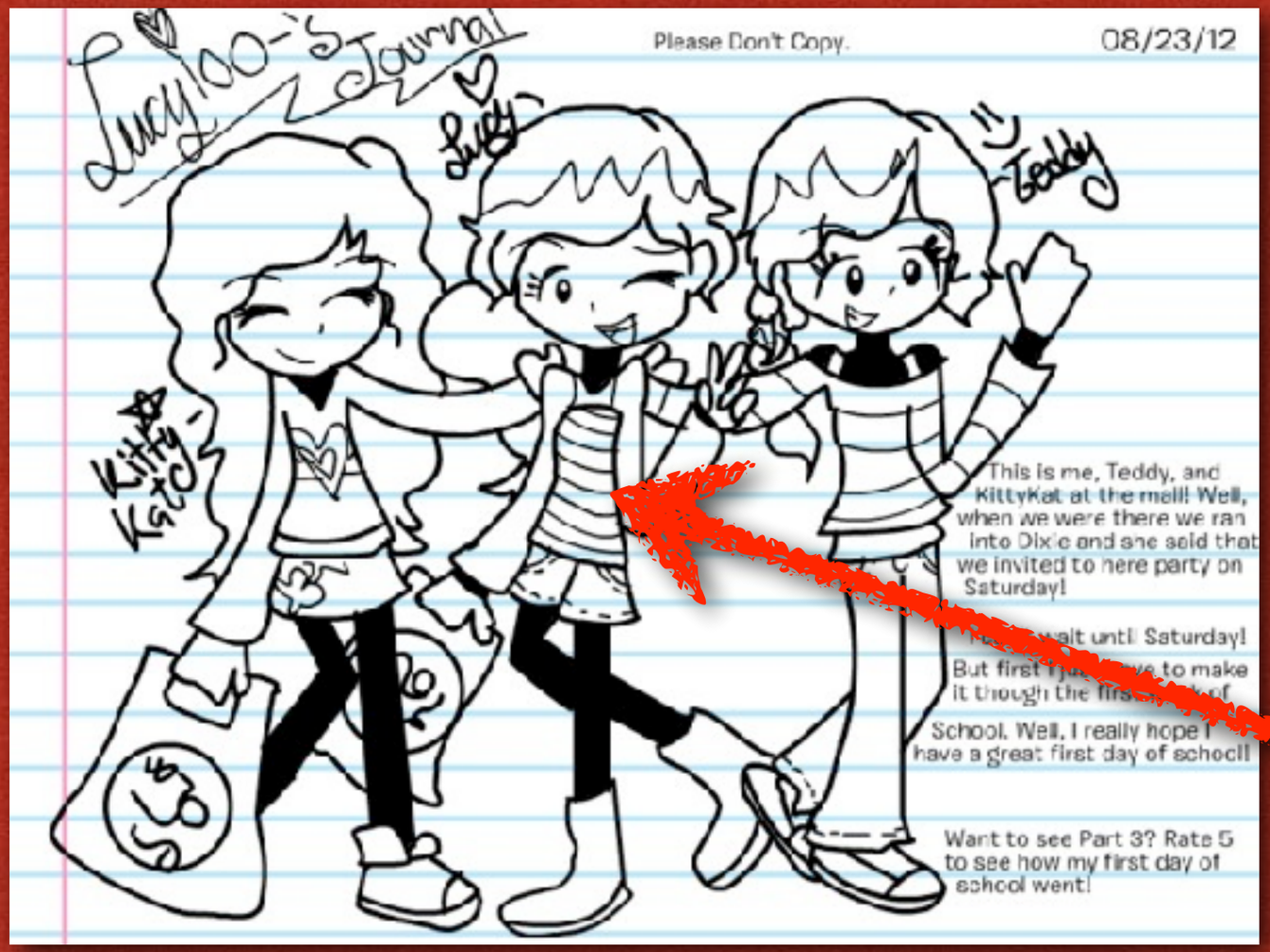


**FIGURE 5. Two Ways to Tier DI Lessons.** (Murphy, 2015)

Challenge #4

# Eliminate slow-return high-stakes tes




*replace with*

Daily journal writing!
Portfolio assessment!
Mini-presentations!

**Allow creativity to flow**

Challenge #5

# Trinity of Assessment

(Murphy)

***Self***

***Peer-to-peer***

***Teacher-student***

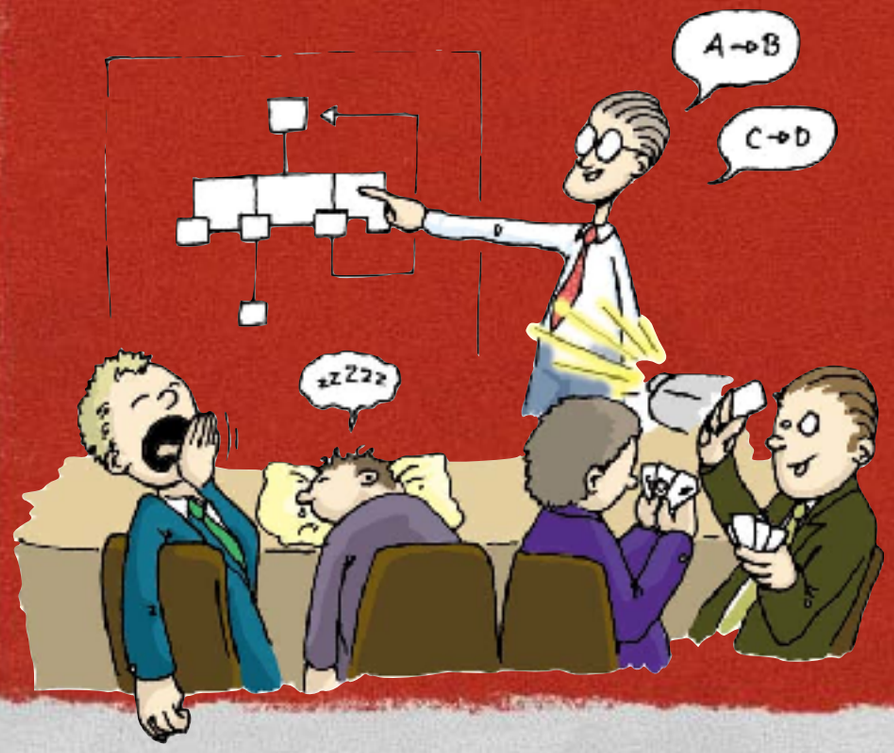
Challenge #6

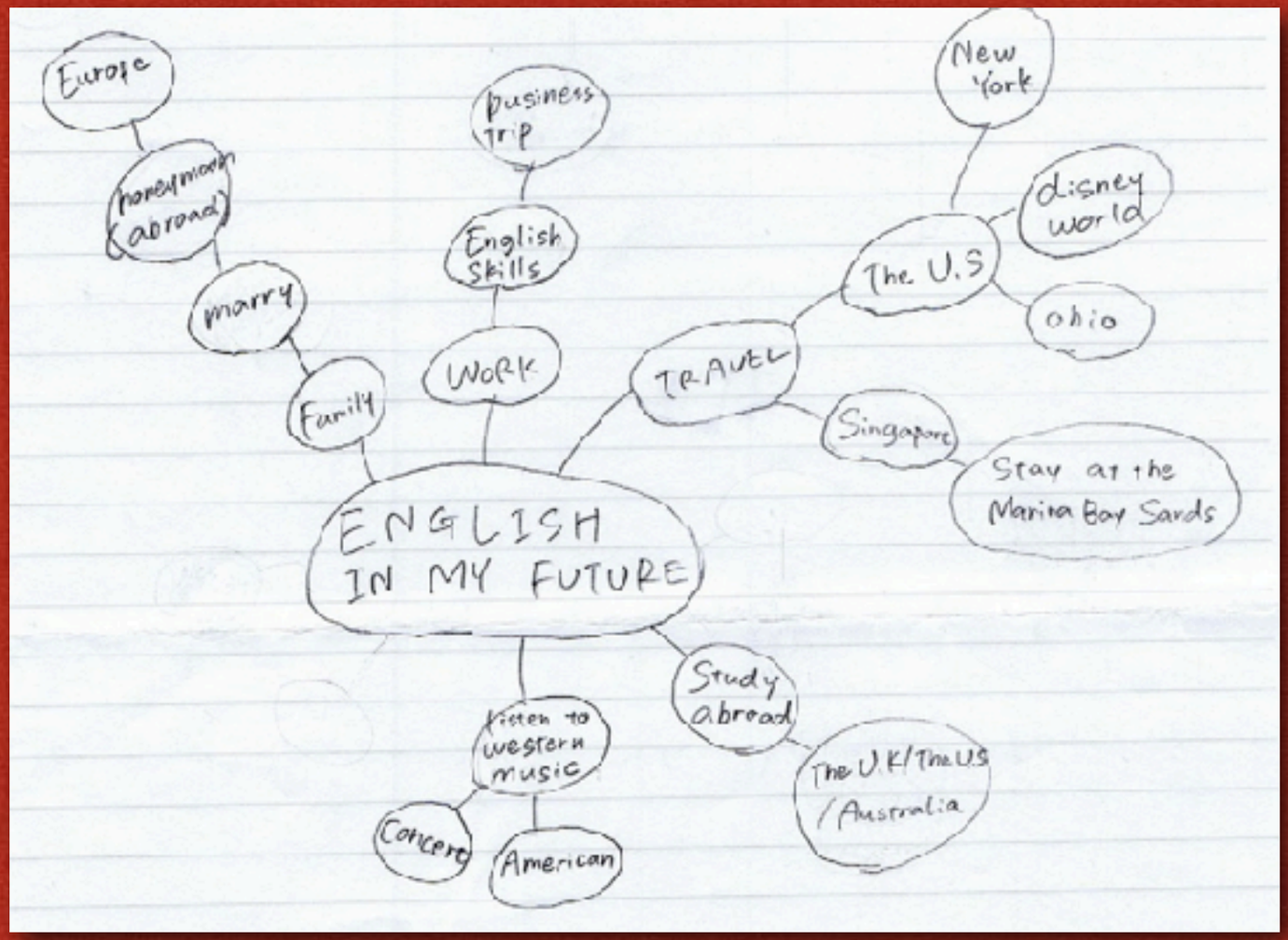
# Make Understanding Visible!

*Have them demonstrate real usage of their new knowledge*

-Have a mind map as a test!

-After presentations, **assess *student* questions!**

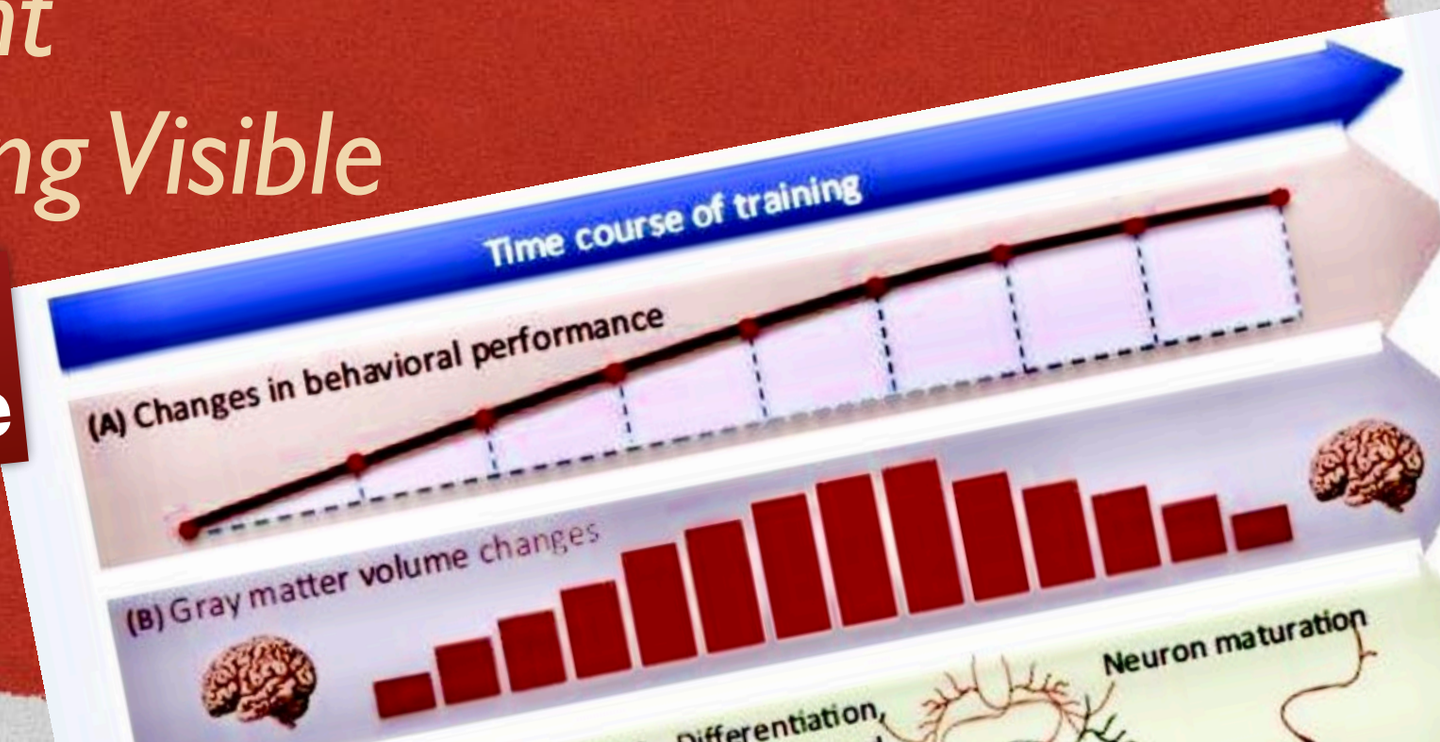


# Neuro-efficient teaching challenges:

*1. Let students design the tests!* *(group)*
*2. Celebrate mistakes!*
*3. Differentiate the instruction!*
*4. Eliminate slow-return high-stakes tests*
*5. Trinity of Assessment*
*6. Make Understanding Visible*

**Discuss: a NEW way to implement one challenge**

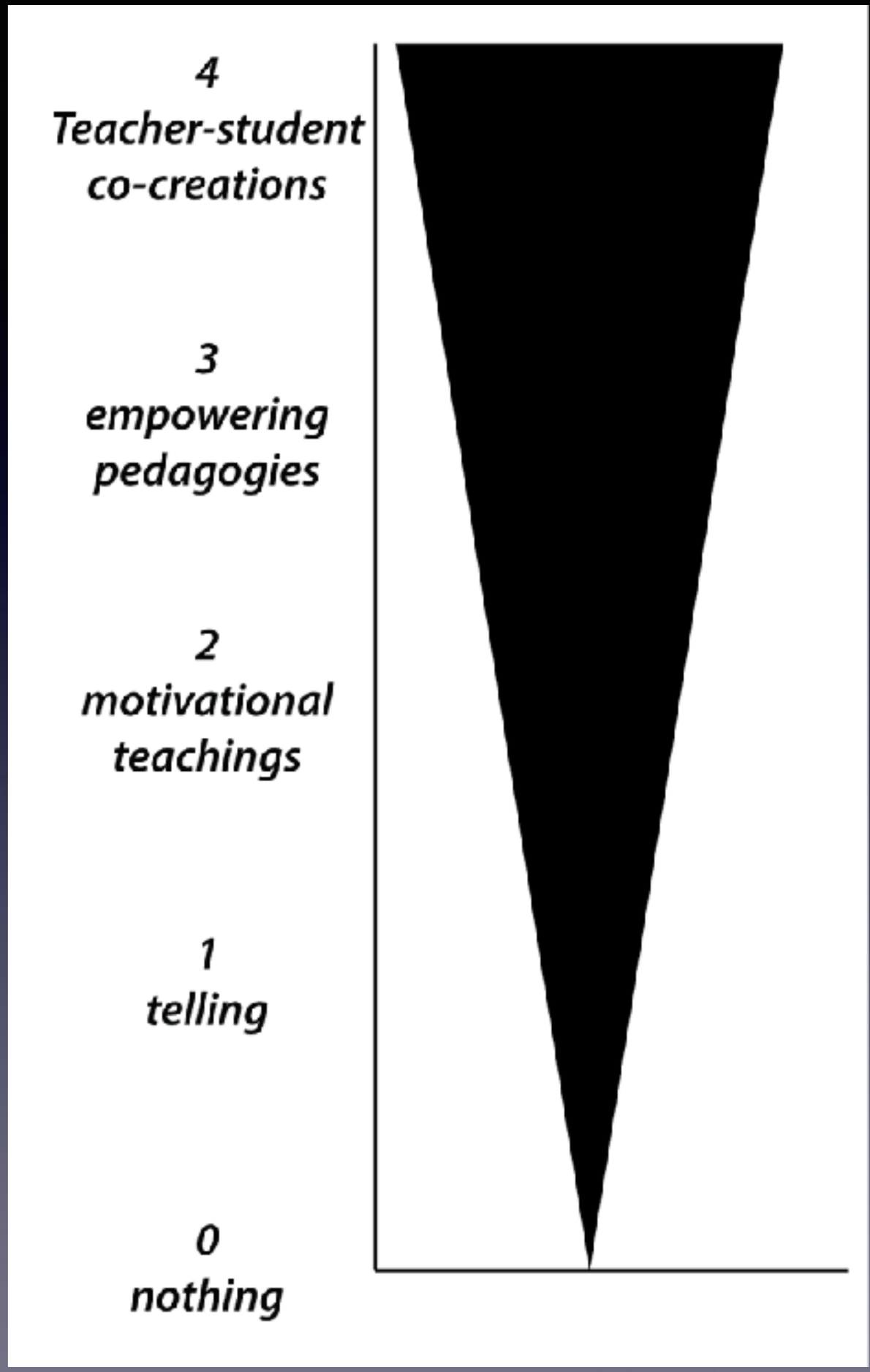


**My final challenge to you:**

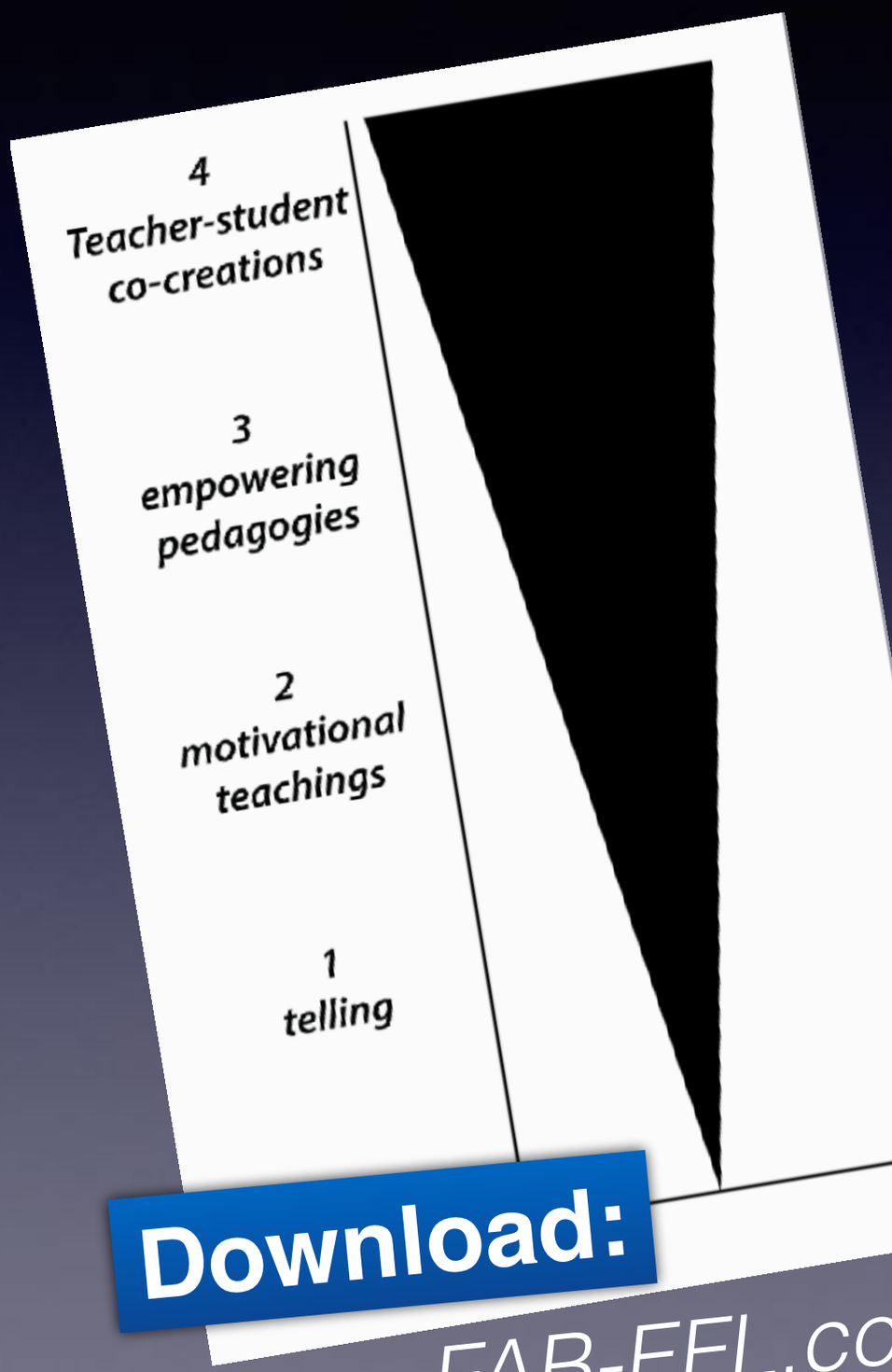
Try to build this into your teaching system!

# Engagement

## Evaluation Chart



# Engagement
## Evaluation Chart




**Download:**

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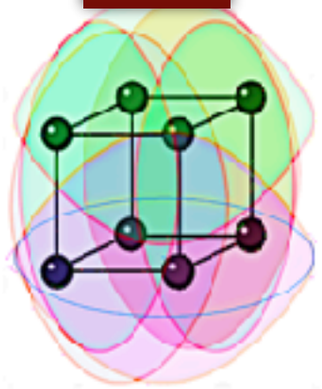
| Coordinate (*y*) | Teaching's Engagement explanation (Rubric) |
|---|---|
| Zero | No activity established toward the set goal. (any movement toward the established goal is completely *left up to chance*) |
| 1 | Singular point or *sets of points* are lectured (told/read) to the student, top-down. The delivery may not be particularly motivational, nor effectively engaging to the student(s). (This may be summed up as "traditional teaching" or "lecturing", but it is not particularly *good* pedagogy because deeper understanding is *left up to chance*, and/or fully left up to the student.) |
| 2 | Motivational teaching strategies are now present in the lesson(s); a pedagogical "bag of tricks" may be developed by the teacher and used to engage students in various ways. (Good teaching and good pedagogical designs begin here. Examples are, but not limited to: rapport building activities; telling jokes; managing to connect music, videos, and games to the learning objectives; etc.) |
| 3 | *Empowering* activities are now present in the lesson(s) – to firmly establish students' feelings of ownership toward the learning goal and the gaining of confidence for autonomous study toward the learning goal. (Students feel the freedom and *confidence* to make significant choices on their way to the learning goal that they now fully 'own'—these highly motivated students are now working at peak levels of engagement. The teacher's role is now significantly more facilitator-like.) |
| 4  | Teacher-student co-creation at the deepest levels of understanding for both the student and the teacher. This level is only possible when both the teacher and the student are working at their peaks toward the goal – with the professional advisement and full engagement of the teacher (co-creating a mutually driven high support context), the student is able to reach higher than their norm. This level of engagement is also a real learning experience for the teacher as they co-create new knowledge on their way to the learning goal together with the student. (The roles of the teacher and student are now blurred, as the deepest levels of understanding [for that particular goal] are achieved only because of mutual participation; the teacher alone, or the student(s) alone could not have attained the same outcome, at this level of excellence.) |

# Neuro-efficient Language Teaching:

## Practical neuroELT techniques for your classroom

**YouTube training:**

*"NeuroELT Maxims"*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