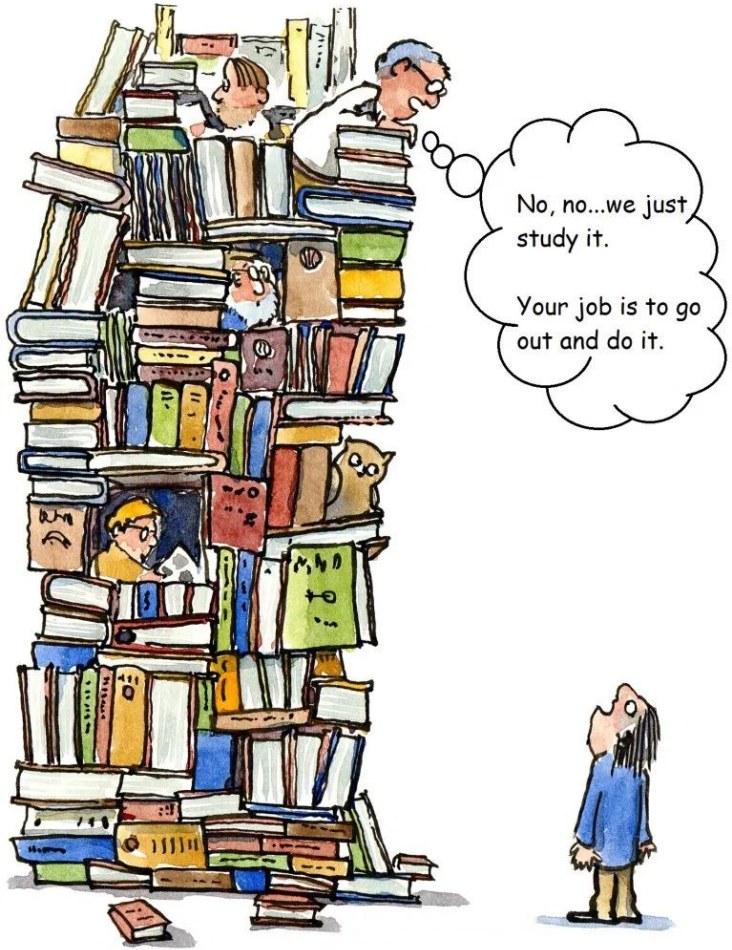


View from the Ivory Tower

Closing the Education Research-Practice Gap

Ella Miesner
emiesner@utexas.edu

PhD Student - Educational Psychology
University of Texas at Austin
Austin ISD Middle School Teacher (on Education Leave)

Today we will....

(1) Provide background and context

(2) Share research findings

  (a) Elephant Training 101: Cognitive Strategies

  (b) Elephant Care 101: Affective Strategies

(3) Discussion: Closing the Research Practice Gap

  (a) Future research topics

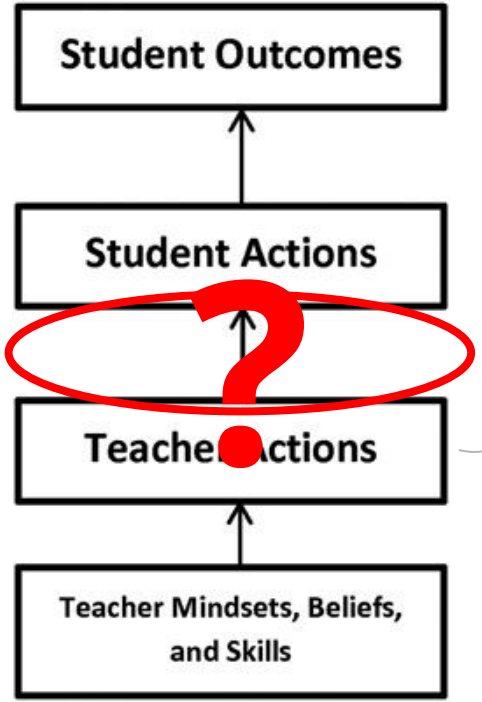
  (b) Crowdsource tools

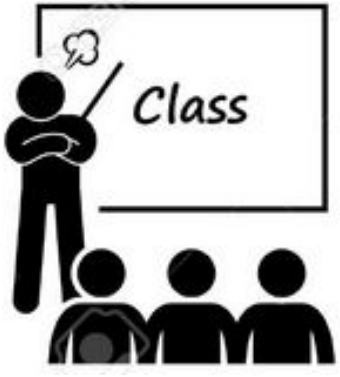
Background: How I got here

Cockrell School of Engineering

PLAN II

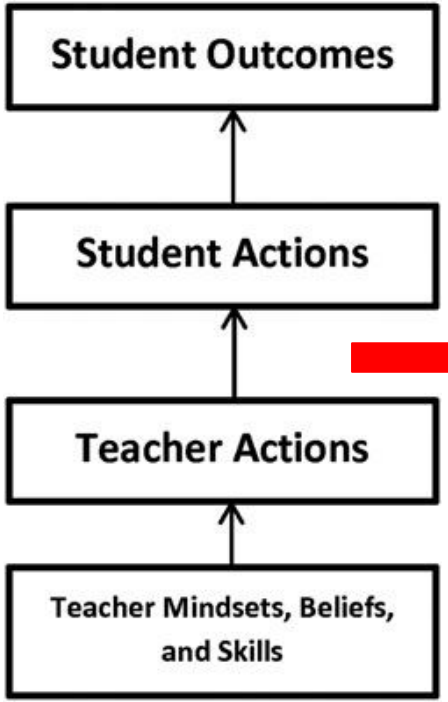
TEACHFORAMERICA HOUSTON

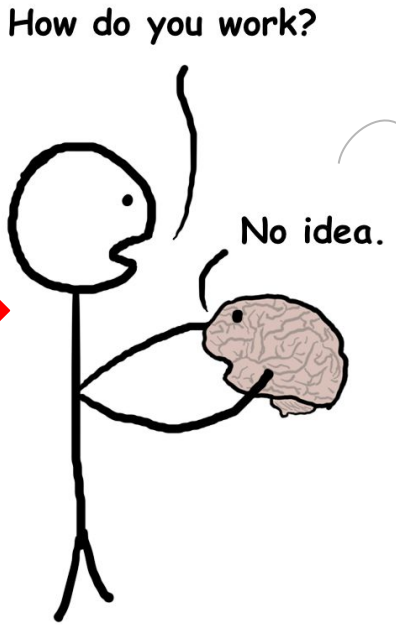




THE UNIVERSITY OF TEXAS AT AUSTIN STEM

Background: How I got here



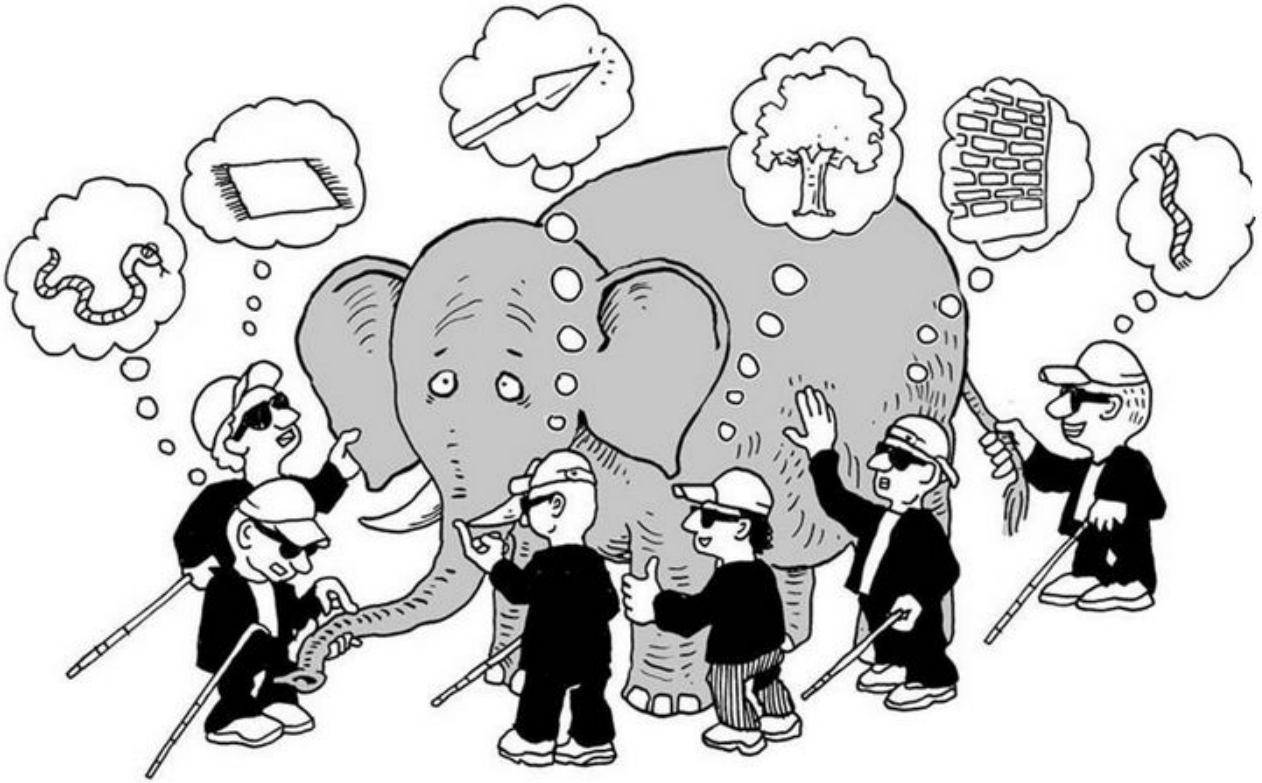


TEXAS Education
The University of Texas at Austin
College of Education

Educational Psychology

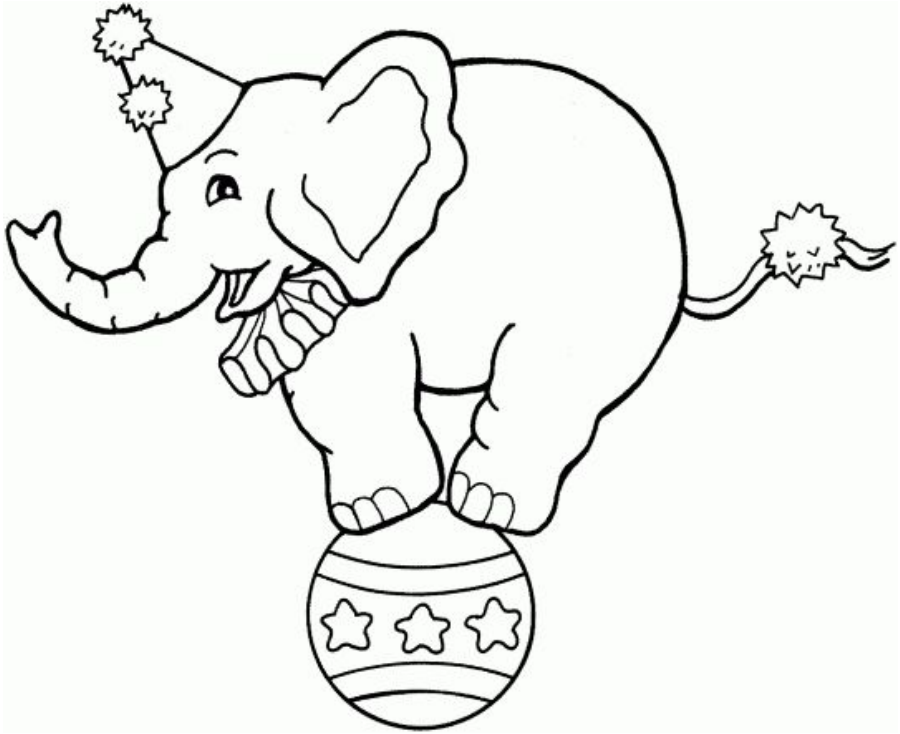
Human Development, Culture, and Learning Sciences

Educational Psychologists

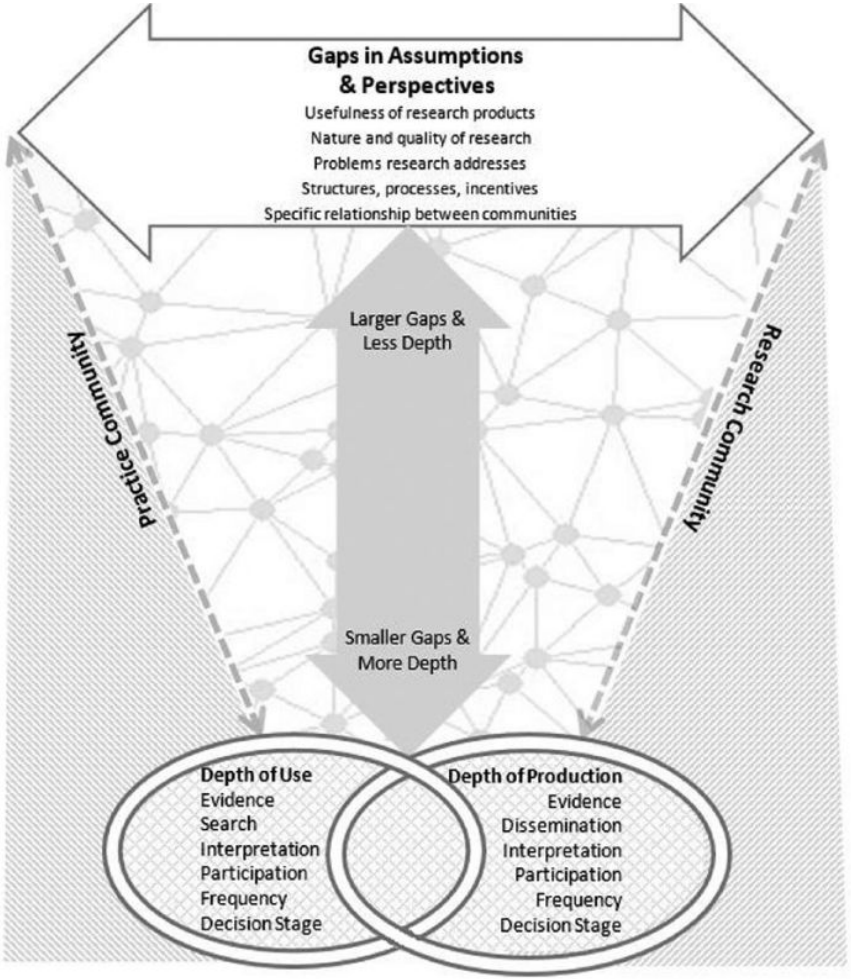


https://eliamdur.com/index.php/2018/09/08/the-blind-men-and-the-elephant/

Classroom Teachers

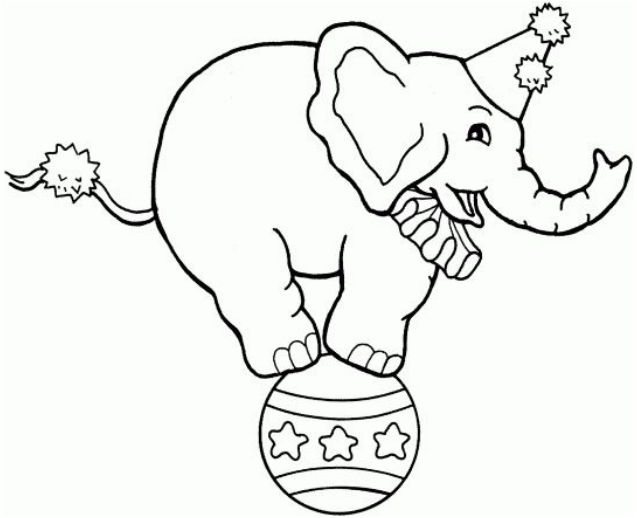


https://eliamdur.com/index.php/2018/09/08/the-blind-men-and-the-elephant/

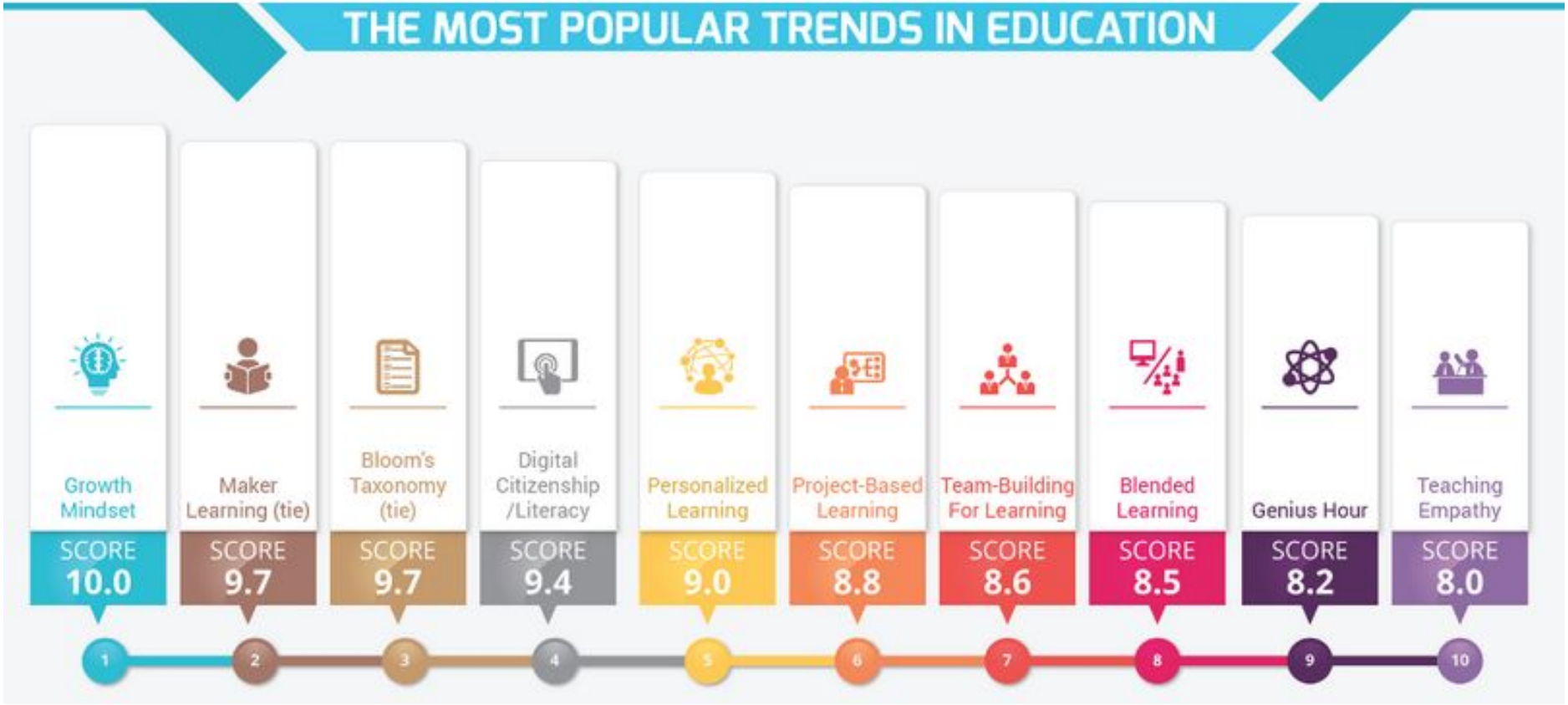


Farley-Ripell et. al. (2018) Rethinking Connections Between Research and Practice in Education: A Conceptual Framework

So what should I do?

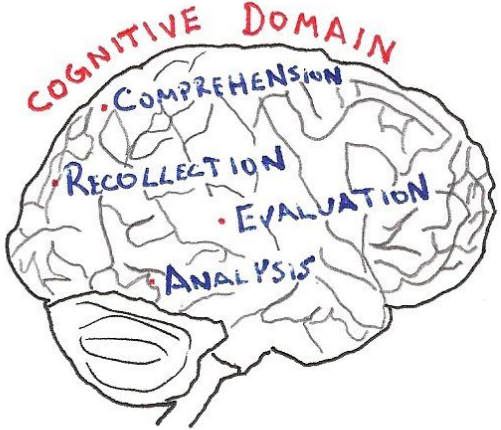


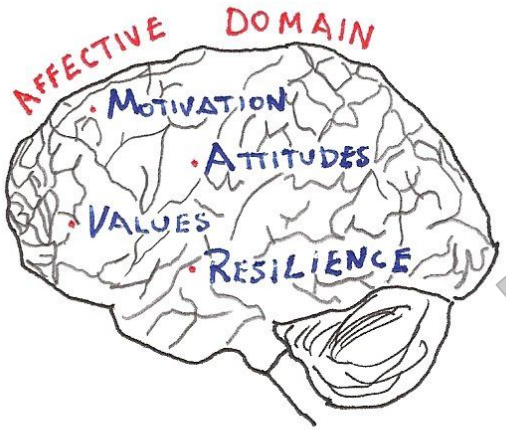
What comes to mind when you think of “research based” teaching strategies?



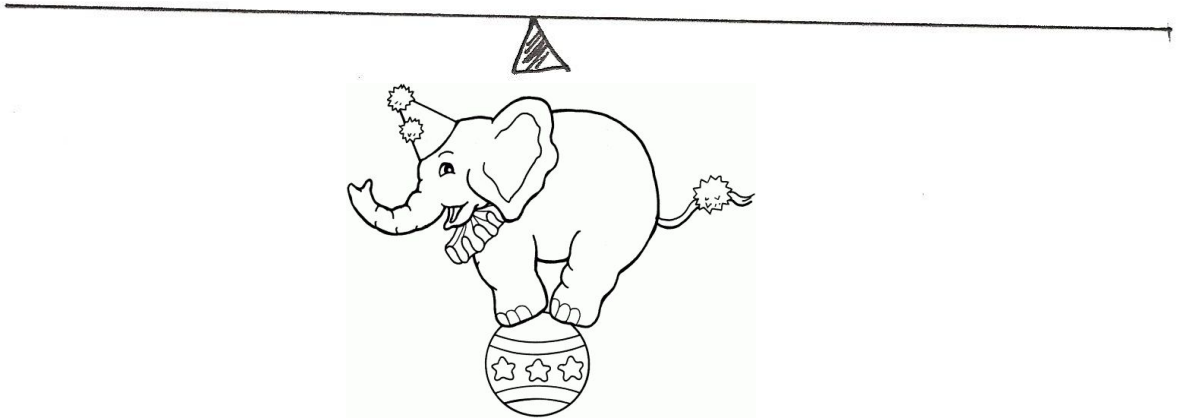
https://www.teachthought.com/the-future-of-learning/most-popular-trends-in-education/

Training your elephants





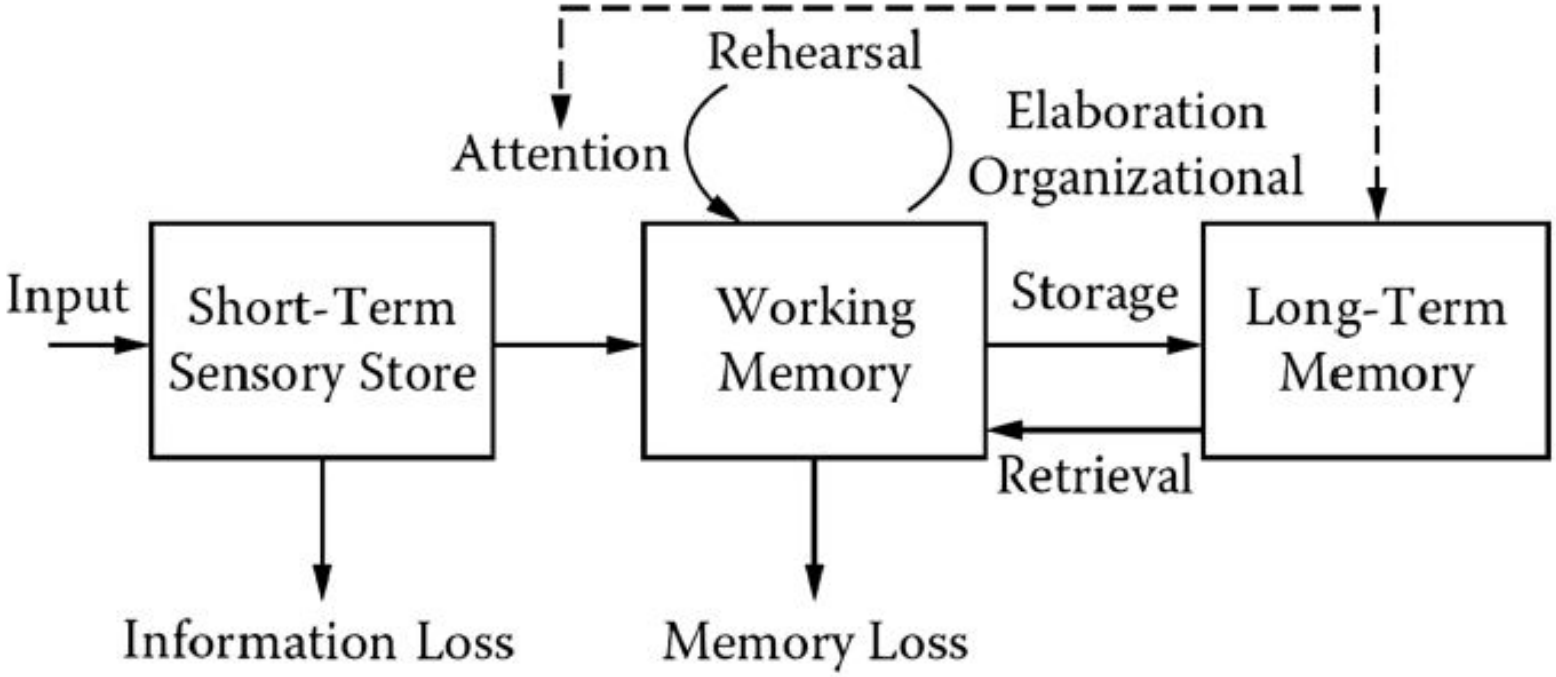
Caring for your elephants



Elephant Training 101 (Cognitive Domain)

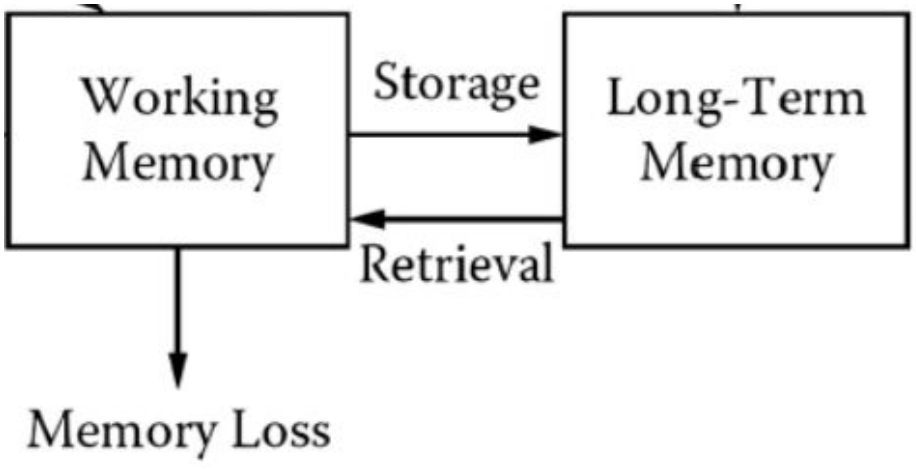
1. Encourage active retrieval
2. Use dual coding *(with care)*
3. Develop metacognition

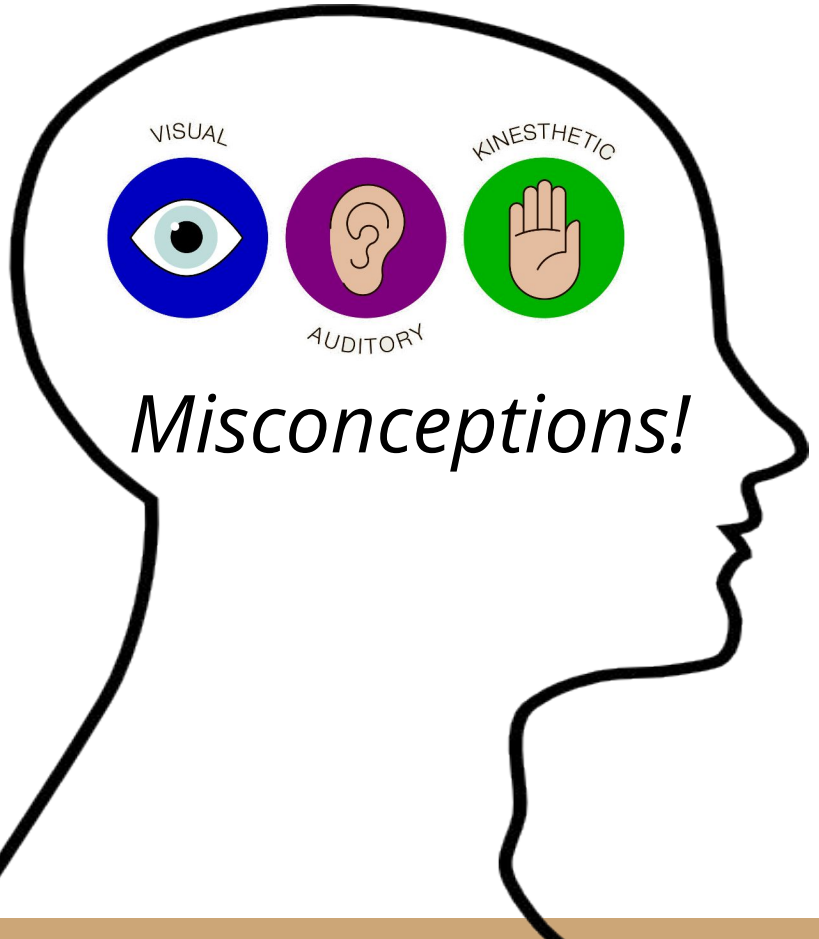
Encourage Active Retrieval



Dembo & Seli, Motivation and Learning Strategies for College Success: A Focus on Self-Regulated Learning (2012)

Encourage Active Retrieval



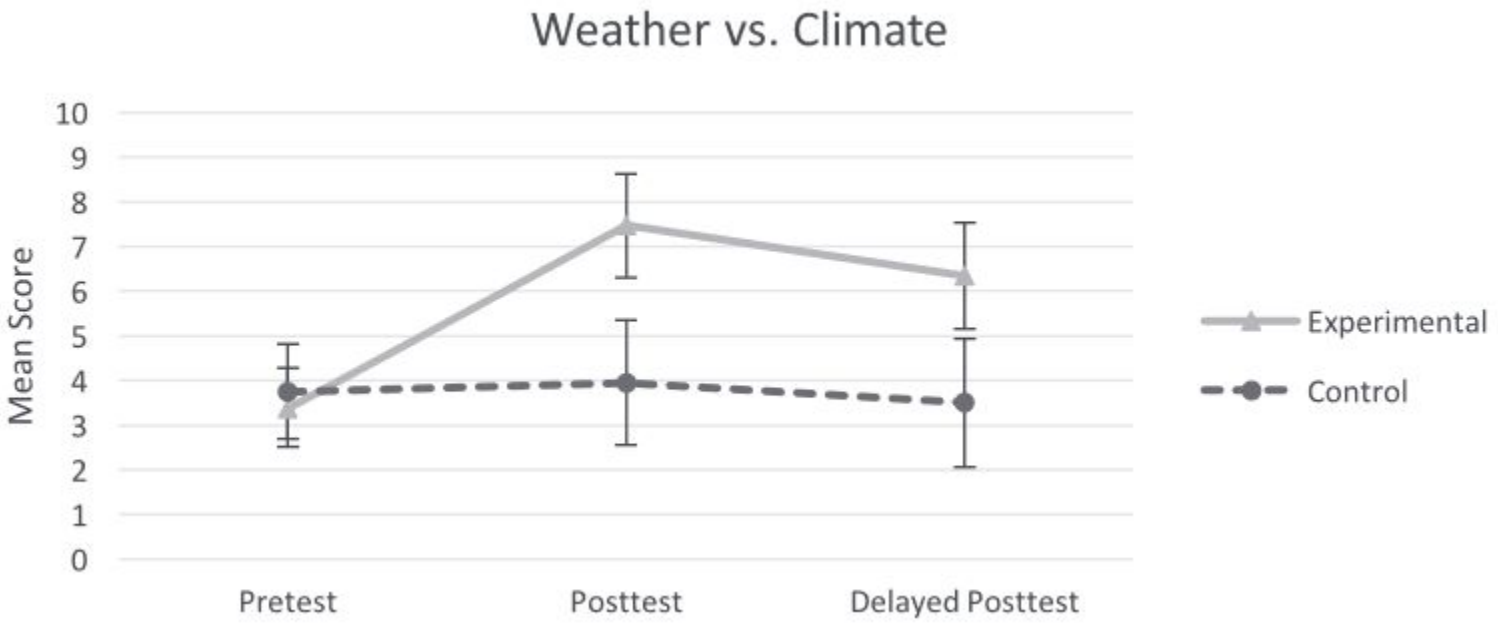


Teacher Tool: Refutation Texts

Incorrect Belief	Many people, including educators, believe learning styles are set at birth and predict both academic and career success....
Refutation	even though there is no scientific evidence to support this common myth, according to new research published by the American Psychological Association.
Correct Understanding	Though teachers and students have preferences regarding instructional style, studies have found no benefit in to “learning styles” for increasing student achievement.

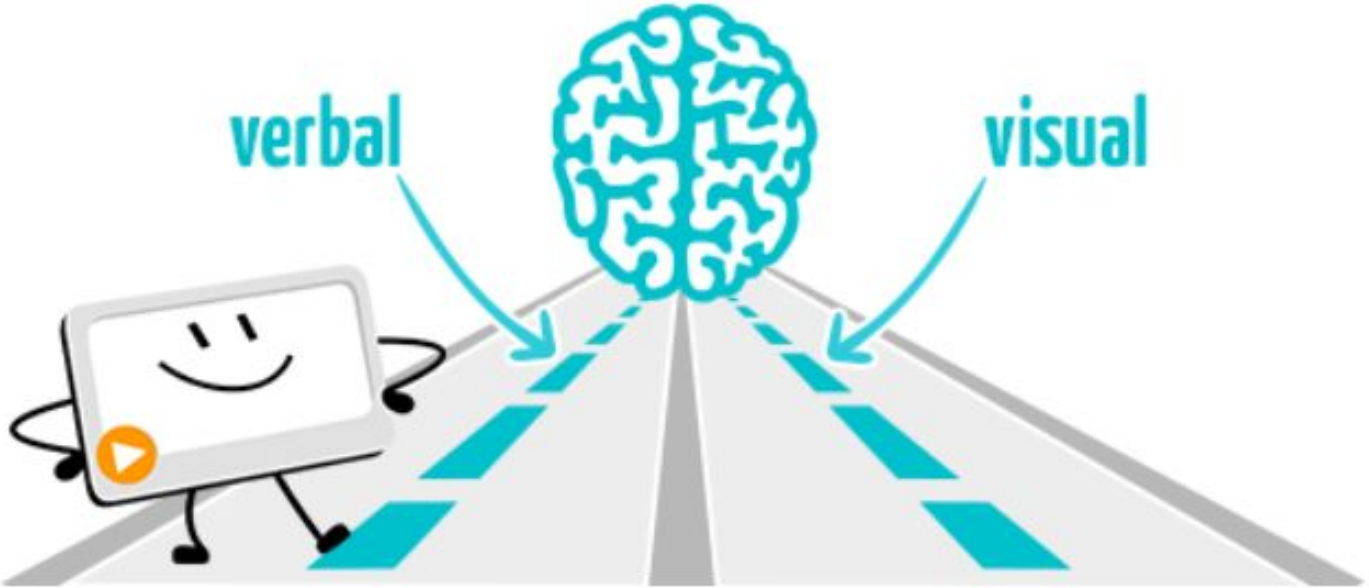
Beker et. al. (2019) Refutation texts enhance spontaneous transfer of knowledge
Nancekivell et al. (2019) Maybe They’re Born With It, or Maybe It’s Experience:Toward a Deeper Understanding of the Learning Style Myth

Teacher Tool: Refutation Texts



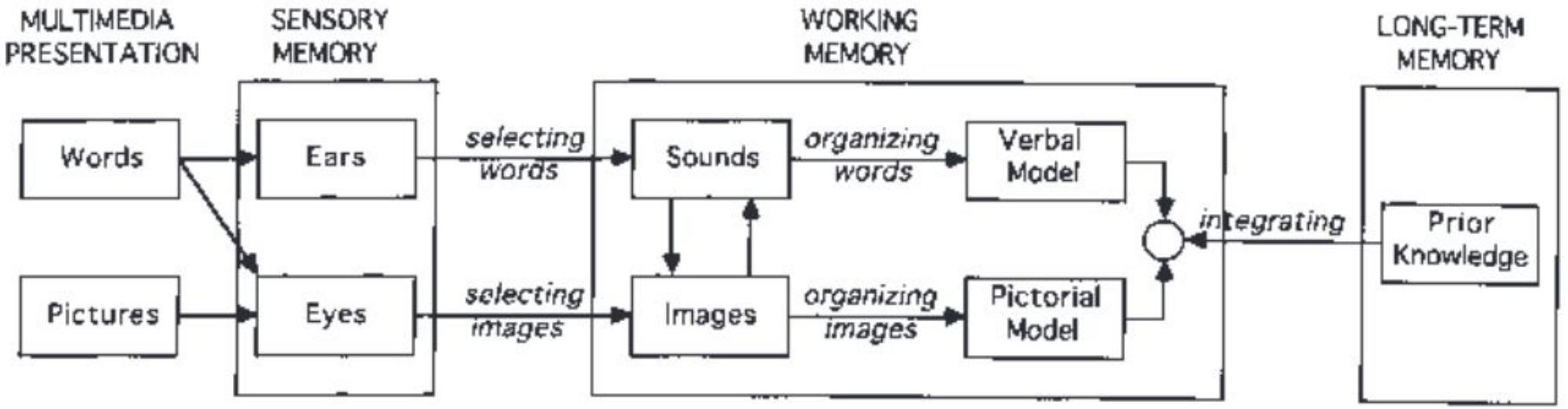
Nussbaum et. al. (2017) Refutation texts effective for climate education. https://files.eric.ed.gov/fulltext/EJ1135295.pdf

Use Dual Coding



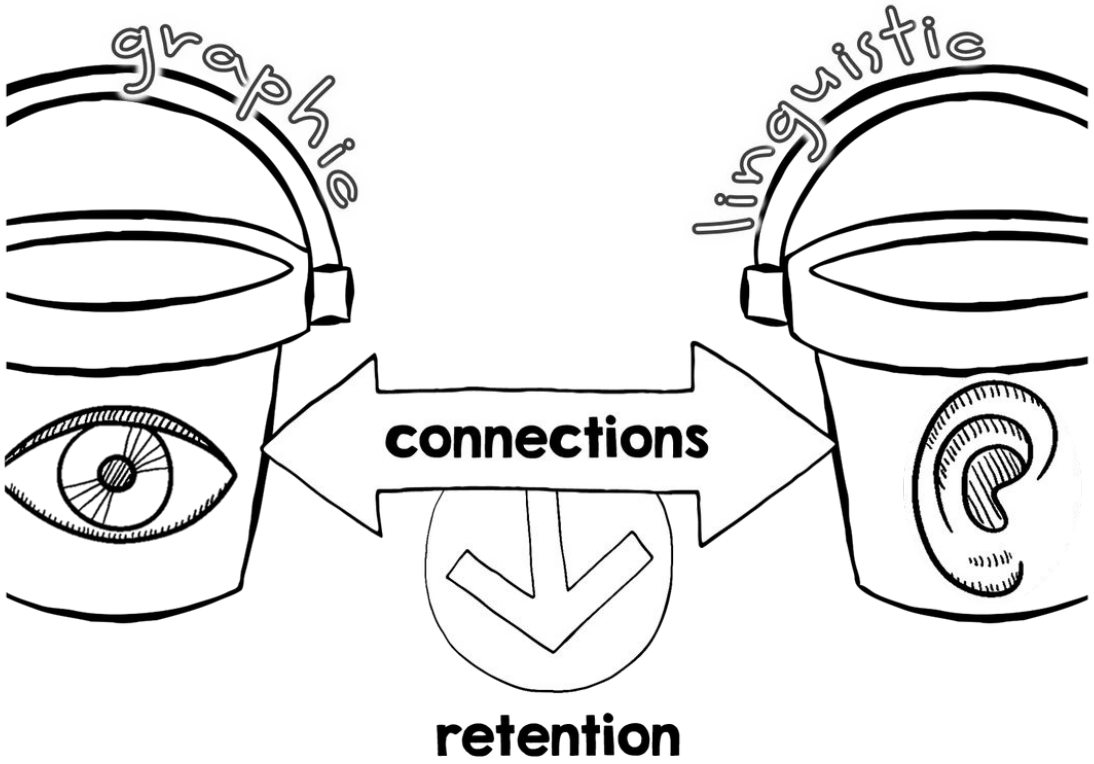
Cuevas, J. (2016) An analysis of current evidence supporting two alternate learning models: learning styles and dual coding

Use Dual Coding



Mayer & Moreno (2003) Nine Ways to Reduce Cognitive Load in Multimedia Learning. *Educational Psychologist*

Teacher Tools: Doodling



Teacher Tools: Doodling

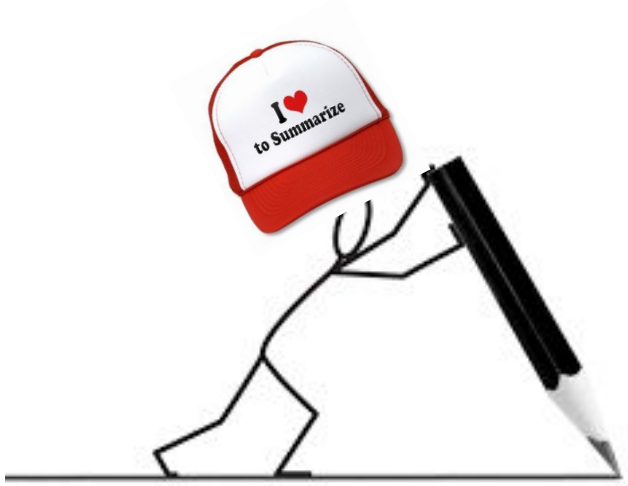
Table 2
Mean Conceptual and Seductive Recall as a Function of Text and Activity Condition for Experiment 1

	Base-only			Base-plus-seductive		
Recall	Sketch	Summary	Think	Sketch	Summary	Think
Conceptual recall	4.28 (2.97)	3.83 (1.86)	4.68 (2.38)	3.21 (1.96)	3.59 (1.44)	3.21 (2.51)
Seductive recall	—	—	—	.47 (.84)	1.00 (1.23)	1.95 (1.43)

Note. Standard deviations are presented in parentheses. There are no values for seductive recall in the base-text condition because these participants were not exposed to seductive text.

Jager et. al. (2018) Sketching and Summarizing to Reduce Memory for Seductive Details in Science Text. *Journal of Educational Psychology*

Teacher Tools: Doodling

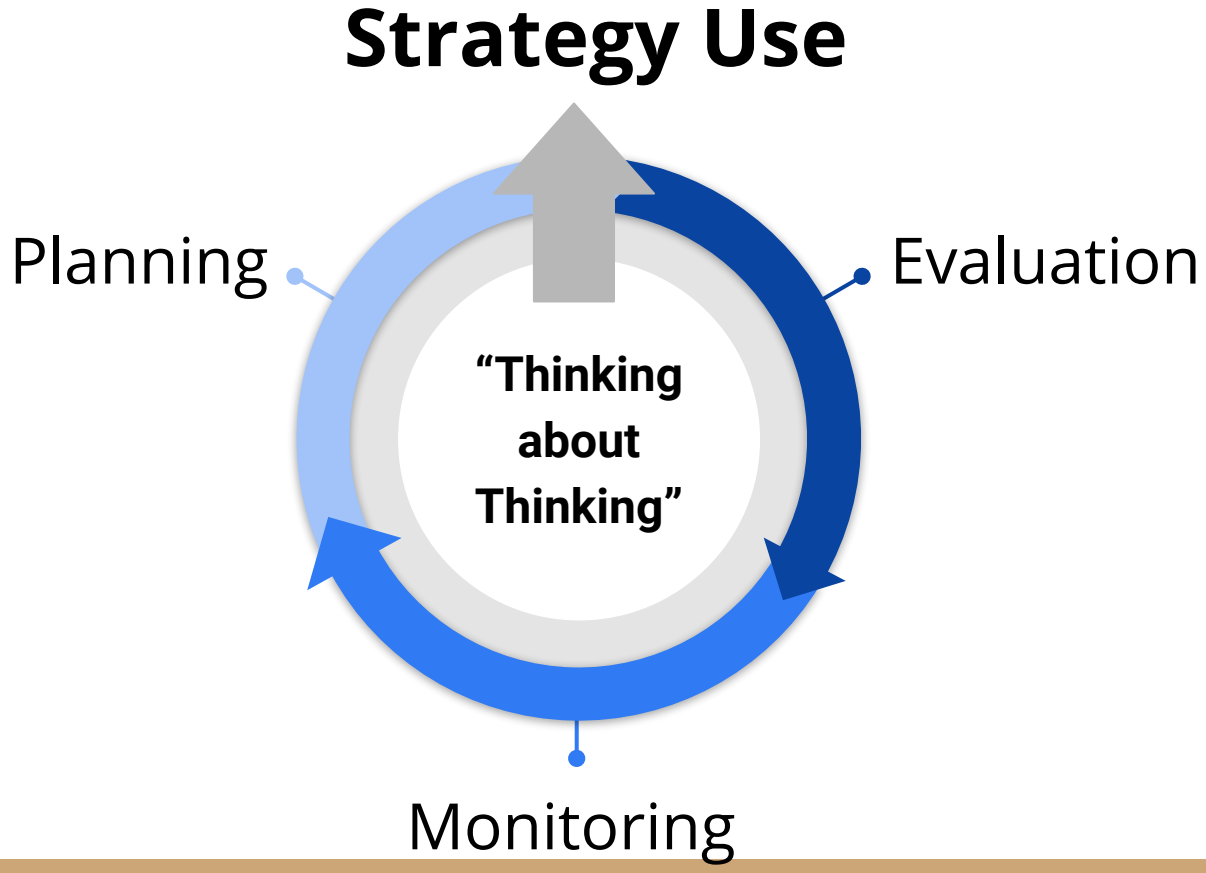


Teacher tool: *Doodling (and Summarizing)*

Teacher tool: *Interleaving*

Jager et. al. (2018) Sketching and Summarizing to Reduce Memory for Seductive Details in Science Text. *Journal of Educational Psychology*

Develop Metacognition



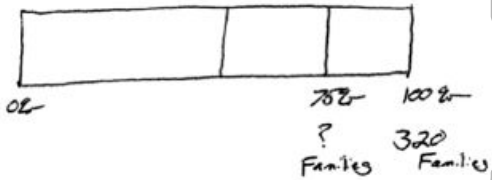
Develop Metacognition

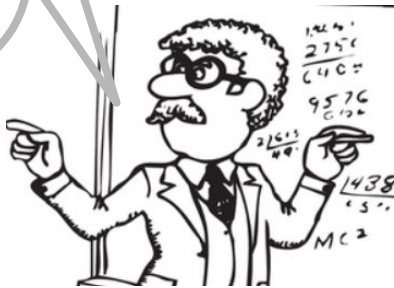
But is there an easier way? Looking at the diagram I took half and then half again to find my 75%.

I could do that same thing with the families. Dividing by two is easier than multiplying by big and unknown numbers. Well I would need to take all of the families and divide by two (320½ = X) and then divide that answer by two again (X½ = Y) and then add the second answer to the first (X+Y= ? families that attended).

… hmm I could also subtract that Y from the 320 and get the same answer (320-Y = ? families that attended) because it is 25%.

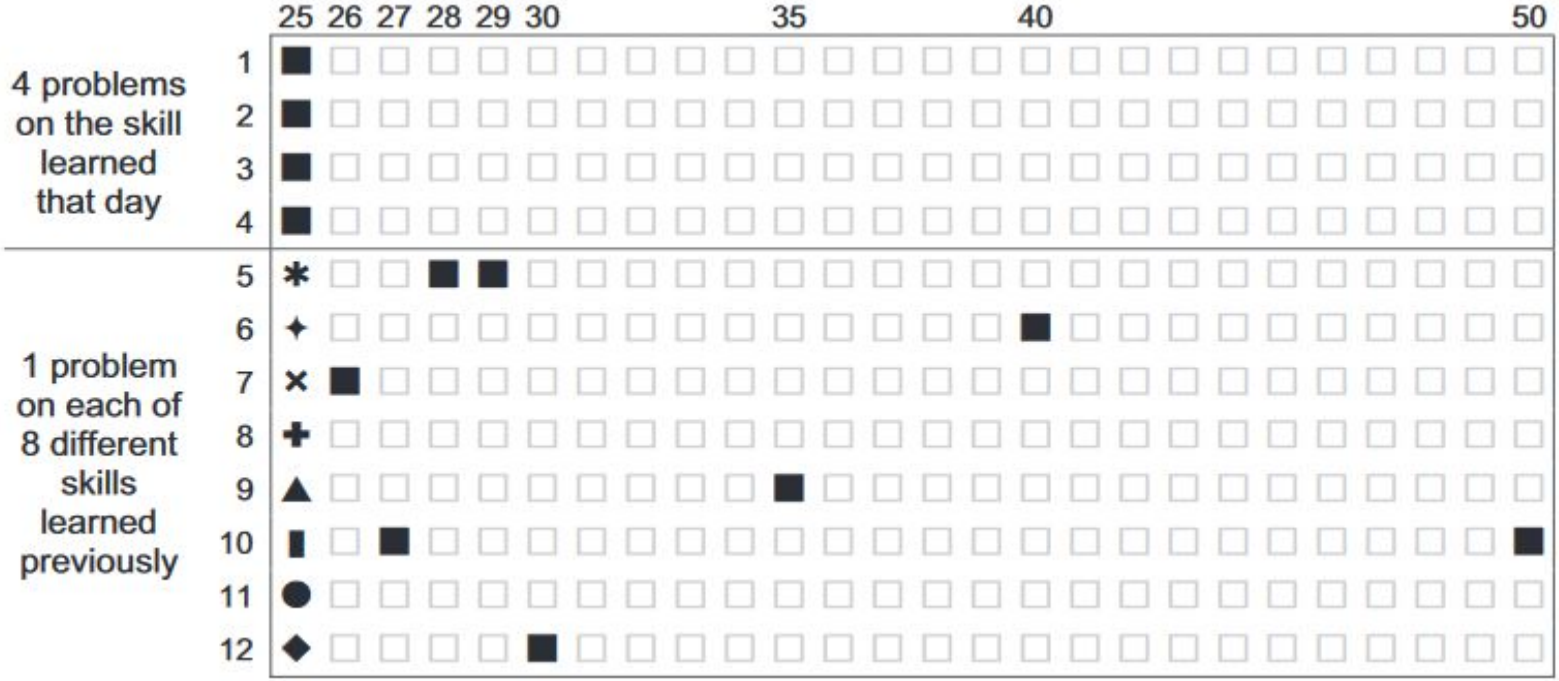
That can work, but I need to <u>evaluate</u> my plan…. Let's see … I have my total families, which I cut in half and have 50% (points to the first half of the diagram) and then cut in half again (points to the second half of the diagram) to get 25%, which I need to add to the 50% to find my 75%. Yep I have all of my facts and it matches the diagram and the problem, so I am good to go.





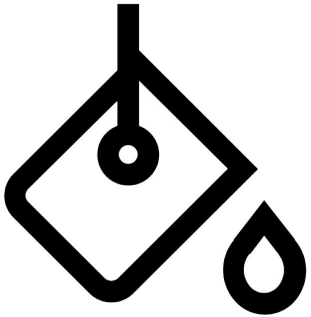
Teacher Modeling

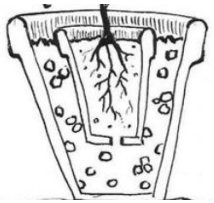
Teacher Tool: Interleaving



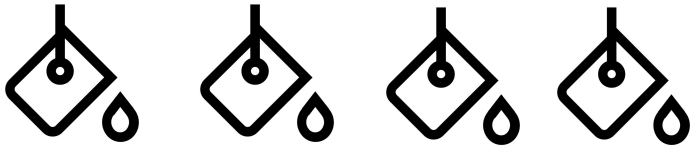
Roher et. al. (2016) Interleaved Practice Improves Mathematics Learning. *Computer Science: Psychology*

Teacher Tool: Interleaving



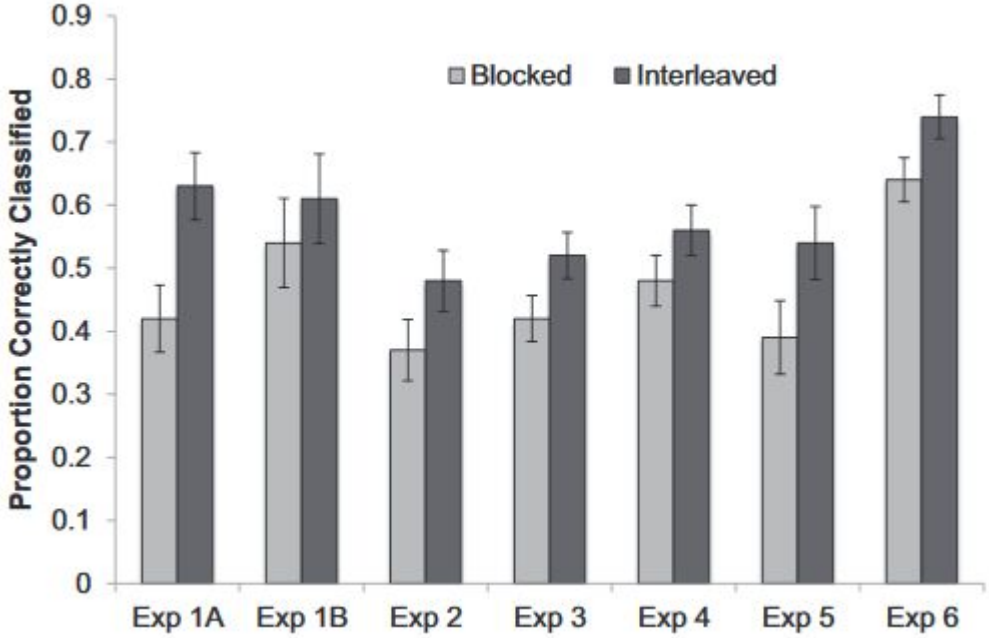


Traditional Instruction



Interleaving

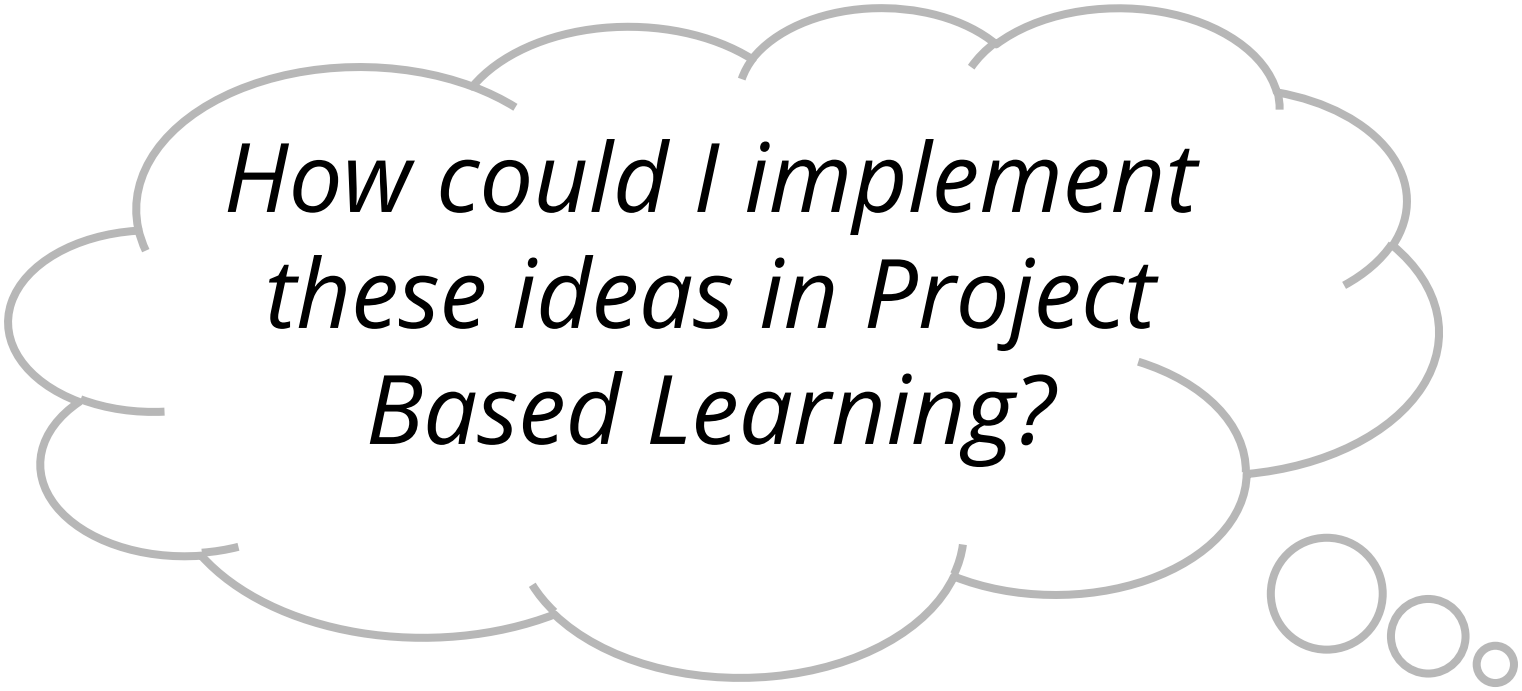
Teacher Tool: Interleaving



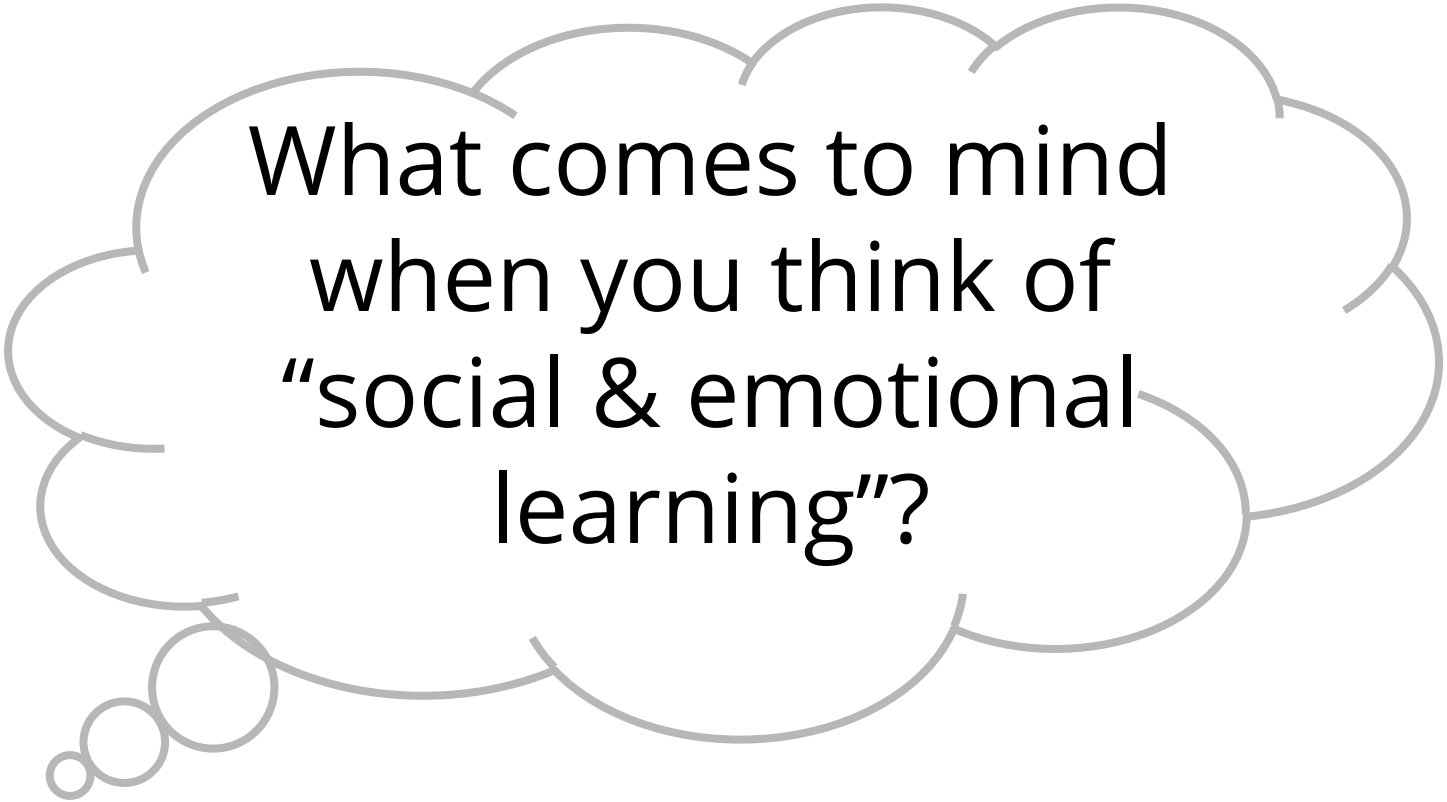
Yan et. al. (2016) On the Difficulty of Mending Metacognitive Illusions: A Priori Theories,Fluency Effects, and Misattributions of the Interleaving Benefit

https://bjorklab.psych.ucla.edu/wp-content/uploads/sites/13/2016/11/YanBjorkBjork2016.pdf

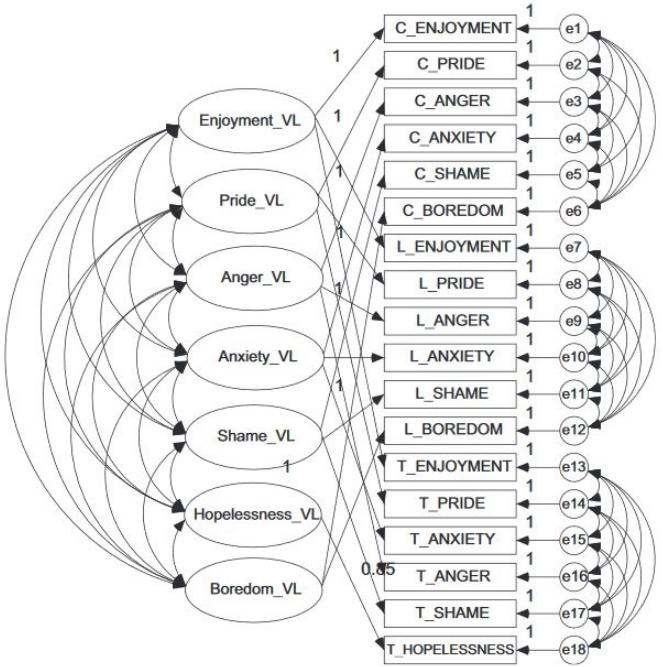
Elephants Training 101 Recap



Elephants Care 101 (Affective Domain)



Achievement Emotions

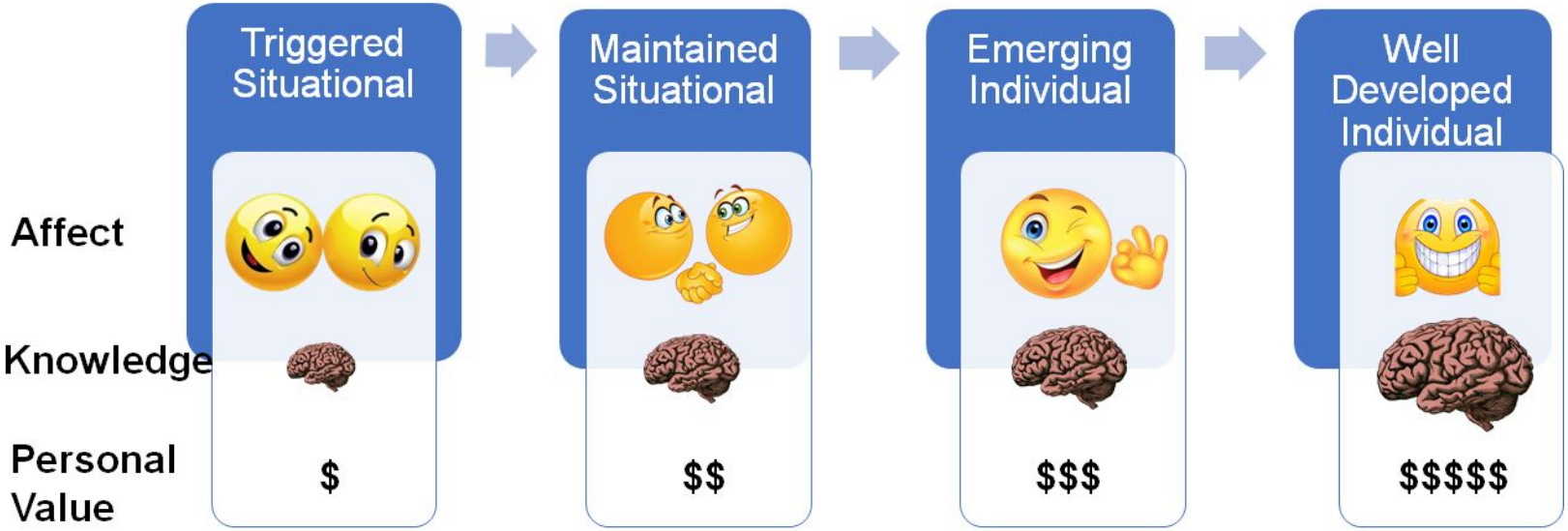


Starkley-Perret et. al. (2018) Measuring the impact of teaching approaches on achievement-related emotions: The use of the Achievement Emotions Questionnaire. *British Journal of Educational Psychology*

Elephant Care 101 (Affective Domain)

1. “Trigger” and Nurture Interest
2. Acknowledge and Explore Identity
3. Build Caring Relationships

Hook and Nurture Interest

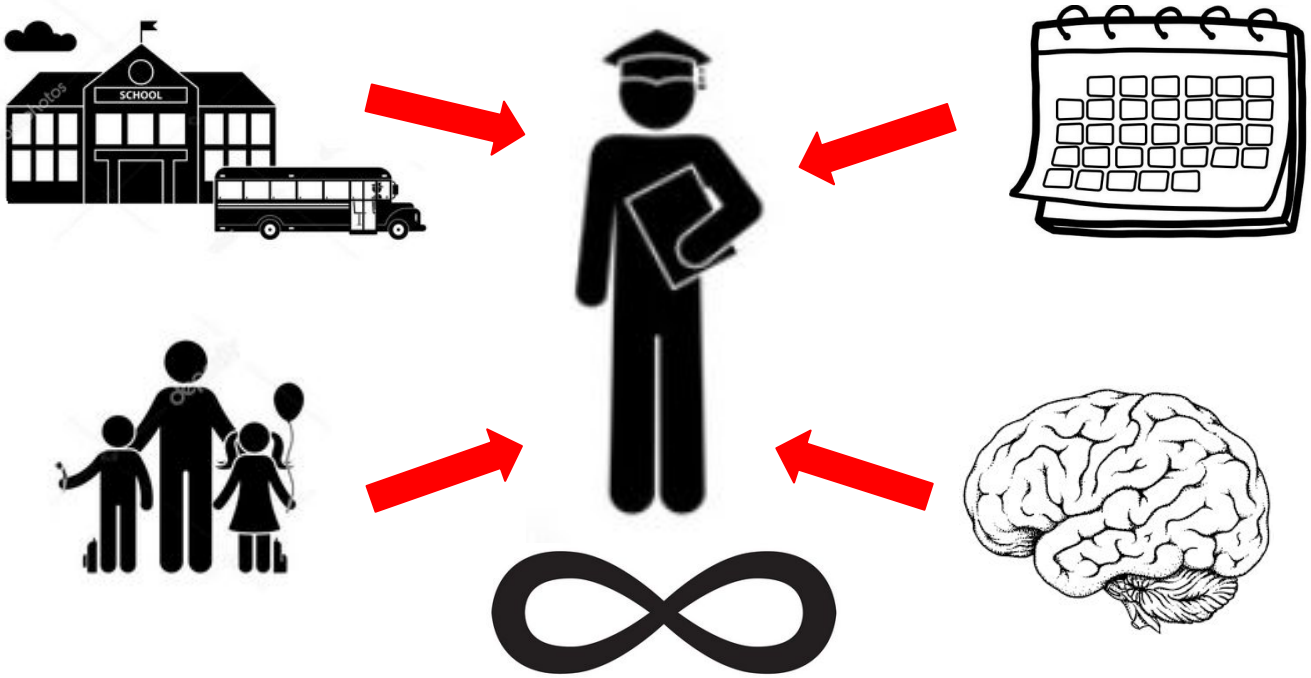


Hidi & Renninger (2010) The Four-Phase Model of Interest Development. *Educational Psychologist*.

Acknowledge and Explore Identity

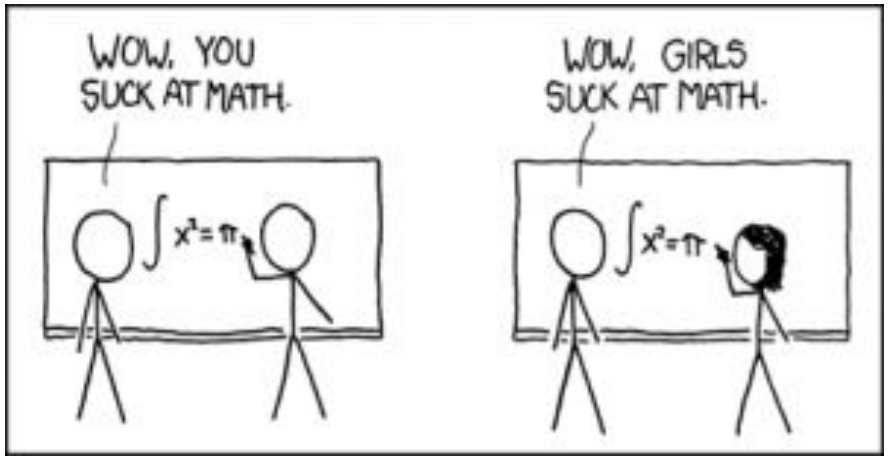
What five NOUNS would you use to fill in this box?

Acknowledge and Explore Identity



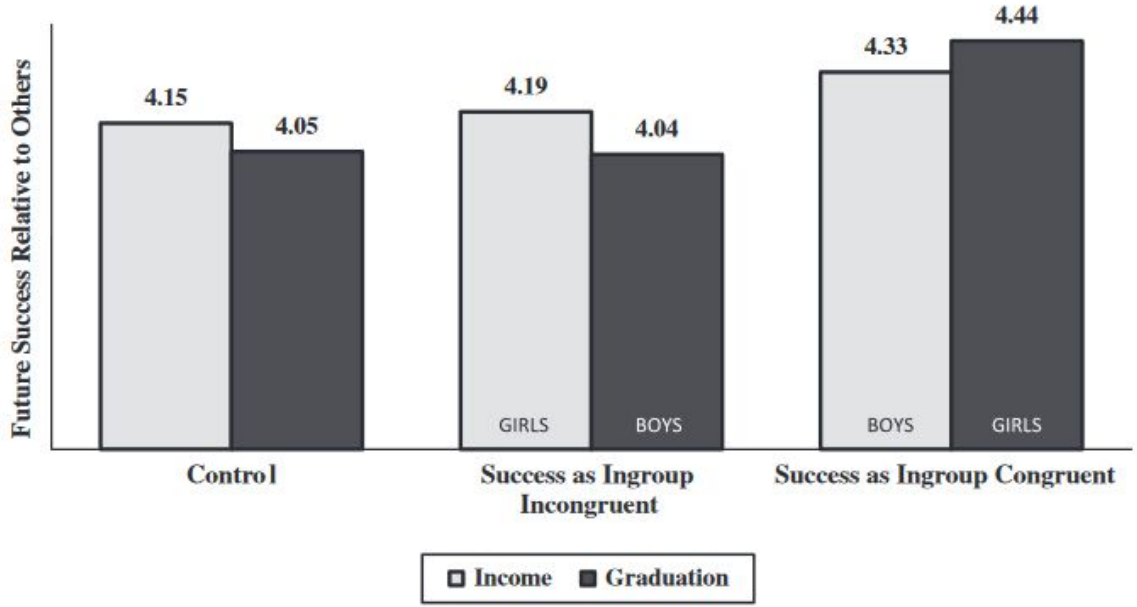
(McLean et. al, 2017)

Acknowledge and Explore Identity



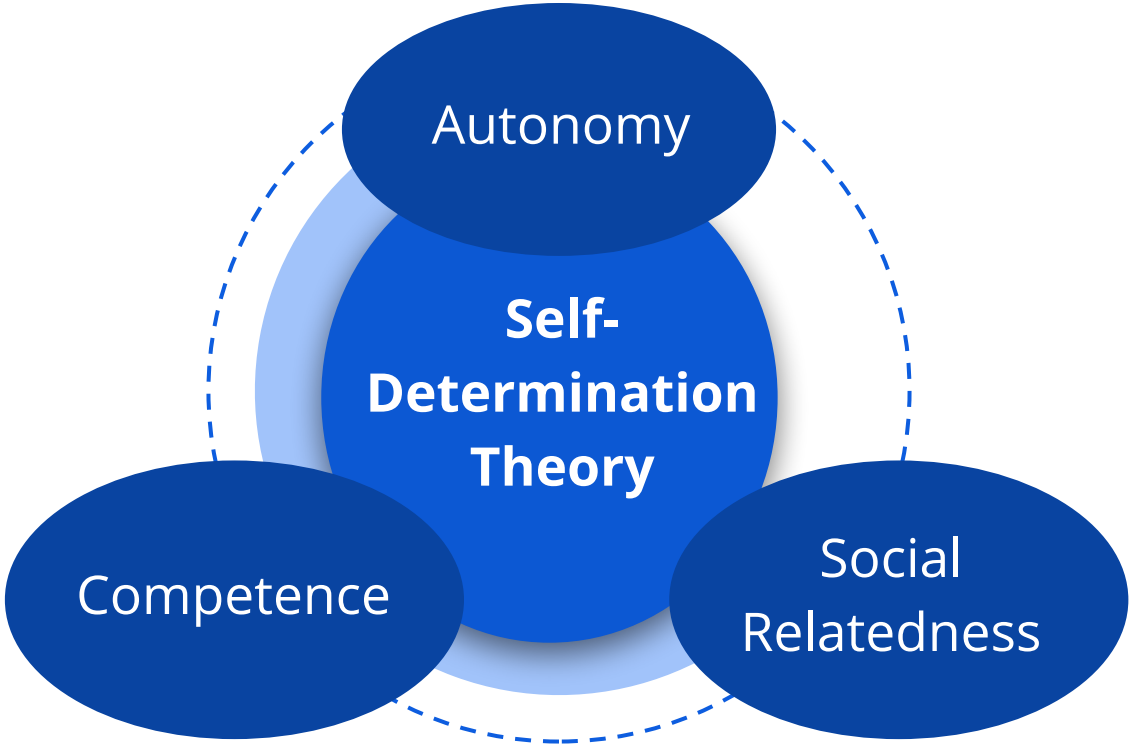
- Context clues matter
- Refute stereotypes
- Promote growth mindset
- Provide role models

Acknowledge and Explore Identity



Elmore and Oyserman (2012) “If ‘we’ can succeed, ‘I’ can too: Identity-based motivation and gender in the classroom.” *Contemporary Educational Psychology.*

Build Caring Relationships



Ryan, R. M., Deci, E. L. (2000) Self-determination theory: Basic psychological needs in motivation, development, and wellness. New York: Guilford Publishing

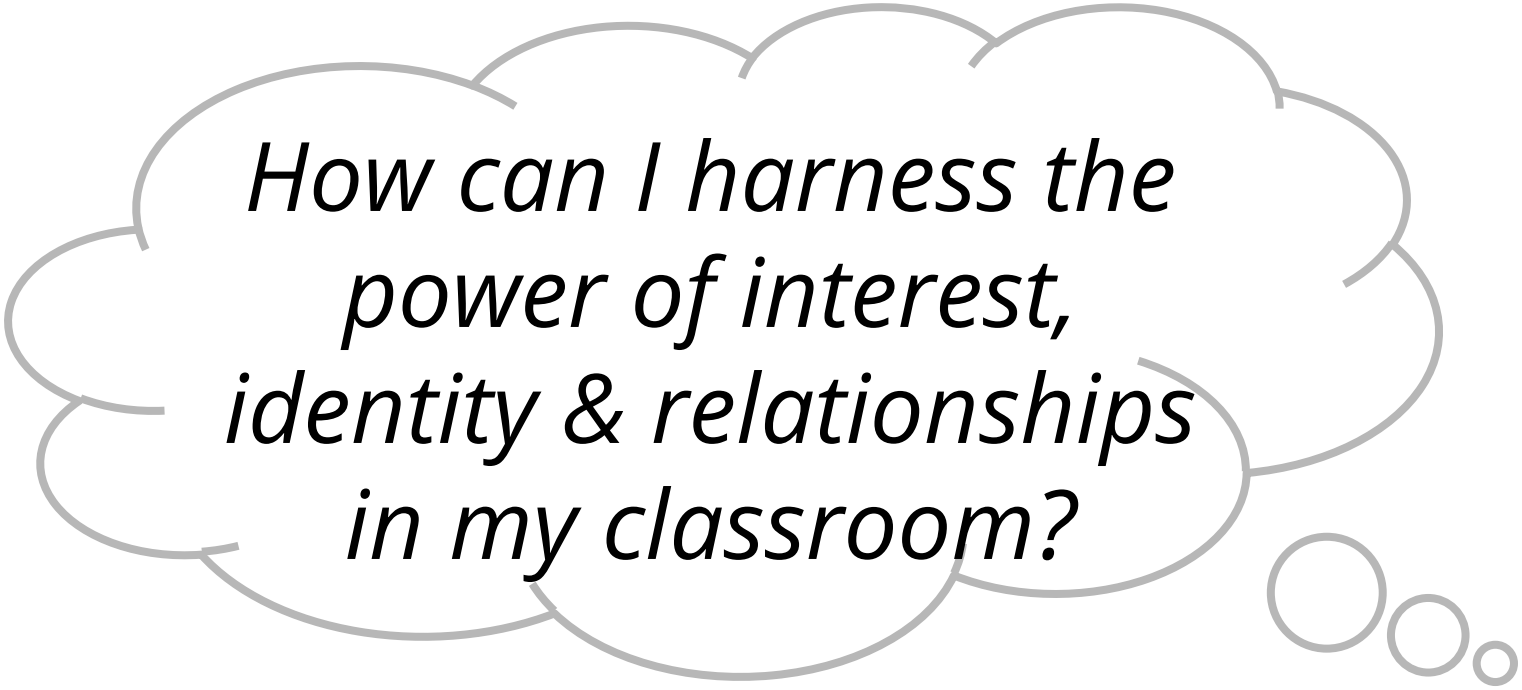
Build Caring Relationships

"...the teacher has a more important function than to say right or wrong.... there is more important work to be done – in which the teacher's relations to the pupil cannot be duplicated by a mechanical device. Instrumental help would merely improve these relations"

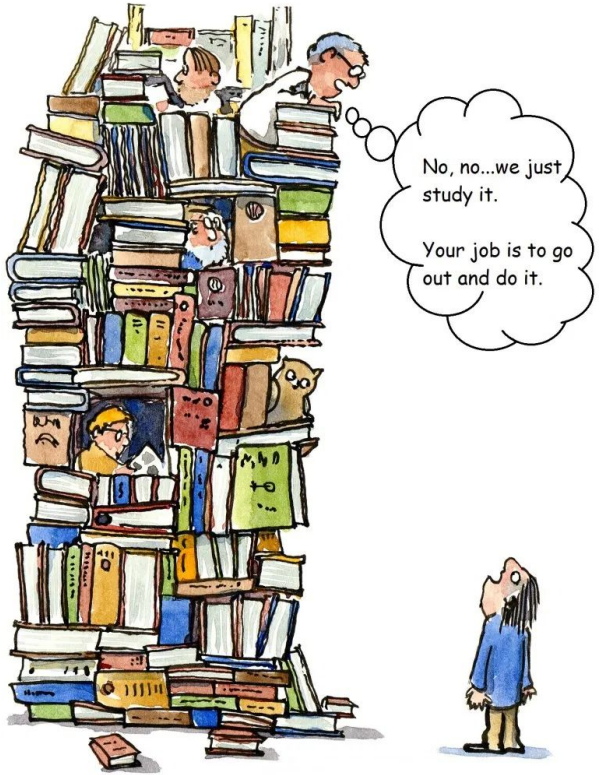
- B.F. Skinner (1954, pg. 96)

Froiland, Worrell & Oh (2019) "Teacher–student relationships, psychological need satisfaction, and happiness among diverse students" *Psychological Science*

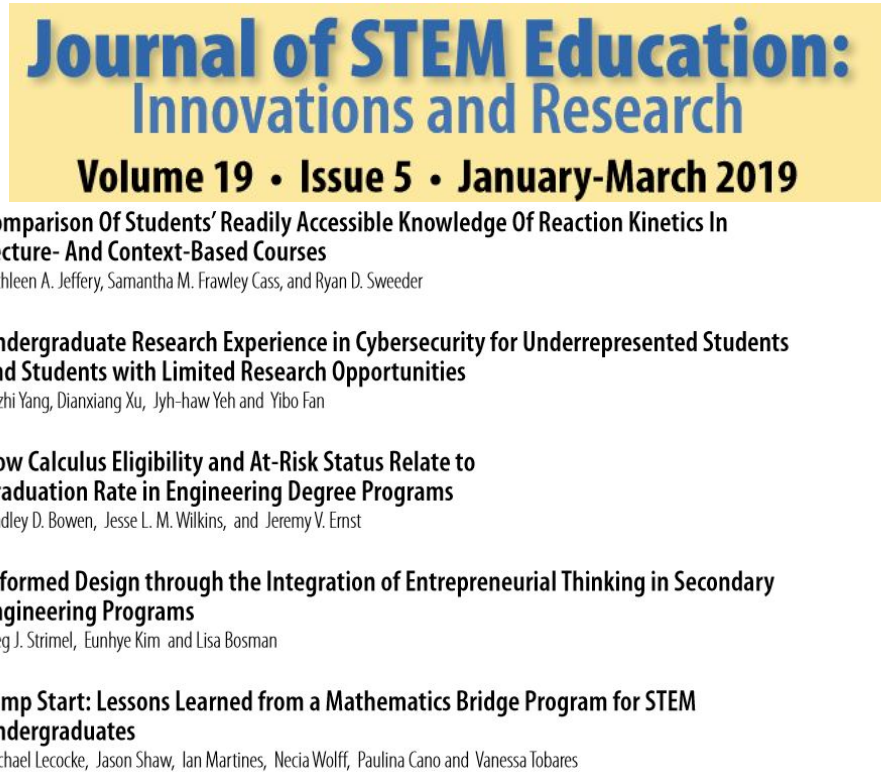
Elephant Care 101 Recap



Discussion: Research Practice Gap



Discussion: Research Practice Gap



Journal of STEM Education: Innovations and Research

Volume 19 • Issue 5 • January-March 2019

Comparison Of Students' Readily Accessible Knowledge Of Reaction Kinetics In Lecture- And Context-Based Courses 5
Kathleen A. Jeffery, Samantha M. Frawley Cass, and Ryan D. Sweeder

Undergraduate Research Experience in Cybersecurity for Underrepresented Students and Students with Limited Research Opportunities 14
Dazhi Yang, Dianxiang Xu, Jyh-haw Yeh and Yibo Fan

How Calculus Eligibility and At-Risk Status Relate to Graduation Rate in Engineering Degree Programs 26
Bradley D. Bowen, Jesse L. M. Wilkins, and Jeremy V. Ernst

Informed Design through the Integration of Entrepreneurial Thinking in Secondary Engineering Programs 32
Greg J. Strimel, Eunhye Kim and Lisa Bosman

Jump Start: Lessons Learned from a Mathematics Bridge Program for STEM Undergraduates 40
Michael Lecocke, Jason Shaw, Ian Martines, Necia Wolff, Paulina Cano and Vanessa Tobares

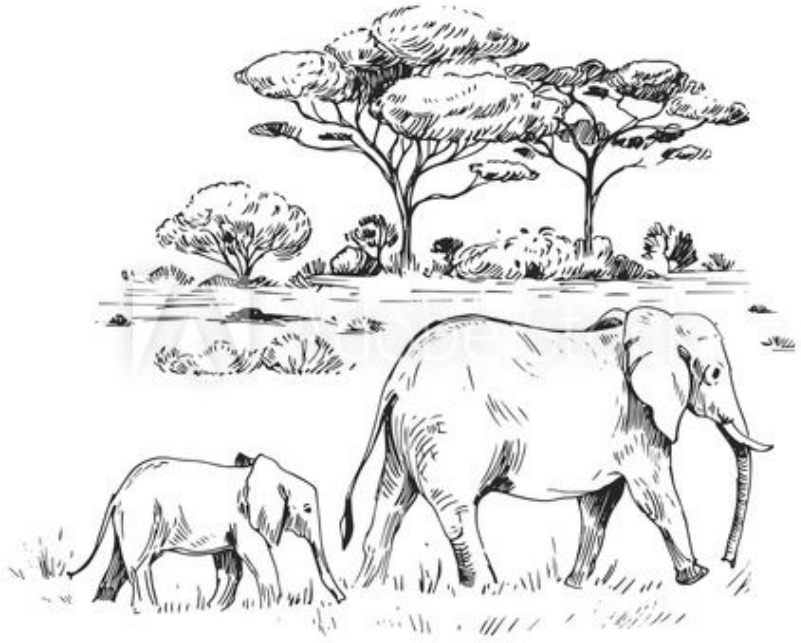
Discussion: Research Practice Gap

What questions do you have that research needs to be addressing?

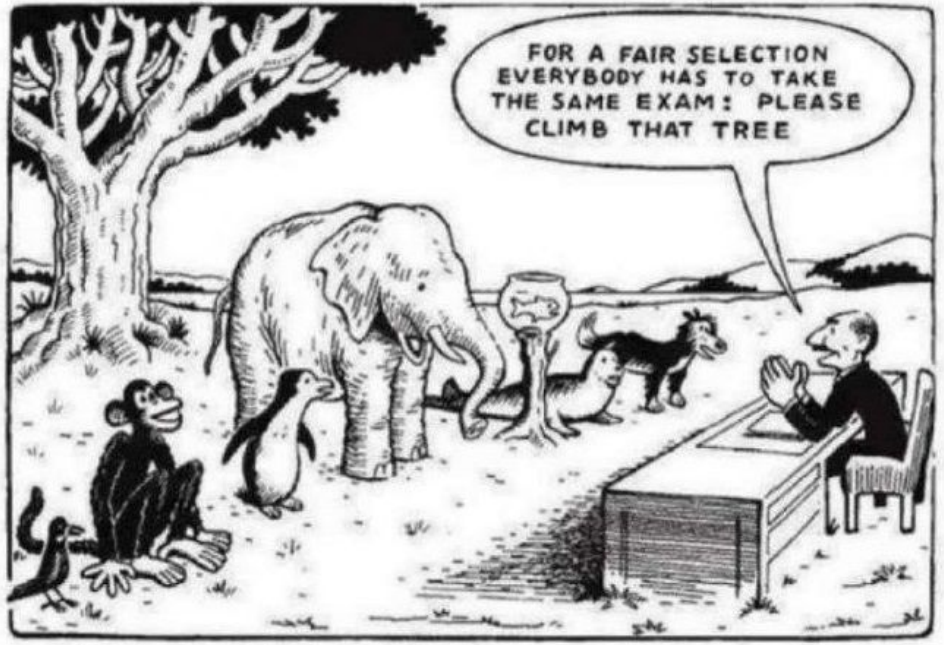
(i.e. what are the blind spots in academia)

What tools and resources do you currently use to find up to date research?

Take Away Messages



It's Complicated.



It Depends.

Your Questions?

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In this session we will look at some recent research related to student engagement, social and emotional learning, and STEM education. We will discuss ways to balance work in the classroom with continual professional and personal growth including accessing resources, both scholarly and informal. Participants will leave the session with a bank of research based strategies to use immediately in the classroom as well as the tools needed to continue to build their professional practice.

Affective Domain

"Trigger" and Nurture Interest

Acknowledge and Explore Identity

Build Caring Relationships

Recommended Resources for Accessing Relevant Research

(1) What Works Clearing House Practice Guides
- *Organized by topic with clear indicators of research-based effectiveness evaluation*

(2) Harvard Educational Review
- *More of a "big picture" view on current issues in education, with a focus on social and cultural issues*

(3) Education Endowment Foundation Teaching and Learning Toolkit
- *Specifically for ages 5 – 16; divided by topic and includes description, evaluation, and implementation points to consider (not updated frequently)*

(4) Edutopia.org
- *An easy to read and informal guide to current trends in education; mostly blog posts and links out to sources*

And someday in the future my website will be more up to date with research….www.sciencesmiles.com 😊

Peer recommended resources:

Further Questions? Contact Ella: emiesner@utexas.edu

Cognitive Domain

Encourage Active Retrieval

Use Dual Coding

Develop Metacognition

Cognitive Domain	Affective Domain
Teacher tool: *Refutation Texts*	
Teacher tool: *Doodling (and Summarizing)*	
Teacher tool: *Interleaving*	