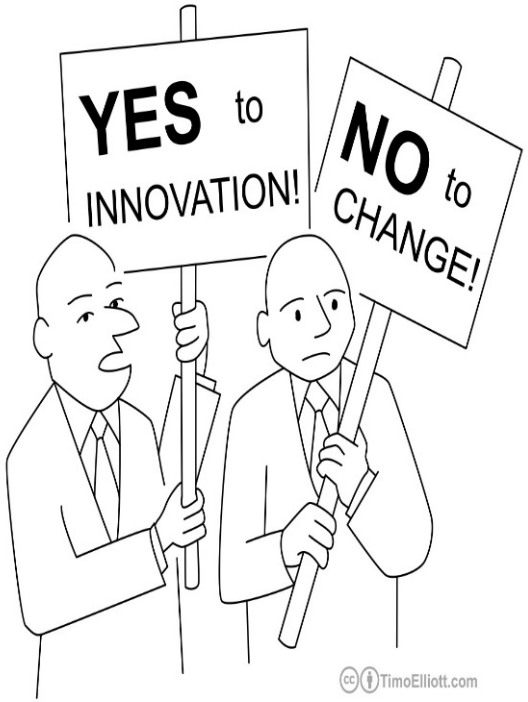

"We only have two demands!
Why don't people just give us what we want?"

You Don't Want a Culture of (Learning) Innovation

Dr. Jeff D Borden

Dean, School of Leadership Studies

@bordenj

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Scale of the Universe

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JB Jeff Borden

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Advanced Instruction

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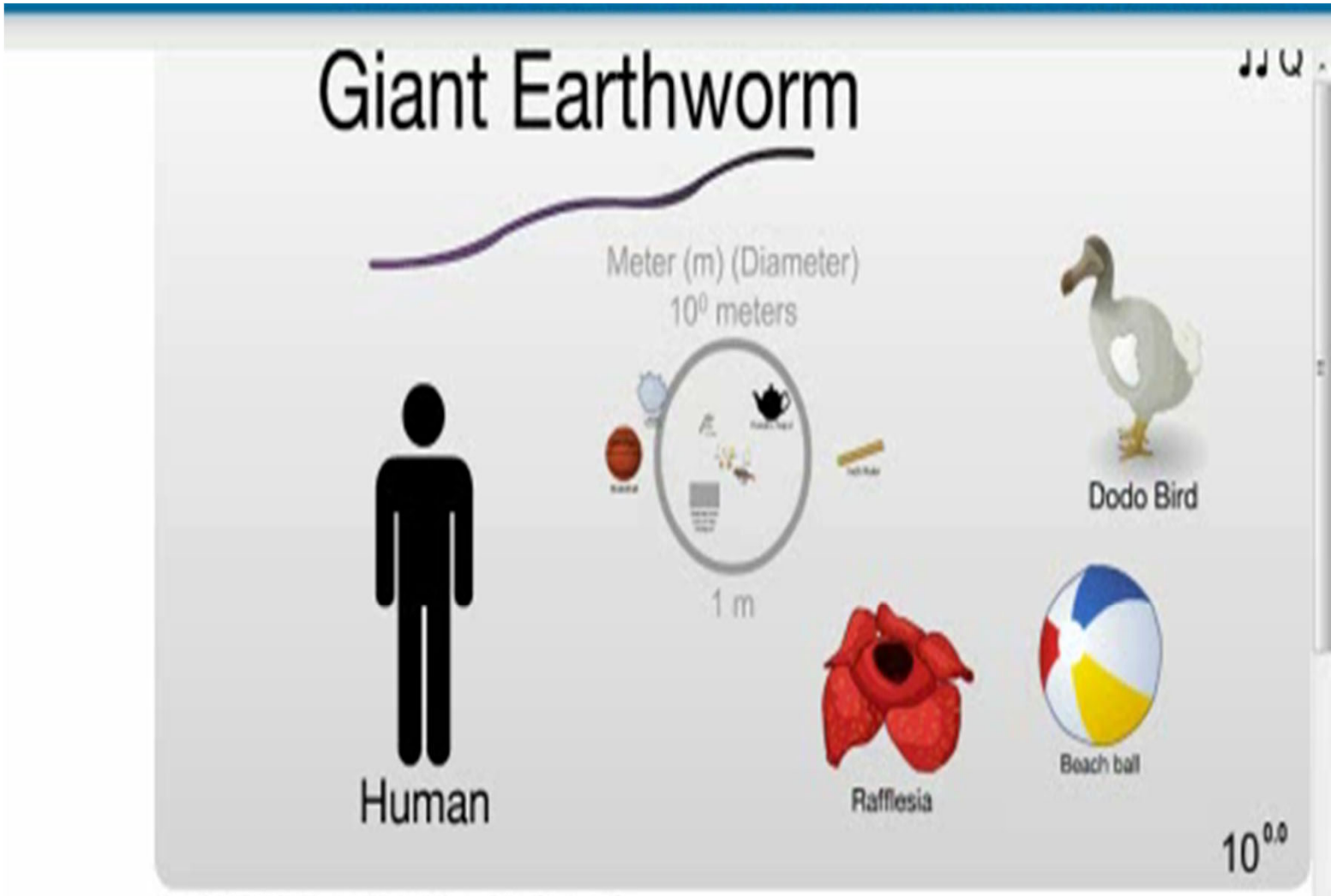

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Serif vs Sans Serif?

A:

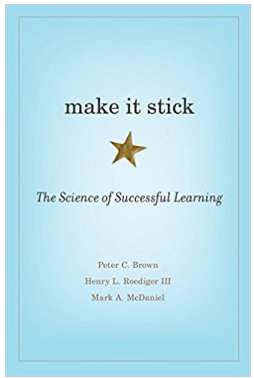
One of the two of these examples is a serif font whereas the other is a sans serif font. Online learning should leverage one of these to promote learning. Which one?

B:

One of the two of these examples is a serif font whereas the other is a sans serif font. Online learning should leverage one of these to promote learning. Which one?

Desirable Difficulties

Using fonts that are slightly harder to read improve memory, speed up scaffolding, and increase learning outcomes (Diemand-Yauman, Oppenheimer, & Vaughan)



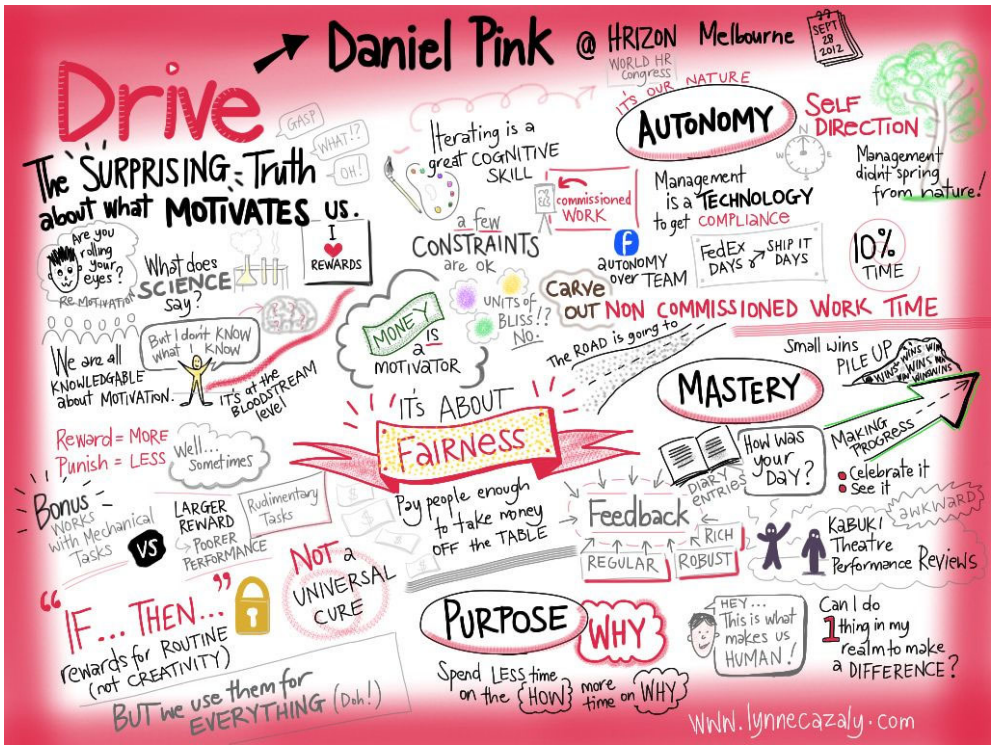
Fonts / Words / Letters

Aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mttaer in waht oredr the ltteers in a wrod are, the olny iprmoetnt tihng is taht the frist and lsat ltteer be at the rghit pclae. The rset can be a toatl mses and you can sitll raed it wouthit porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

"…Unfortunately, conditions that lend themselves to rapid performance gains, often fail to support long term retention, whereas the conditions that do, seem to create challenges and slow the rate of apparent learning, thus making them uncomfortable and unpopular with many students. It is these uncomfortable, but necessary challenges that Bjork deems to be the "desirable difficulties". (Make It Stick)

Dan Pink (Drive, 2005)

"There is a significant gap between what scientists know about how our brains work and what organizational behaviorists will tell you our institutions do."



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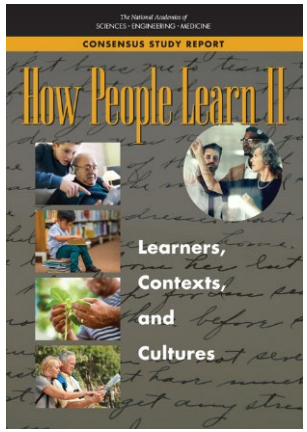
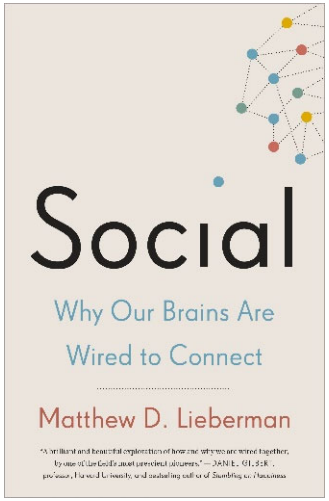
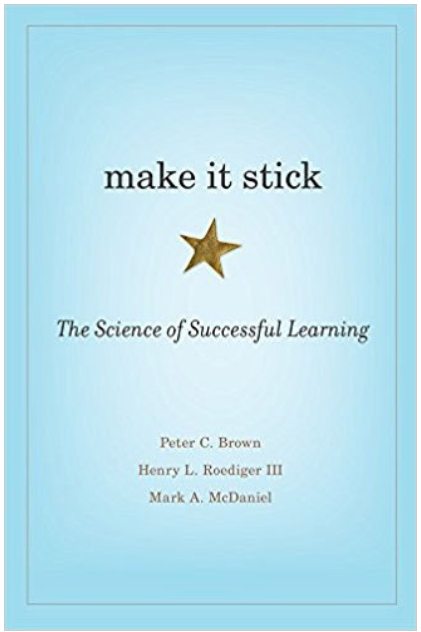
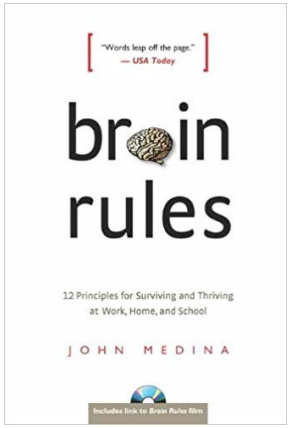
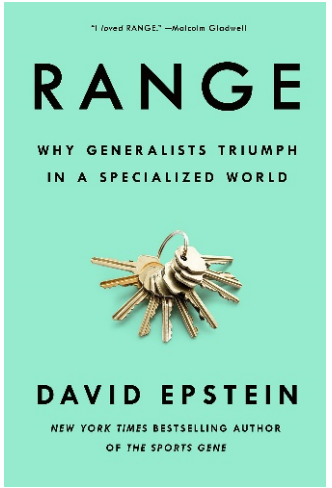
"There are no "best" ways to teach..."

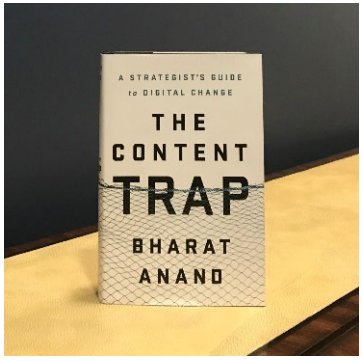


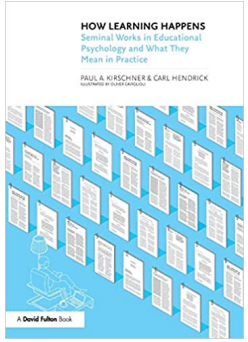


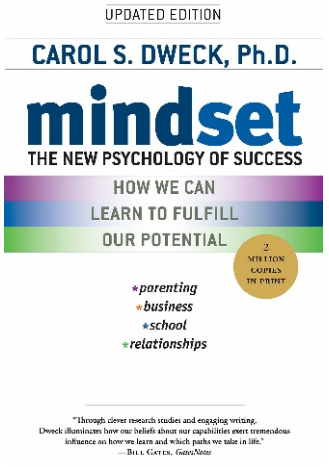












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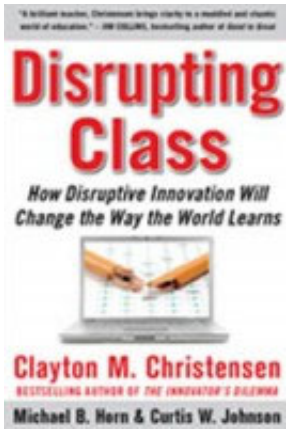
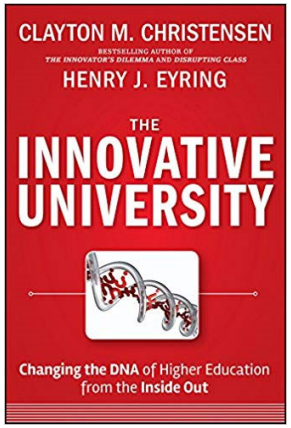
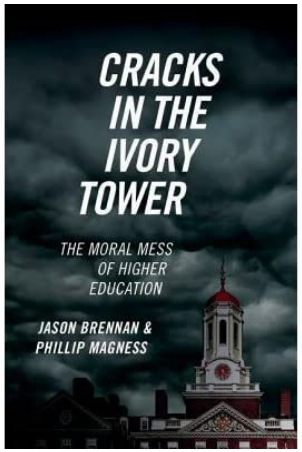
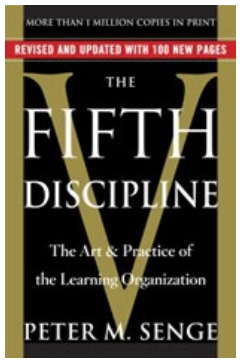
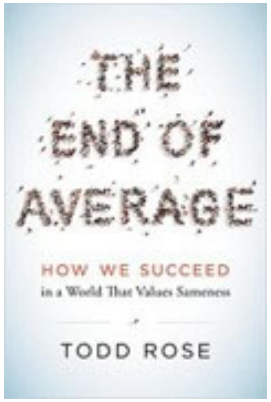
"There are no "right" ways to innovate..."

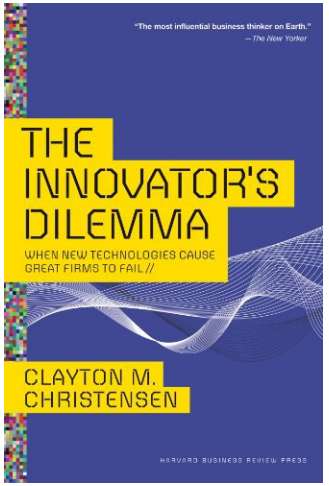












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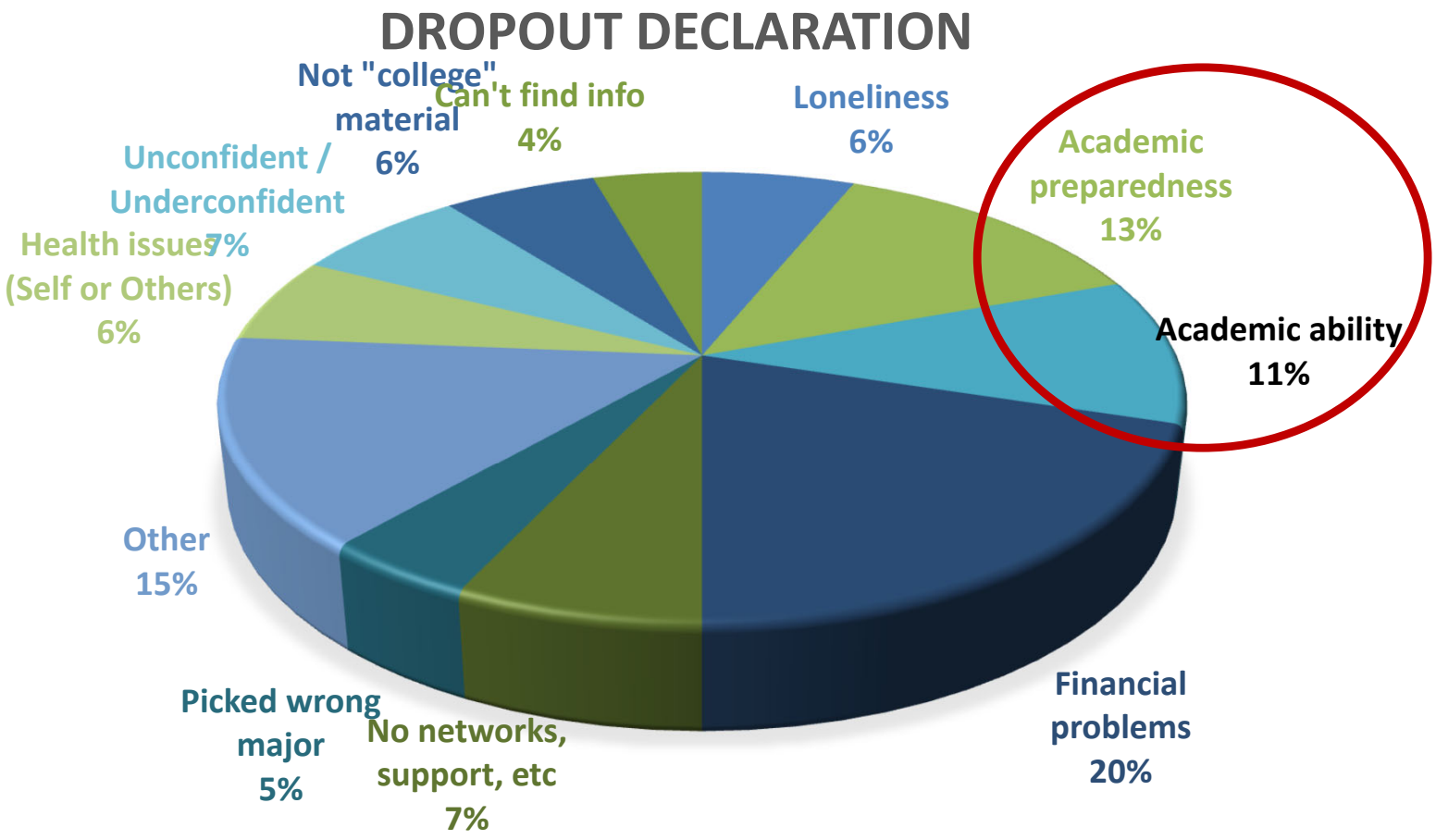
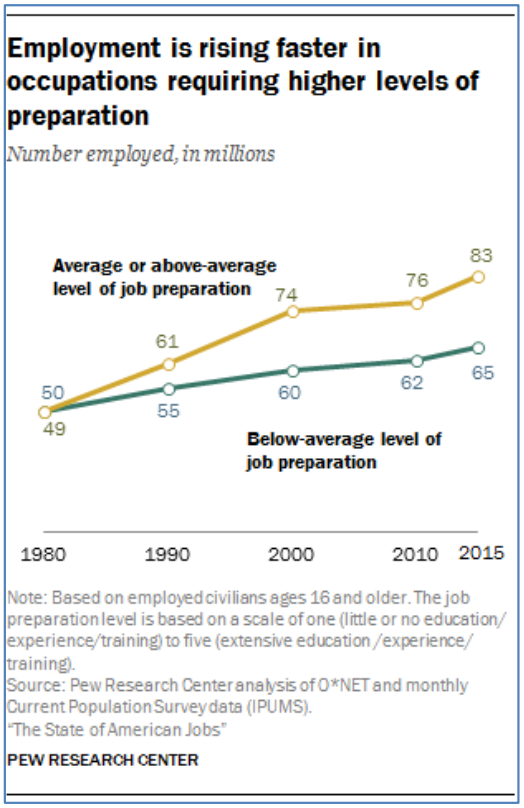
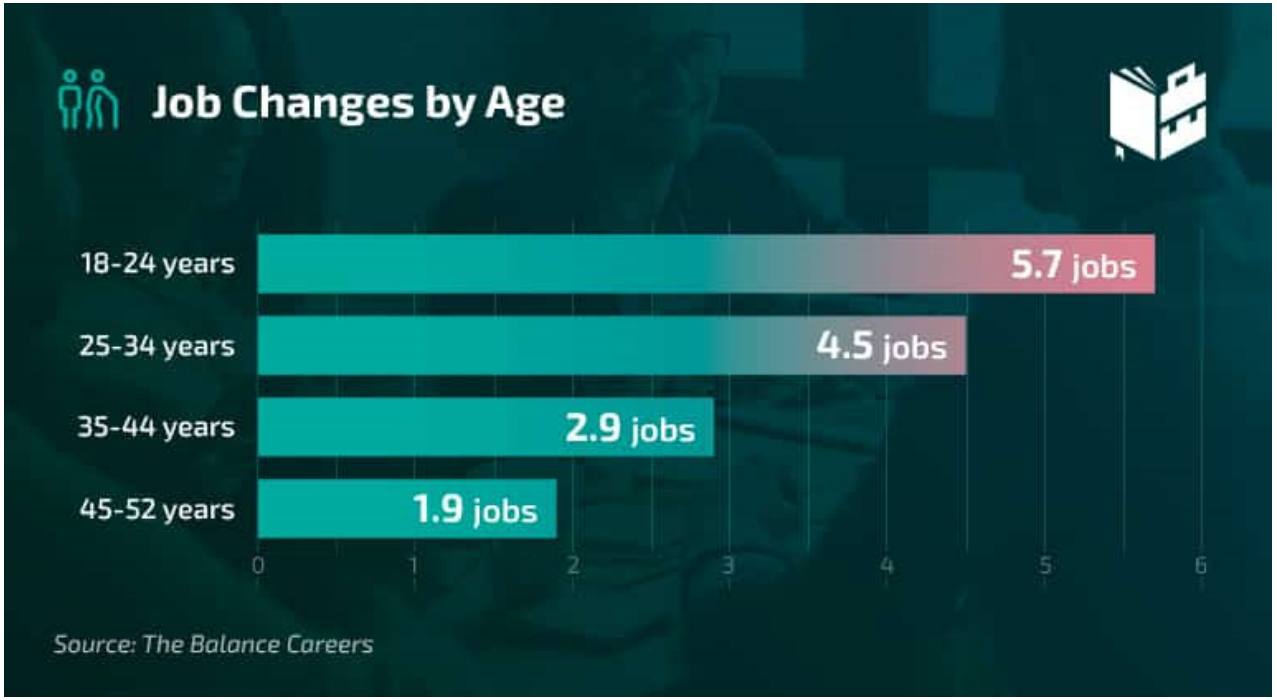
Why Students Dropout (2018-19)



- Hanson, Melanie. "College Dropout Rates" EducationData.org, November 22, 2021
- Persistence & Retention – 2019. National Student Clearinghouse. https://nscresearchcenter.org/snapshotreport35-first-year-persistence-and-retention/
- Yearly Success & Progress Rates – 2019. National Student Clearninghouse. https://nscresearchcenter.org/snapshot-report-yearly-success-and-progress-rates-2019/

Career Employment Has Changed





College as a Lifelong Learning Hub

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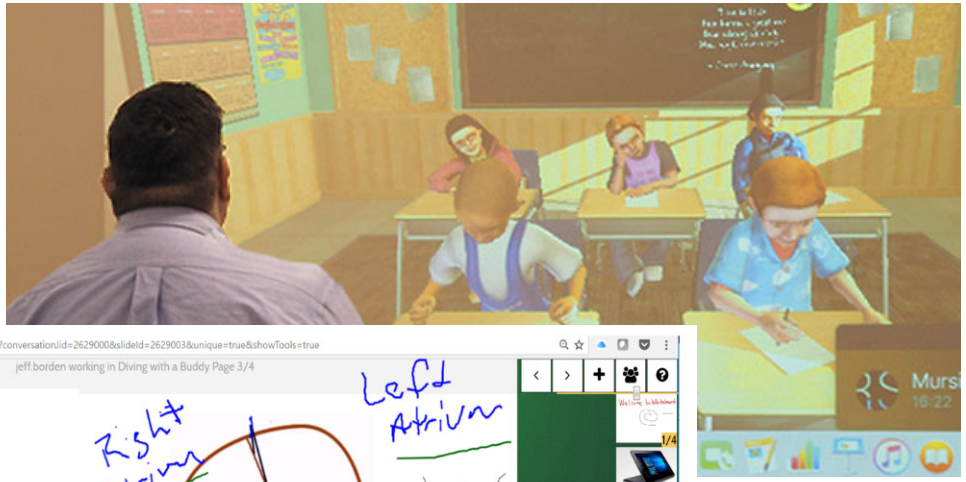
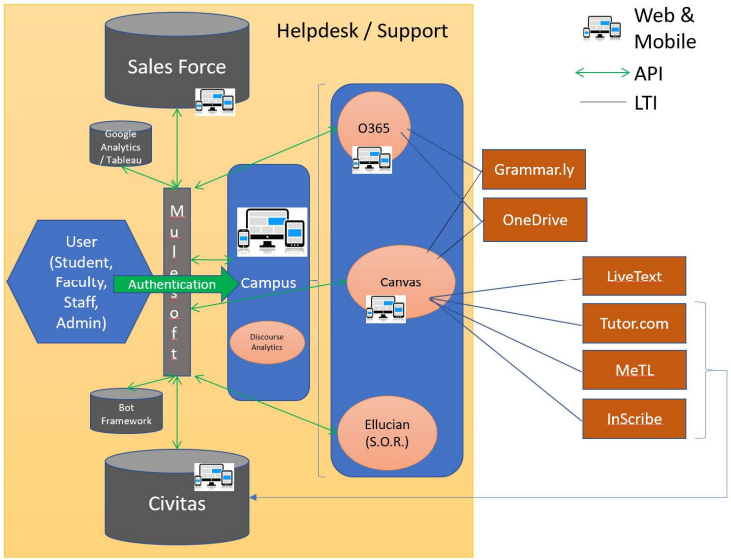
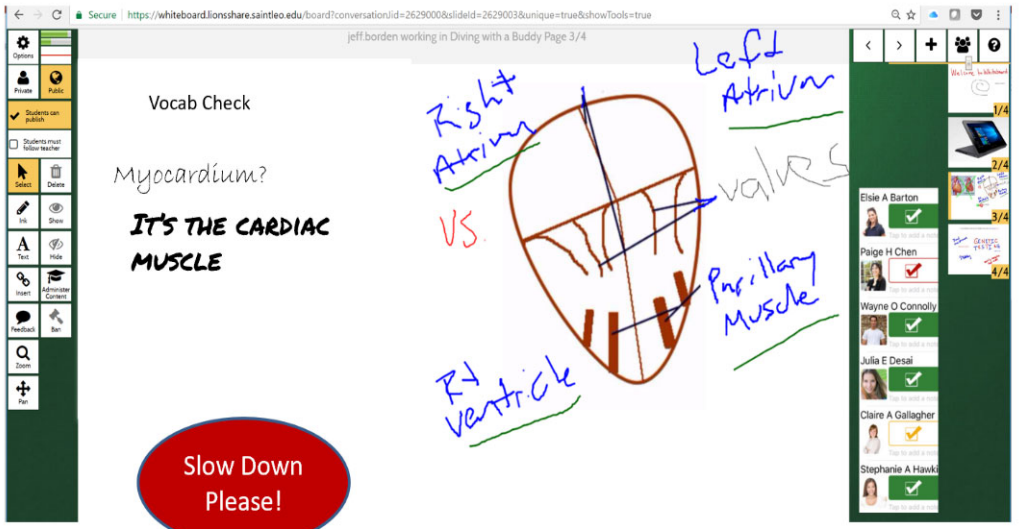
Dr. J's Innovation







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Dr. Jeff D Borden

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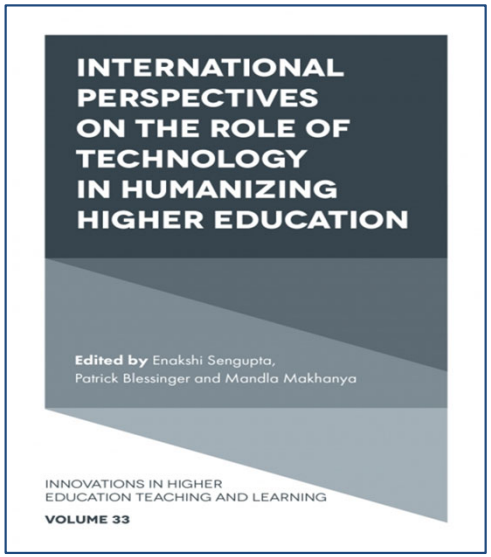
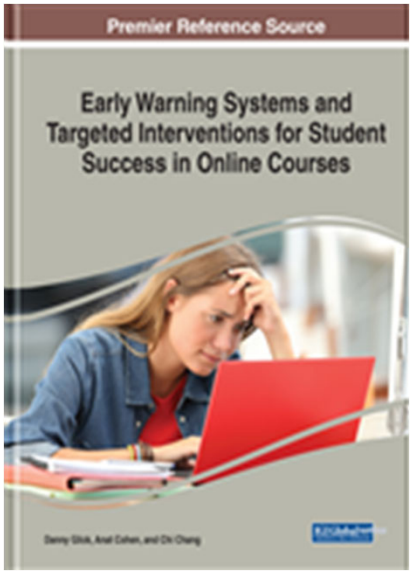
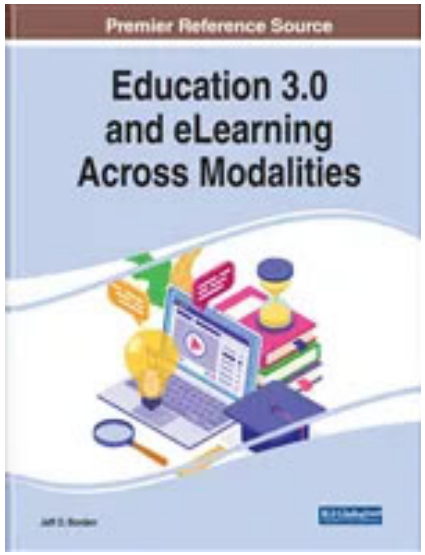
Dr. Jeff's Chapters / Books



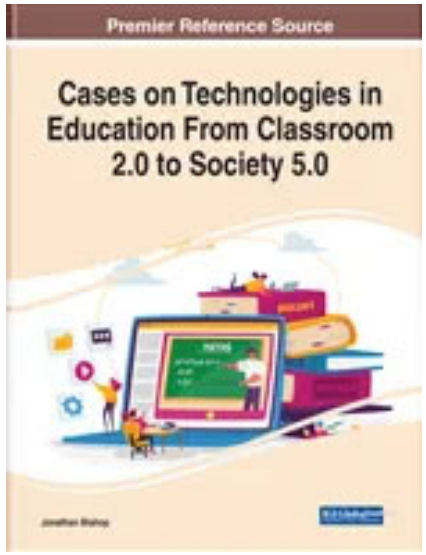
(Ch 5) **The Science and Technology of Interconnectedness**



(Ch 13) **Noncognitive Signals and Systems**: The Science and Technology of Connectedness



Anthology Editor (Preface / Ch 1) **Education 3.0**: What Is It and How Do We Achieve It?



(Ch 7) **Education 3.0**: Some Innovation Required

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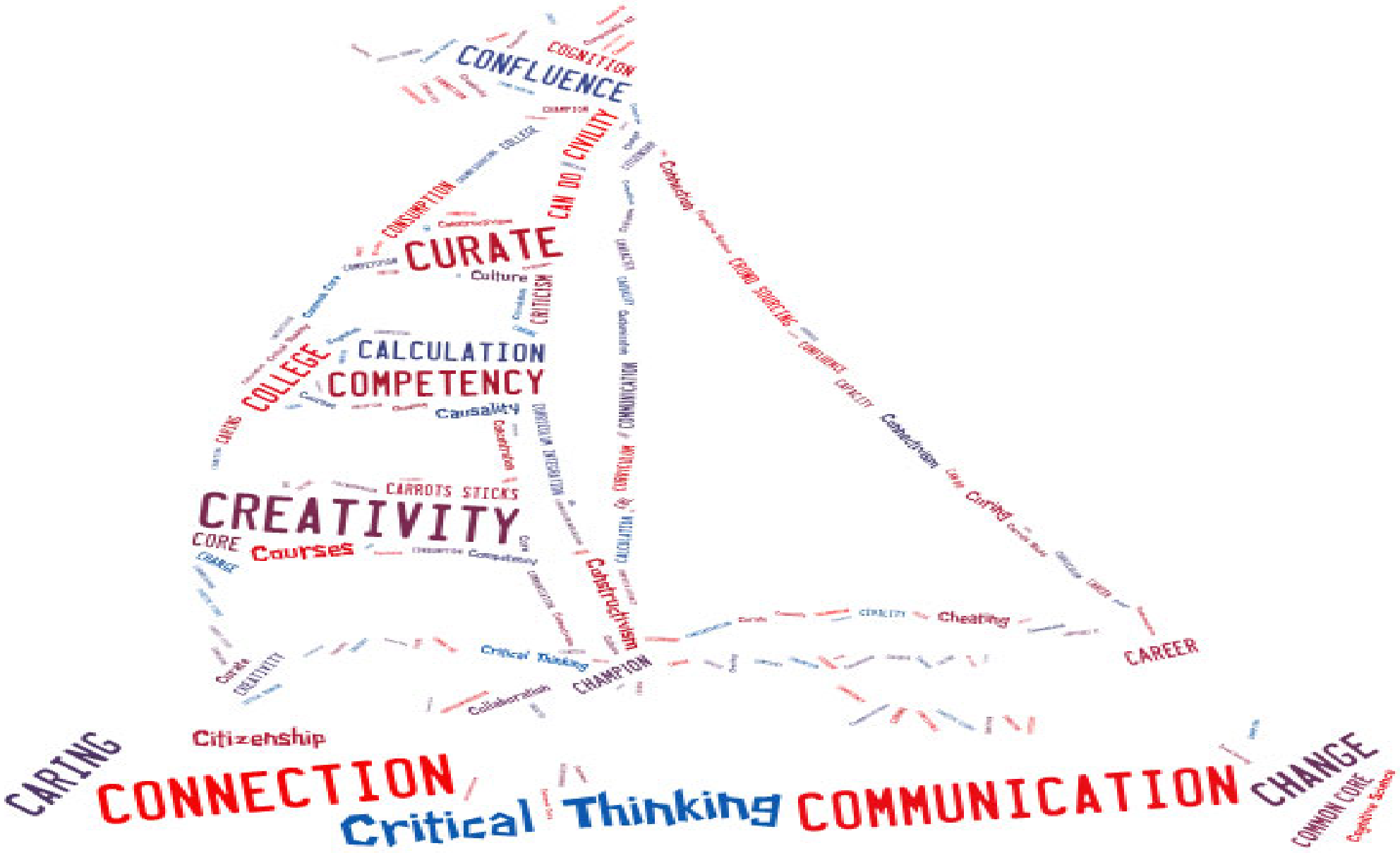
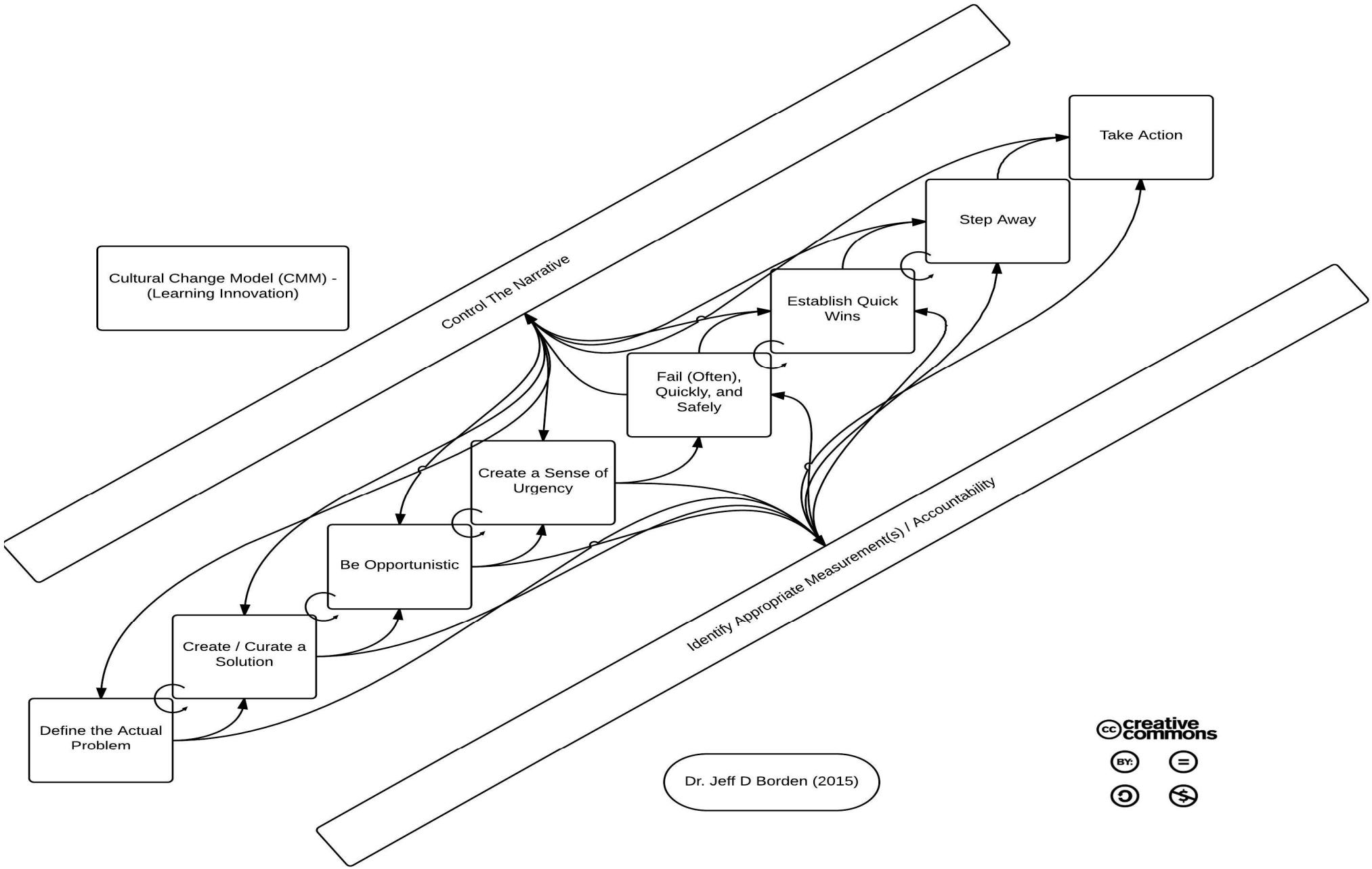
The "C's" of Learning Innovation



Learning Innovation Change Model Evolution



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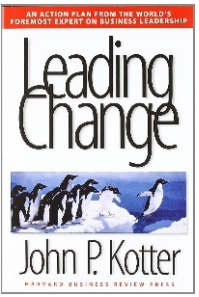
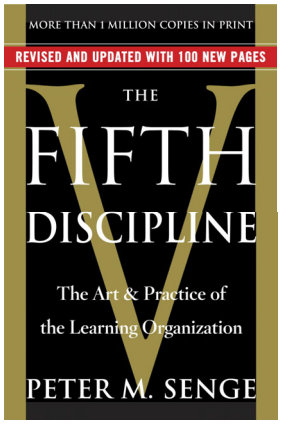
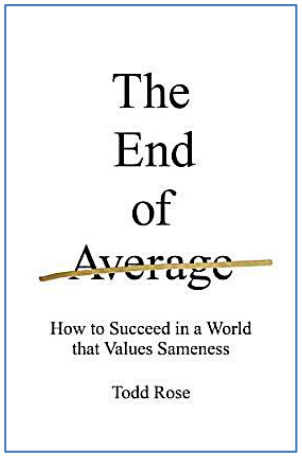
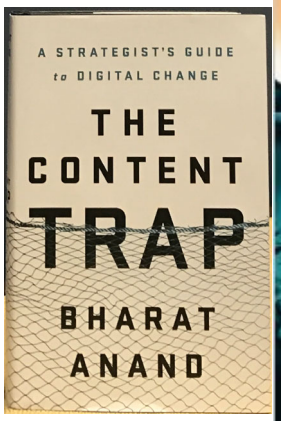
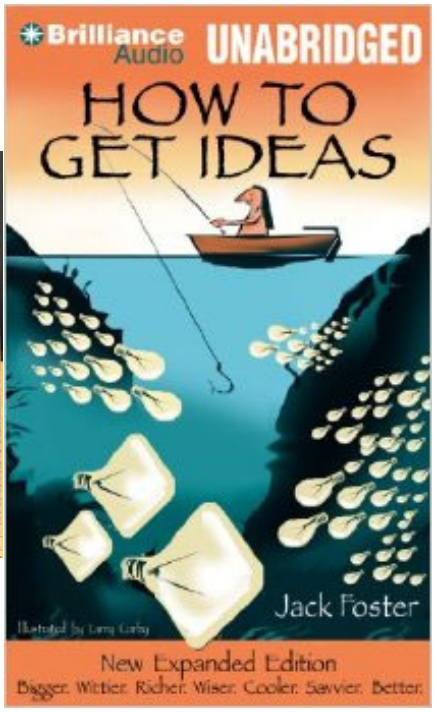
Learning Innovation Architecture

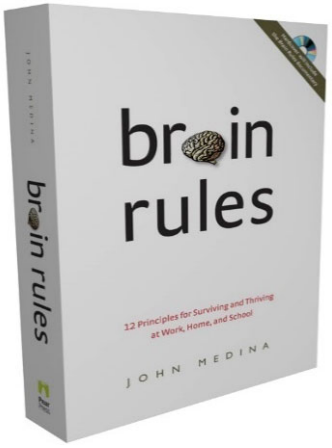


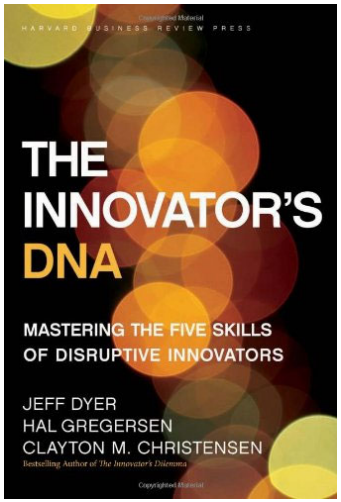


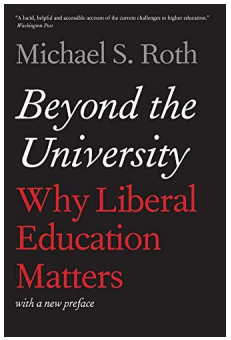


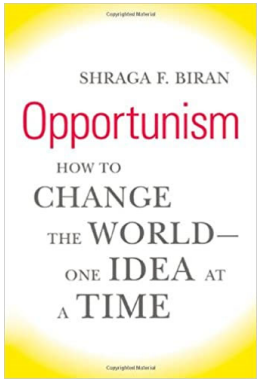












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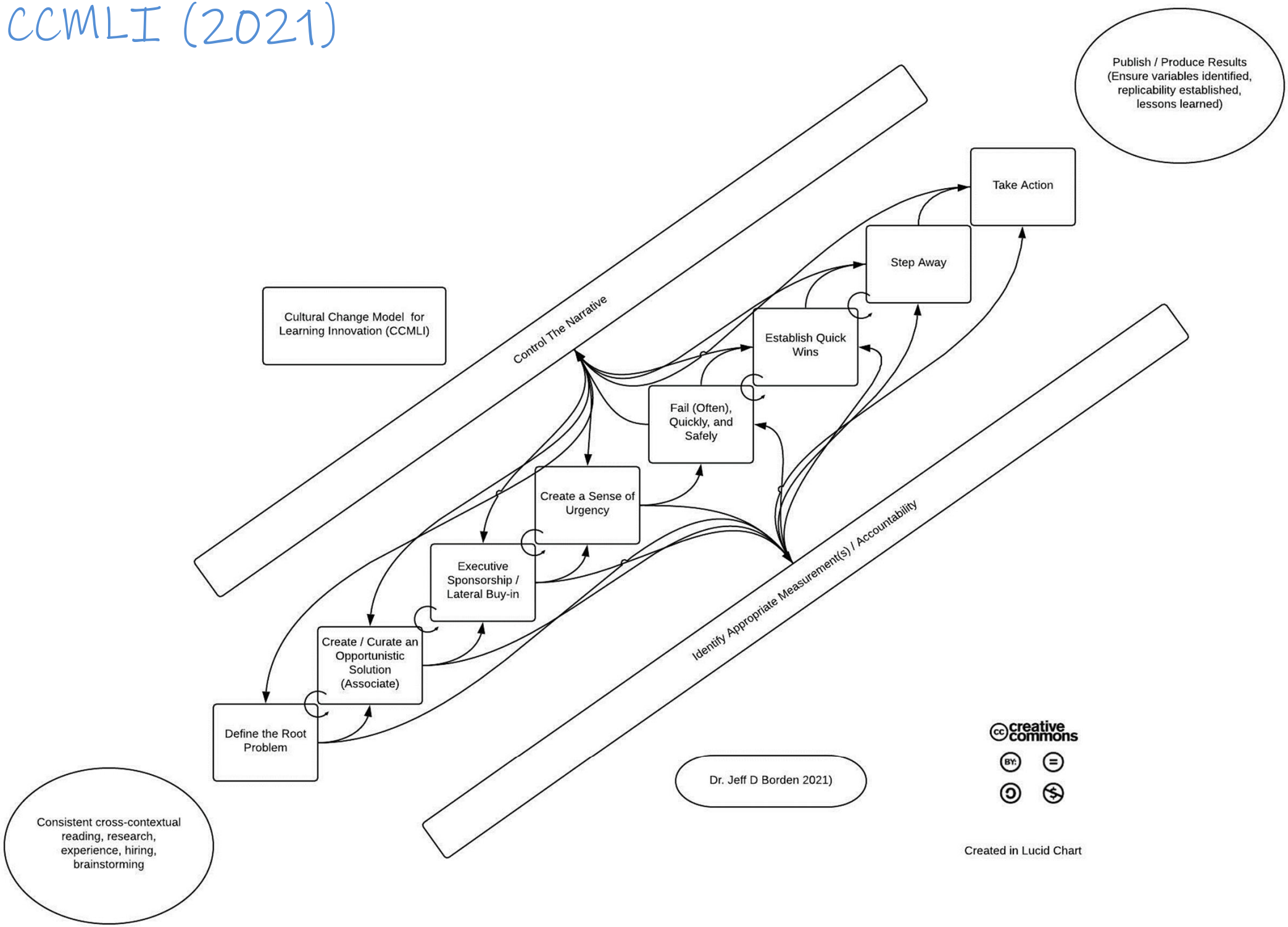
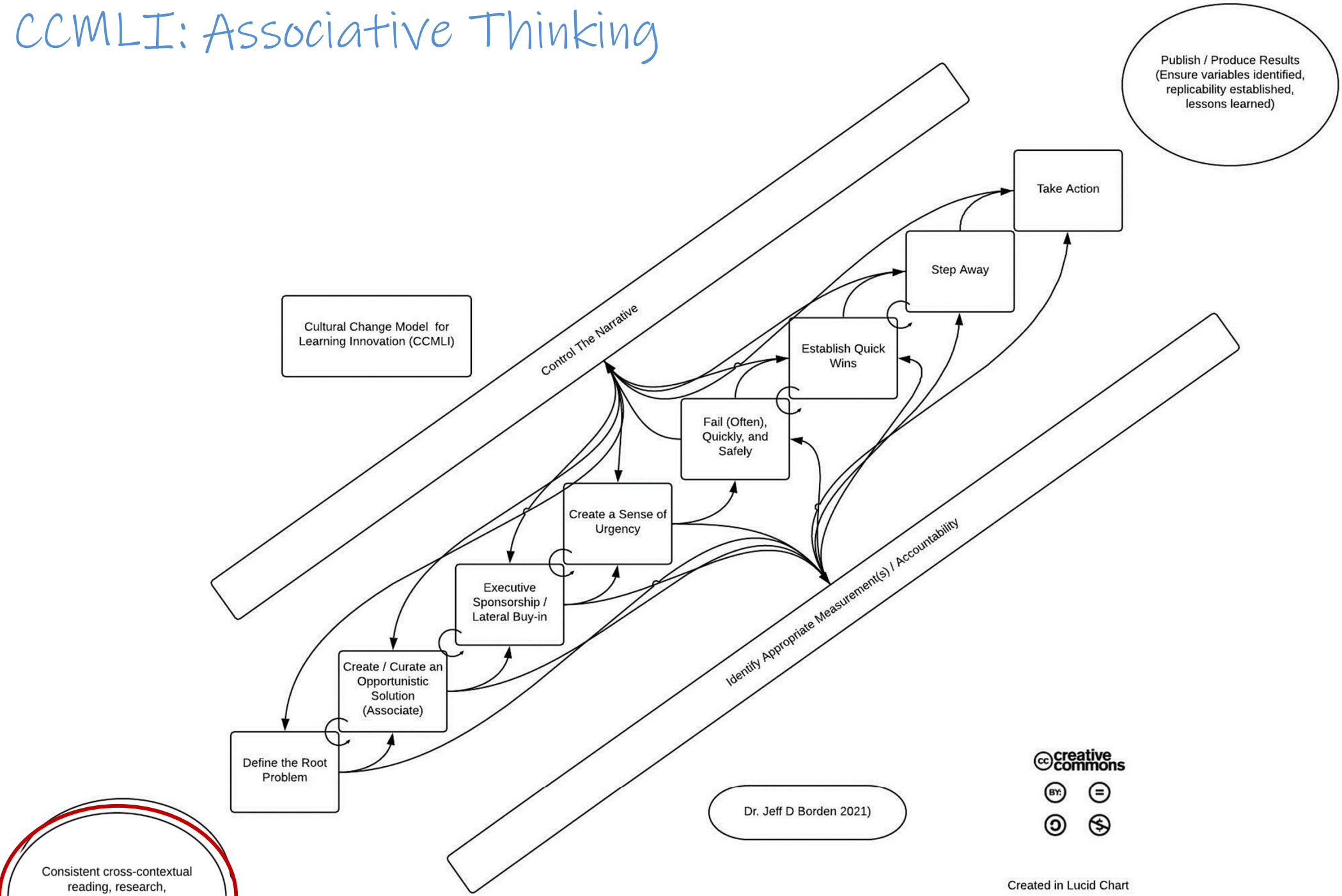
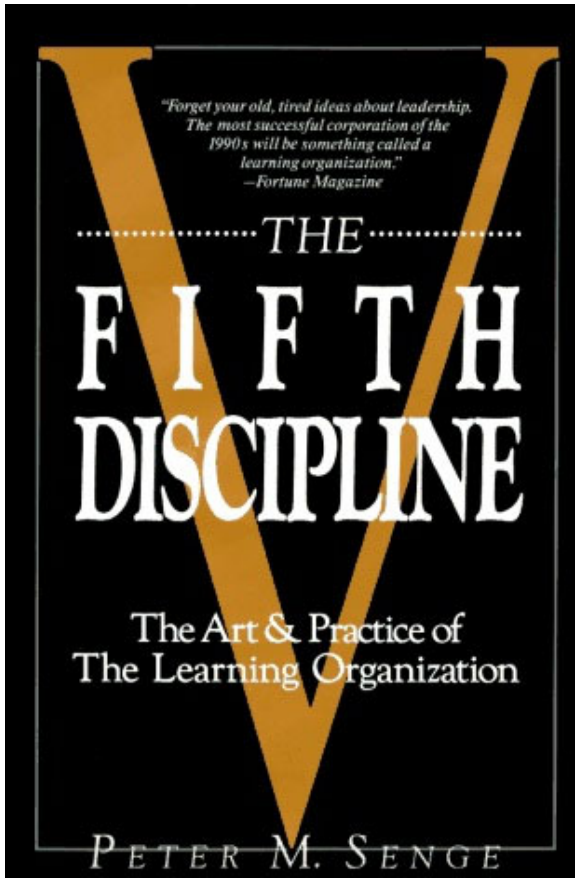
CCMLI (2021)

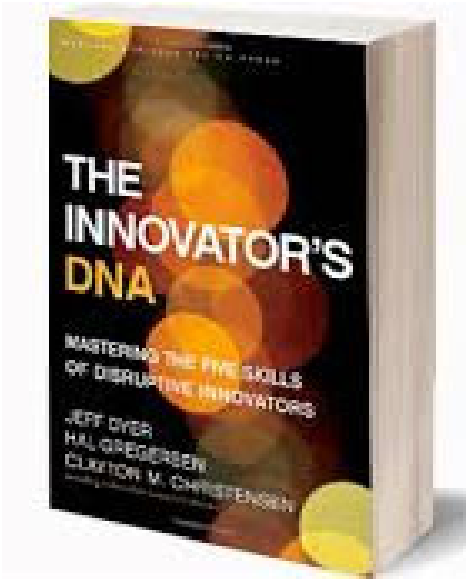

Publish / Produce Results (Ensure variables identified, replicability established, lessons learned)
Cultural Change Model for Learning Innovation (CCMLI)
Control The Narrative
Take Action
Step Away
Establish Quick Wins
Fail (Often), Quickly, and Safely
Create a Sense of Urgency
Executive Sponsorship / Lateral Buy-in
Create / Curate an Opportunistic Solution (Associate)
Define the Root Problem
Identify Appropriate Measurement(s) / Accountability
Dr. Jeff D Borden 2021)
Consistent cross-contextual reading, research, experience, hiring, brainstorming
creative commons
Created in Lucid Chart

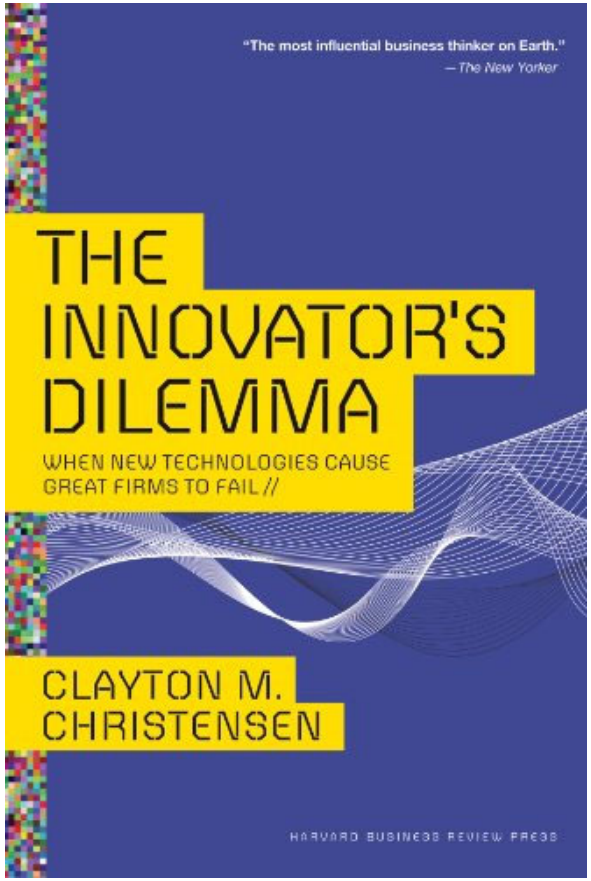
CCMLI: Associative Thinking



Innovation = Associating (aka Medici Effect)





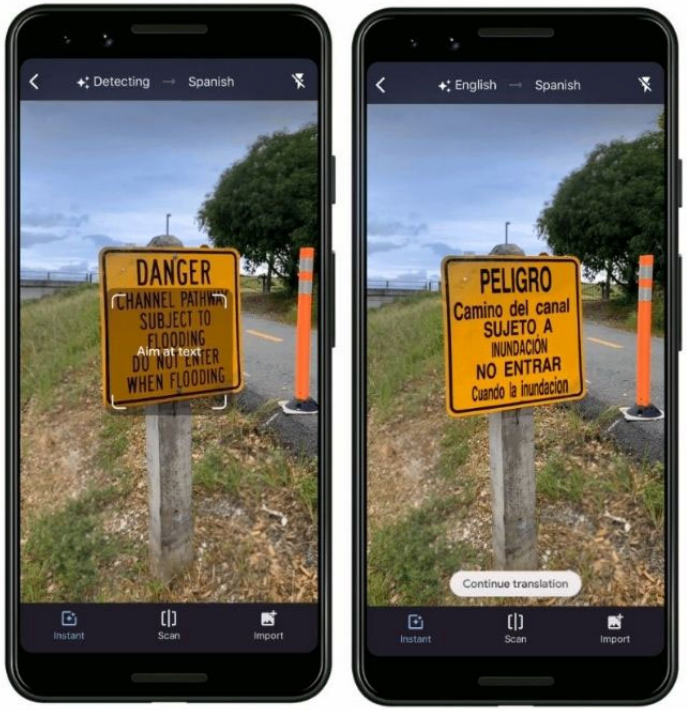


Translate This Quote

"Ninguém fala assim, mas acho que a inteligência artificial é quase uma disciplina de humanidades. To naprawdę próba zrozumienia ludzkiej inteligencji i ludzkiego poznania."

Portuguese & Polish

Sebastian Thrun on AI



"Nobody phrases it this way, but I think that artificial intelligence is almost a humanities discipline. It's really an attempt to understand human intelligence and human cognition." --The Digital Playbook

AI Interlude

https://arxiv.org/pdf/2303.12712.pdf

1. Conspiracies & Propaganda...
2. Discontinuous Tasks
3. Fermi Questions
4. Prompt Engineering
5. Theory of Mind: Ask about an upcoming interview
6. MS Co-Pilot
7. Forced Retrieval

Sparks of Artificial General Intelligence:
Early experiments with GPT-4

Sébastien Bubeck Varun Chandrasekaran Ronen Eldan Johannes Gehrke
Eric Horvitz Ece Kamar Peter Lee Yin Tat Lee Yuanzhi Li Scott Lundberg
Harsha Nori Hamid Palangi Marco Tulio Ribeiro Yi Zhang

Microsoft Research

arXiv:2303.12712v5 [cs.CL] 13 Apr 2023

Abstract

Artificial intelligence (AI) researchers have been developing and refining large language models (LLMs) that exhibit remarkable capabilities across a variety of domains and tasks, challenging our understanding of learning and cognition. The latest model developed by OpenAI, GPT-4 [Ope23], was trained using an unprecedented scale of compute and data. In this paper, we report on our investigation of an early version of GPT-4, when it was still in active development by OpenAI. We contend that (this early version of) GPT-4 is part of a new cohort of LLMs (along with ChatGPT and Google's PaLM for example) that exhibit more general intelligence than previous AI models. We discuss the rising capabilities and implications of these models. We demonstrate that, beyond its mastery of language, GPT-4 can solve novel and difficult tasks that span mathematics, coding, vision, medicine, law, psychology and more, without needing any special prompting. Moreover, in all of these tasks, GPT-4's performance is strikingly close to human-level performance, and often vastly surpasses prior models such as ChatGPT. Given the breadth and depth of GPT-4's capabilities, we believe that it could reasonably be viewed as an early (yet still incomplete) version of an artificial general intelligence (AGI) system. In our exploration of GPT-4, we put special emphasis on discovering its limitations, and we discuss the challenges ahead for advancing towards deeper and more comprehensive versions of AGI, including the possible need for pursuing a new paradigm that moves beyond next-word prediction. We conclude with reflections on societal influences of the recent technological leap and future research directions.

Contents

1 Introduction 4
1.1 Our approach to studying GPT-4's intelligence 6
1.2 Organization of our demonstration 8

2 Multimodal and interdisciplinary composition 13

Consistent, cross-contextual reading, research, experience, hiring, brainstorming, etc.

- McEwan applied fractal graphics to gold mining after attending a computer conference about open-source.

- Doctors created smaller injection needles based on mosquitos.

- Alexander Graham Bell made the phone's diaphragm after going to audiology school, understanding how the human ear works.

- Ford created the first automobile assembly line based on one of his executive's (William Klann) work at a slaughterhouse.

A ●–	J ●–––	S ●●●
B –●●●	K –●–	T –
C –●–●	L ●–●●	U ●●–
D –●●	M ––	V ●●●–
E ●	N –●	W ●––
F ●●–●	O –––	X –●●–
G ––●	P ●––●	Y –●––
H ●●●●	Q ––●–	Z ––●●
I ●●	R ●–●	

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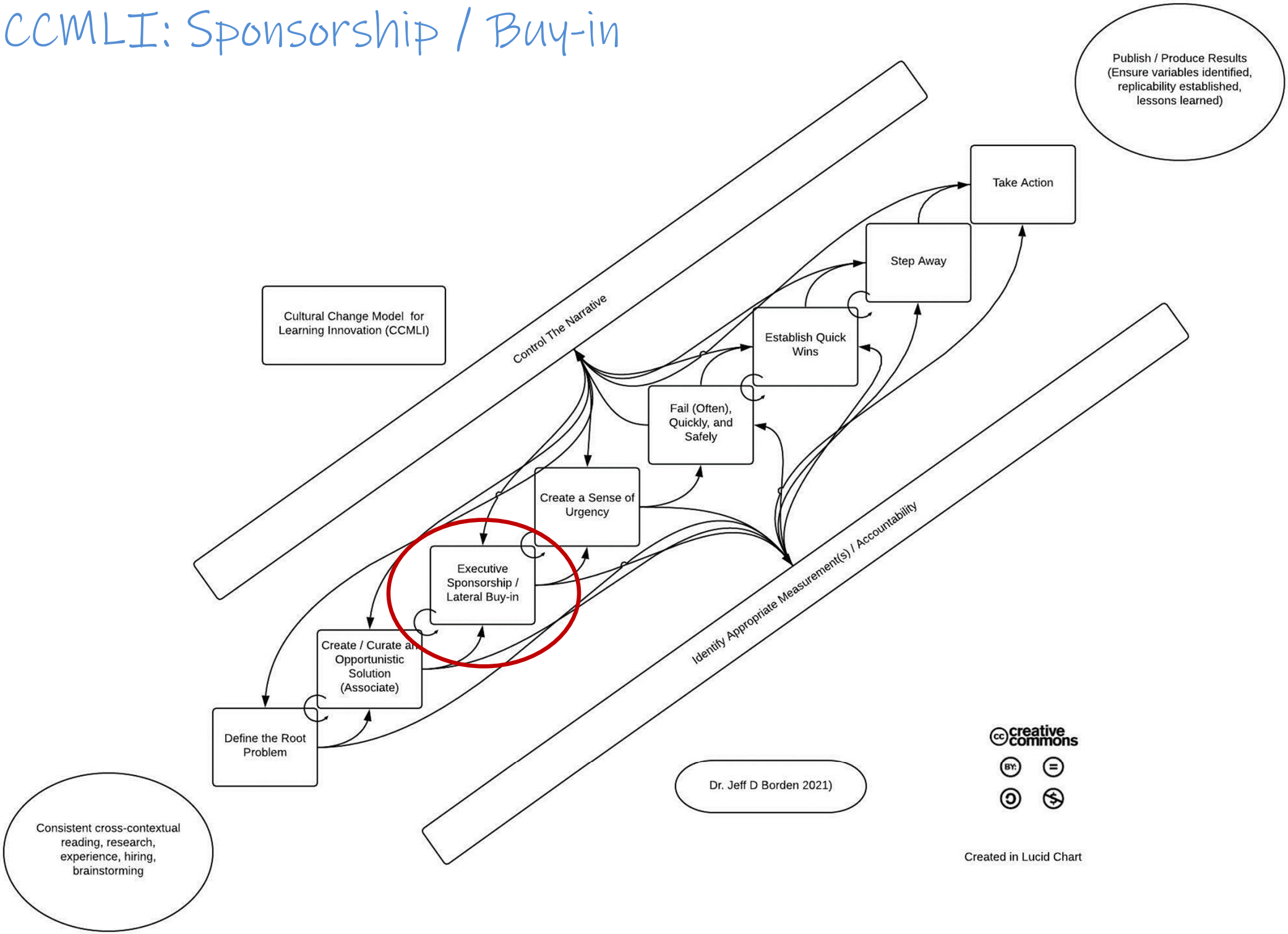
CCMLI: Sponsorship / Buy-in



Who Innovates? Leaders with Why AND How...

"...top executives do not feel personally responsible for coming up with strategic innovations. Rather, they feel responsible for facilitating the innovation process. In stark contrast, senior executives of the most innovative companies—a mere 15% in our study—don't delegate creative work. They do it themselves."

Dyer (et.al.), Innovator's DNA, 2011

Stig Leschly

Harvard innovation labs

Explore Events Ventures Our Labs

Latest News

Innovator Stig Leschly Encourages Failure at President's Challenge Launch

By Brandon J. Dixon
10/23/2015

Business

Jeff Bezos' 'shadow' most coveted job at Amazon

Most coveted job at company is adviser who follows and observes Bezos everywhere

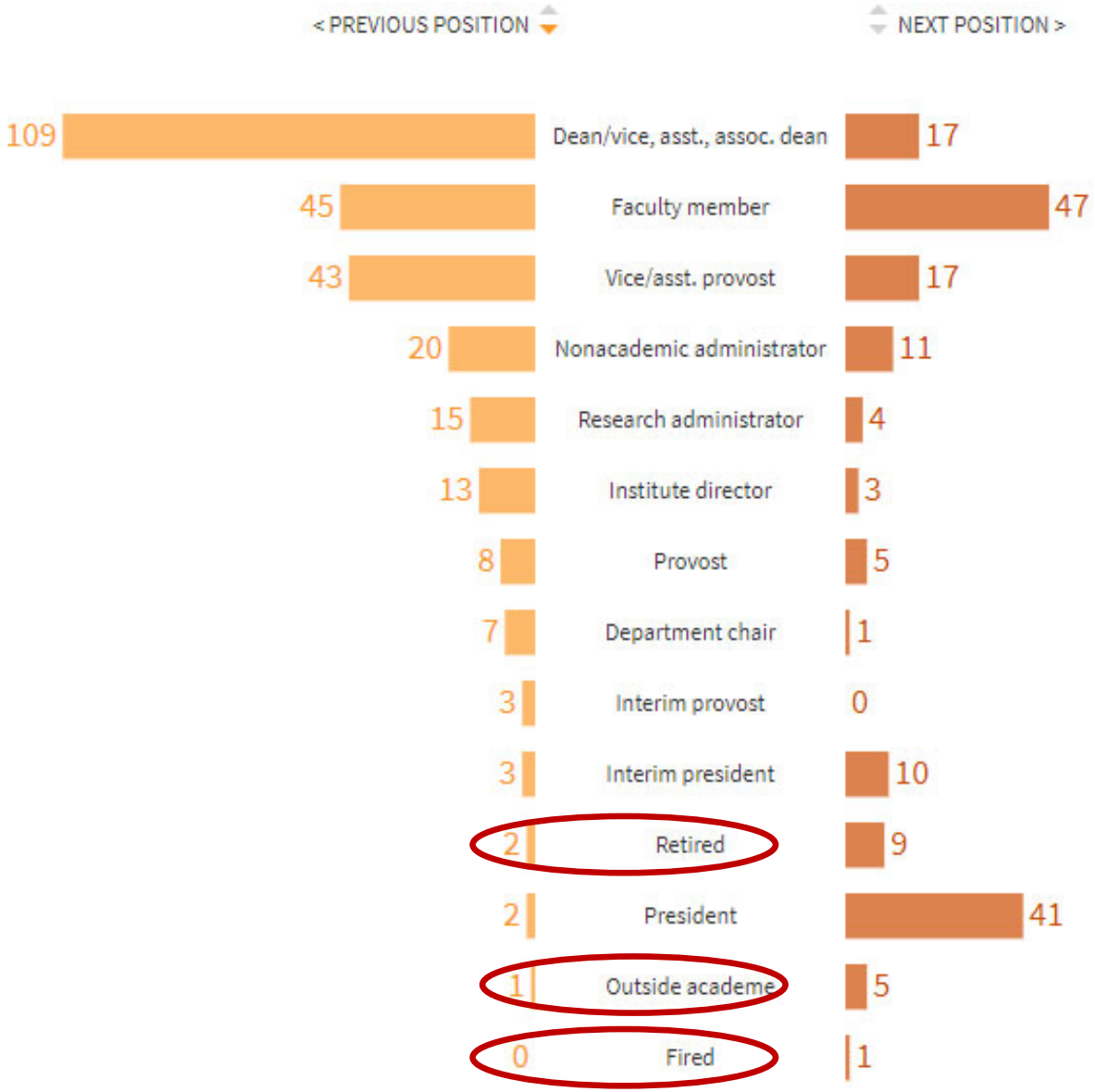
SENIOR LECTURER OF BUSINESS ADMINISTRATION

Stig is currently a Senior Lecturer at Harvard Business School where he teaches entrepreneurship. Stig was also a lecturer on entrepreneurship at HBS from 2001-2004. Stig is a primarily a practicing entrepeneur. Click "read more" for a detailed biography.

@bcrdenj

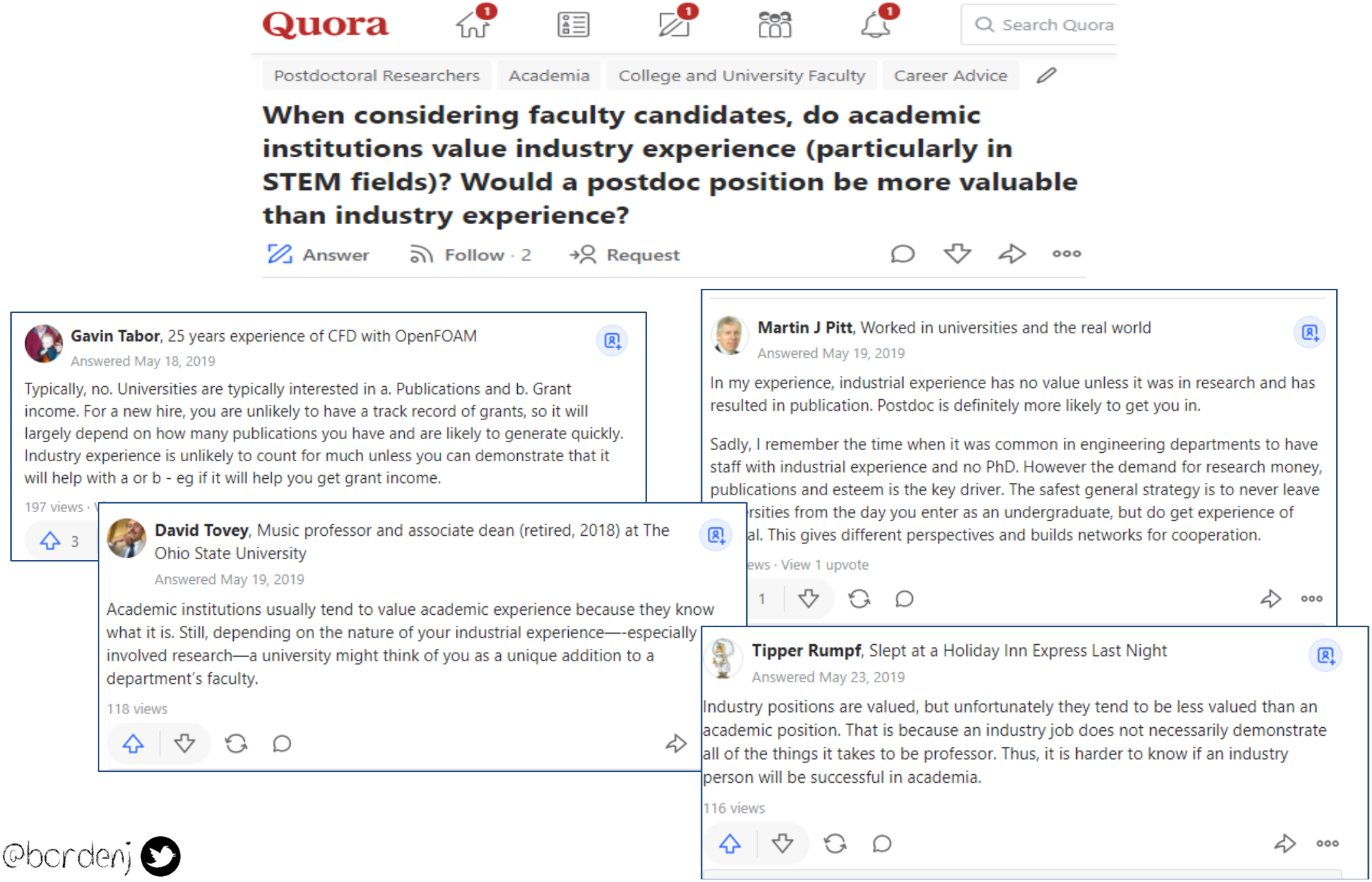
School of Leadership Studies

Provost & Associative Thinking



SOURCES: Higher Education Directory; *Chronicle* research and reporting

Faculty & Associative Thinking



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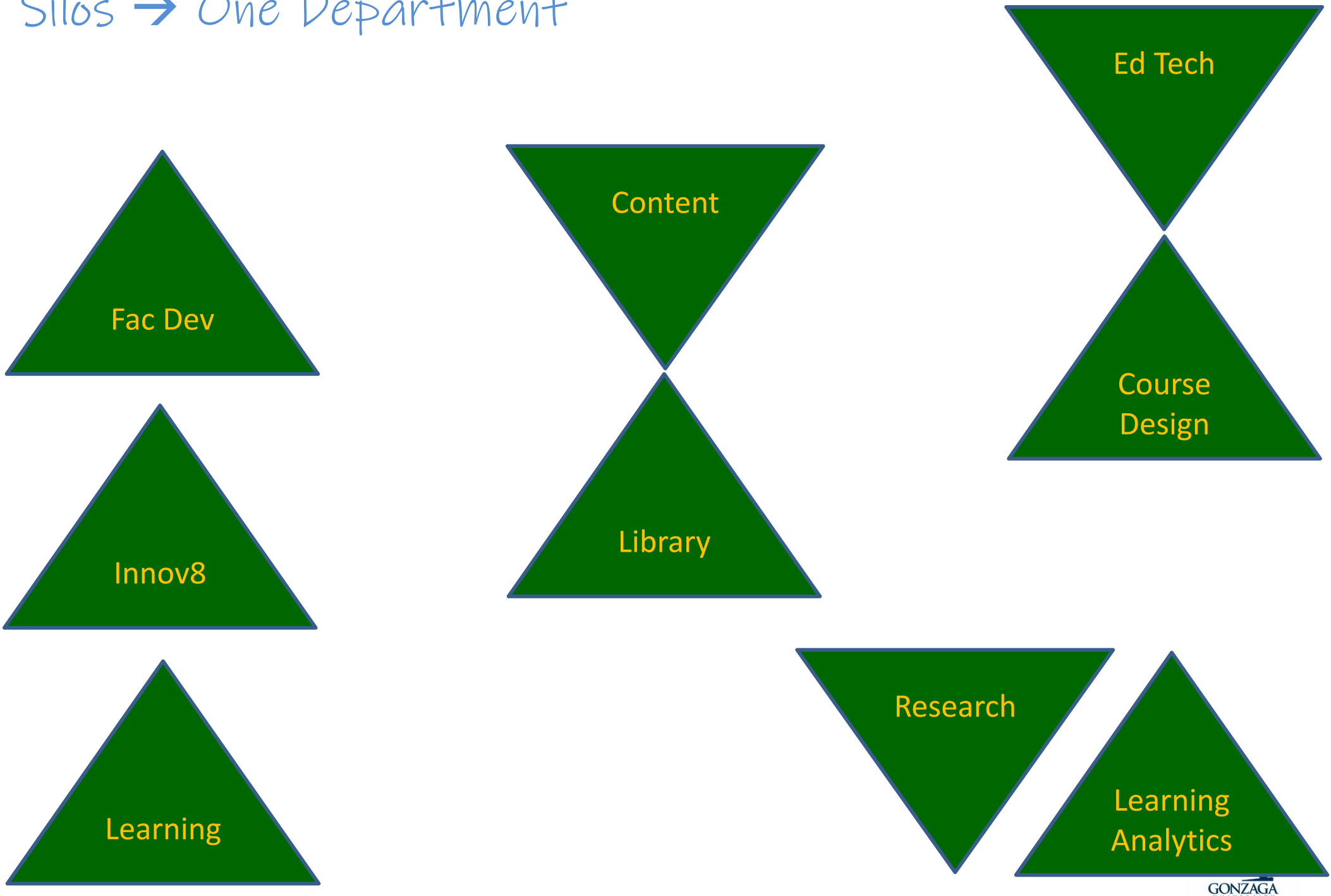
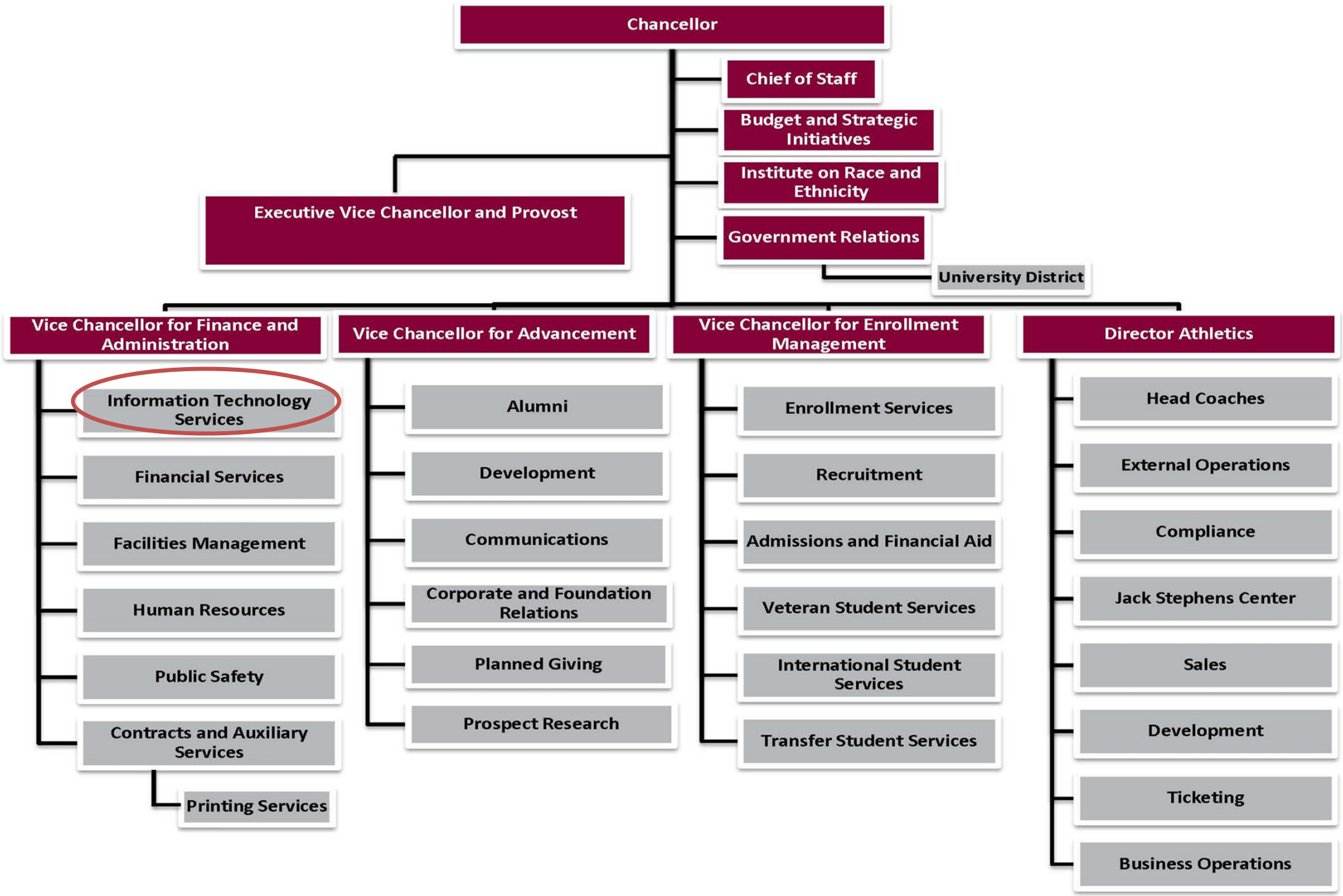
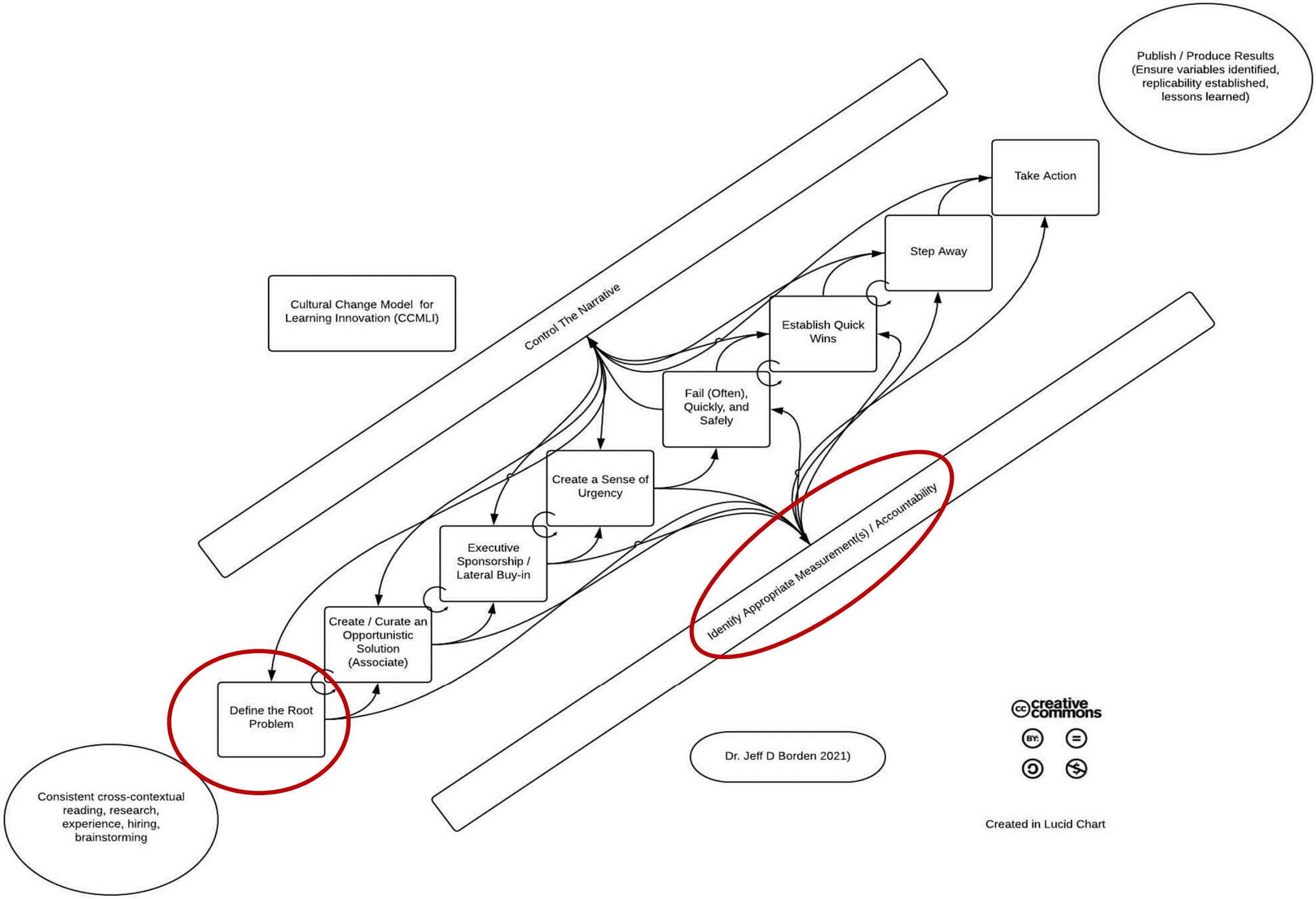
Silos → One Department



Do You REALLY Want Innovation?



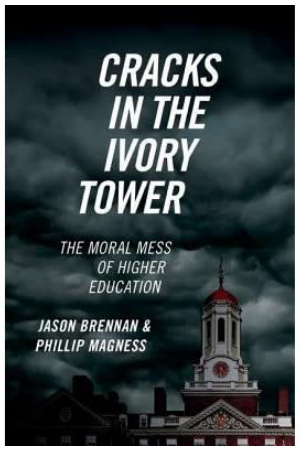
CCMLI: Find the REAL Problem (& Measure It)

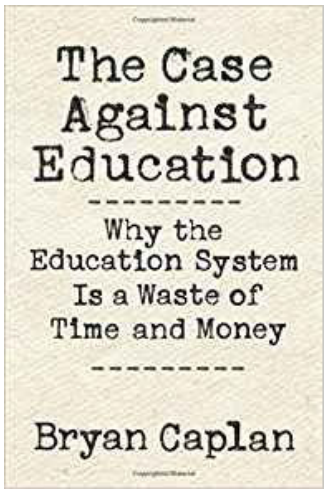


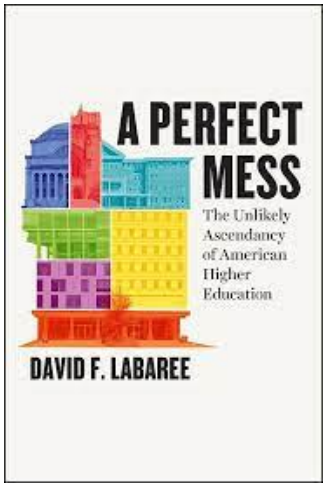
Does Learning Happen?

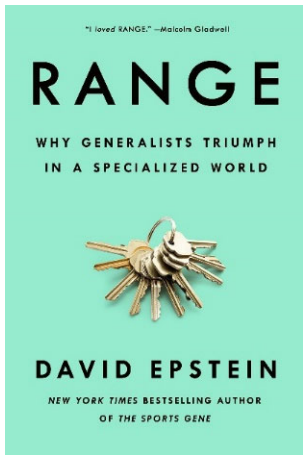
Education does not measurably impact:

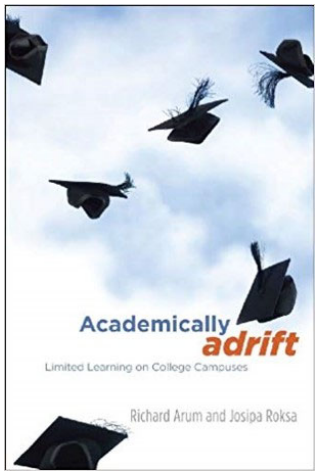
- Learning
- Creativity
- Critical Thinking
- Job Skills
- Transference

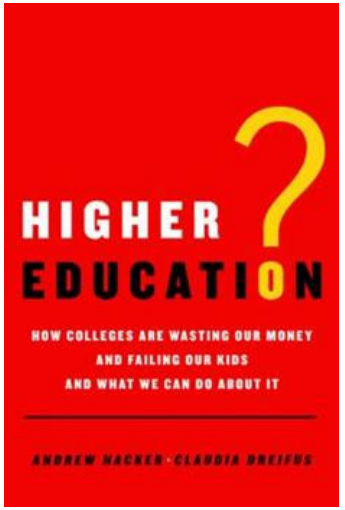












Can Higher Ed Save Itself?
Business as usual won't solve the existential challenges we face. Will anything?

THE REVIEW

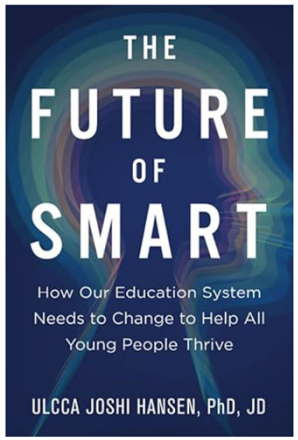
By Gabriel Paquette

MARCH 4, 2021

THE CHRONICLE of Higher Education

9 Reasons College Professors Are TRULY Bad At Teaching

By Chris Drew (PhD) / August 31, 2023



GLOBAL

Why university lecturers need a teaching certificate

Tony Bates 30 November 2019

Share Tweet Share 182

Investigating tenure controversies: Basing faculty promotion on flawed variables doesn't help the selection of competent academics.

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Pick a Card

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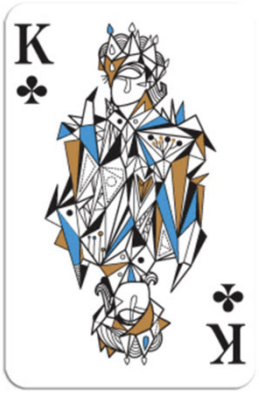

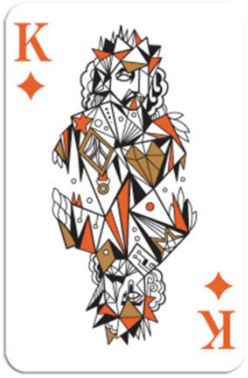

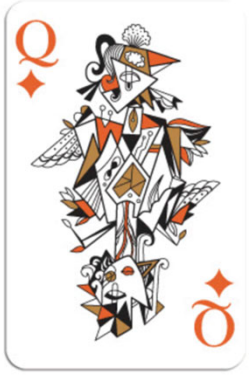

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Lectures = Less Success

ScienceInsider
Breaking news and analysis from the world of science policy

ALESZU BAJAK Follow @sciencenews

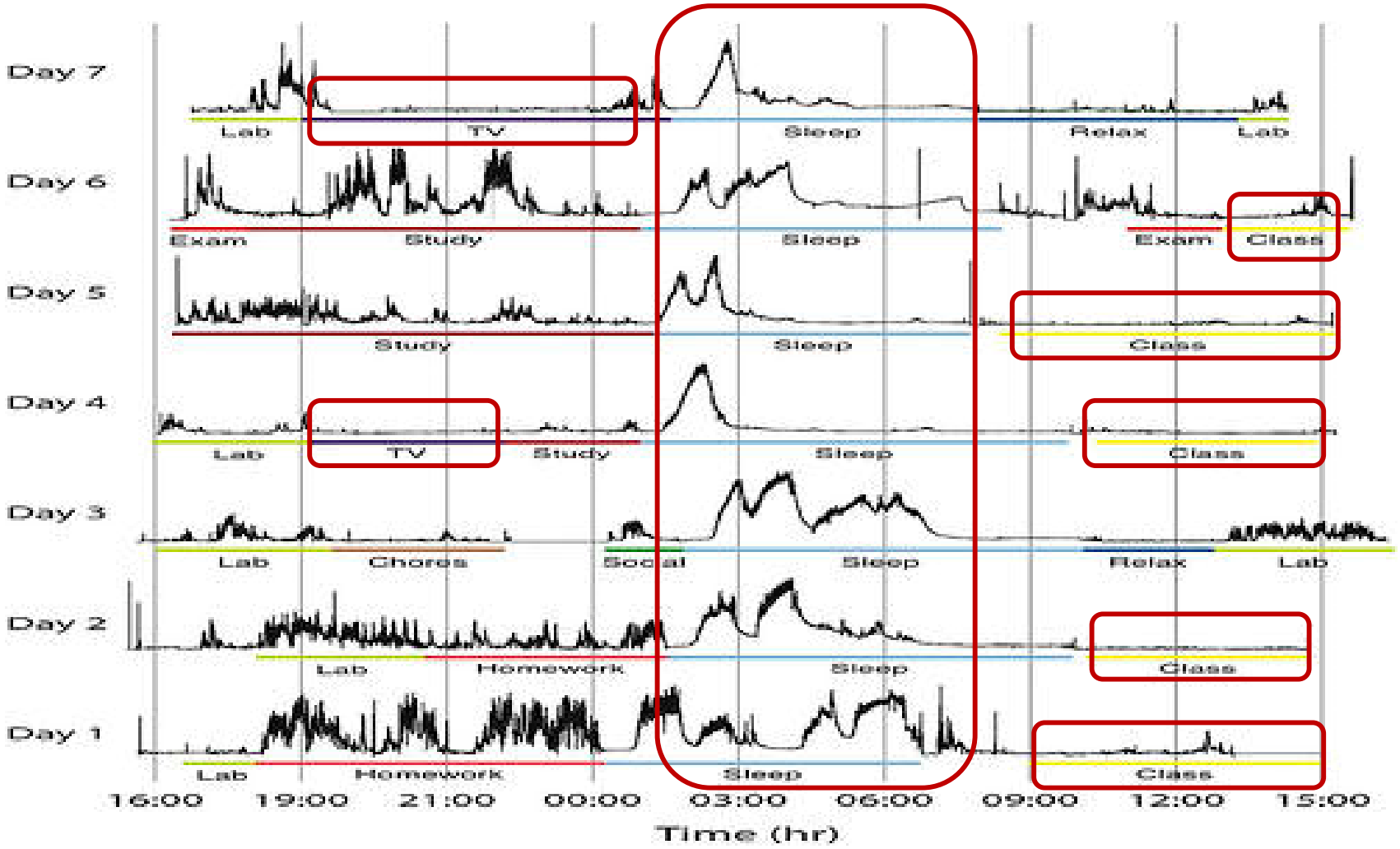
Lectures Aren't Just Boring, They're Ineffective, Too, Study Finds

12 May 2014 3:00 pm | 83 Comments

- "Students in lectures are 1.5 times more likely to fail..."
- Exam Scores: -5%

Dr. Eric Mazur

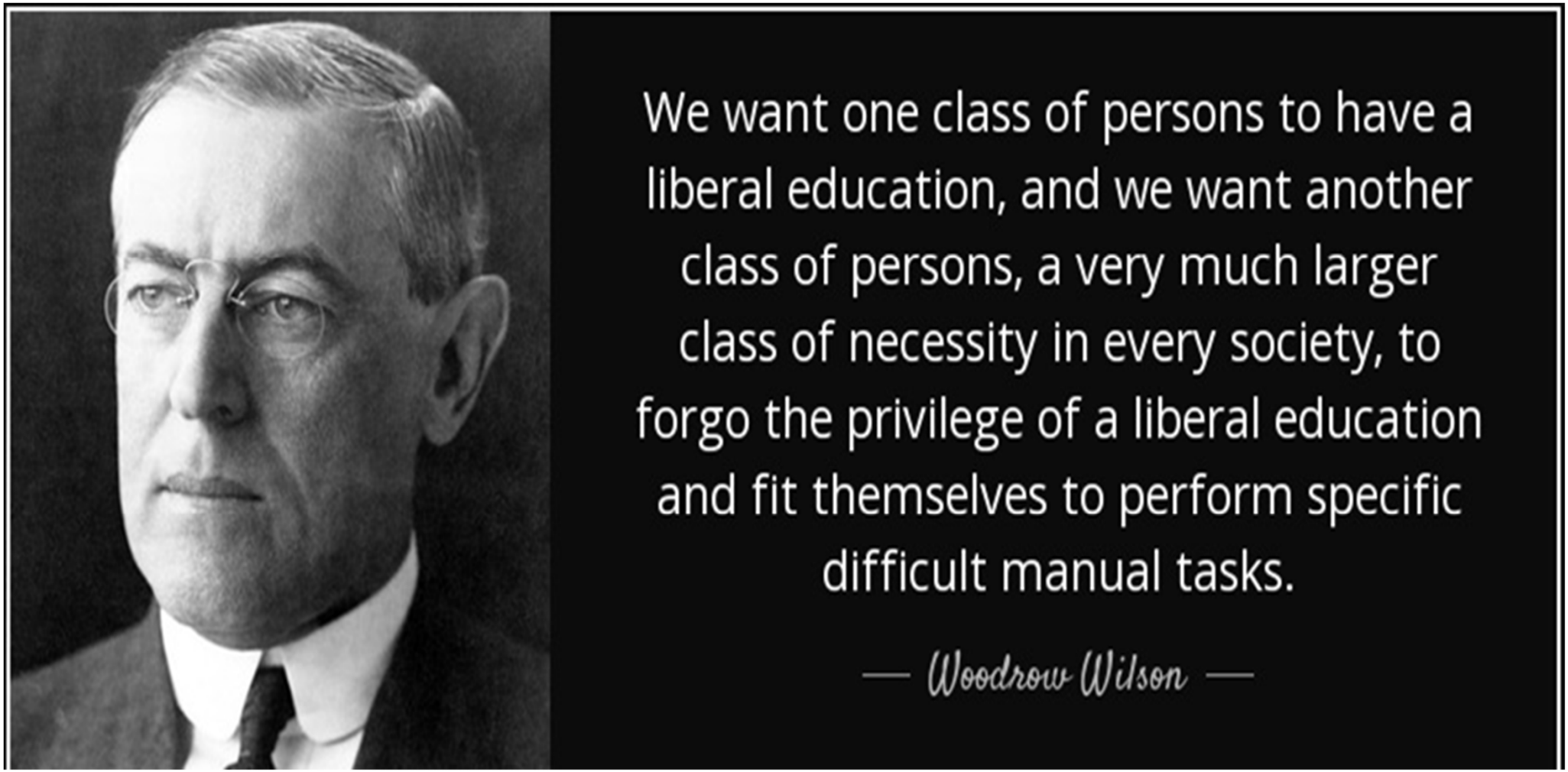
Engagement


Day 7
Lab
TV
Sleep
Relax
Lab
Day 6
Exam
Study
Sleep
Exam
Class
Day 5
Study
Sleep
Class
Day 4
Lab
TV
Study
Sleep
Class
Day 3
Lab
Chores
Social
Sleep
Relax
Lab
Day 2
Lab
Homework
Sleep
Class
Day 1
Lab
Homework
Sleep
Class
16:00
19:00
21:00
00:00
03:00
06:00
09:00
12:00
15:00
Time (hr)

Dr. George Siemens: Academic Malpractice

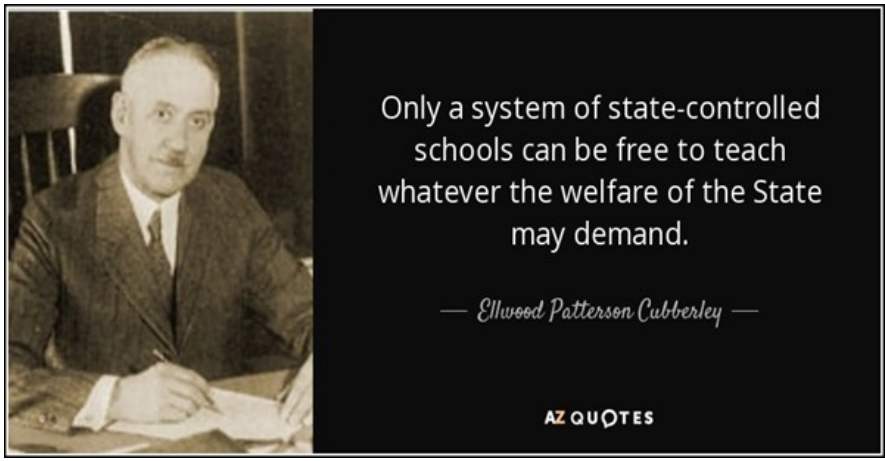
"I wonder when it will become illegal to teach by lecture. No longer worthy of the placebo effect in experiments, the mounting evidence is so clear that active learning strategies are better in every measurable way, I wonder when Do-No-Harm will be invoked in the classroom?" (2018)

Do You REALLY Want Innovation?



Social Engineering

"All focus must remain at the front for the teacher, the chalkboard, and the information, with students in rows, quietly reading books, and absorbing information, only speaking when spoken to and only taking breaks when bells ring, promoting isolation and fear will create the working class America needs." Ellwood P Cubberly - 1900



By the way...

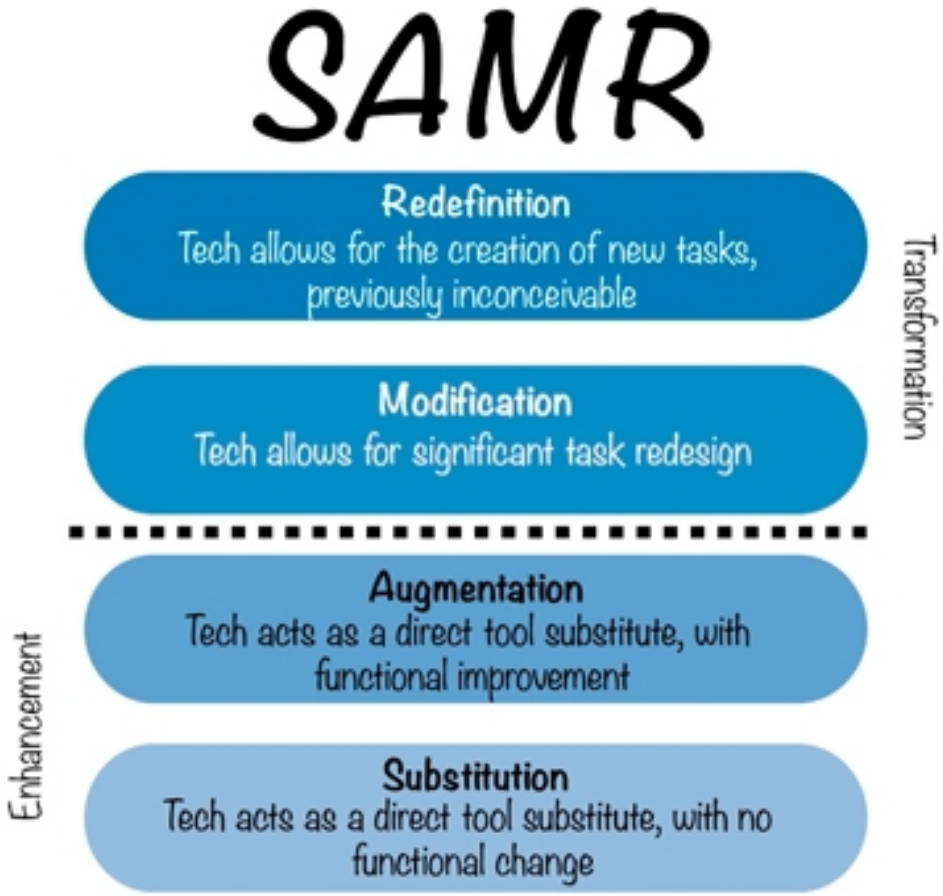
Innovation leading to transformation ≠ Technology

Innovation leading to transformation = Change Management

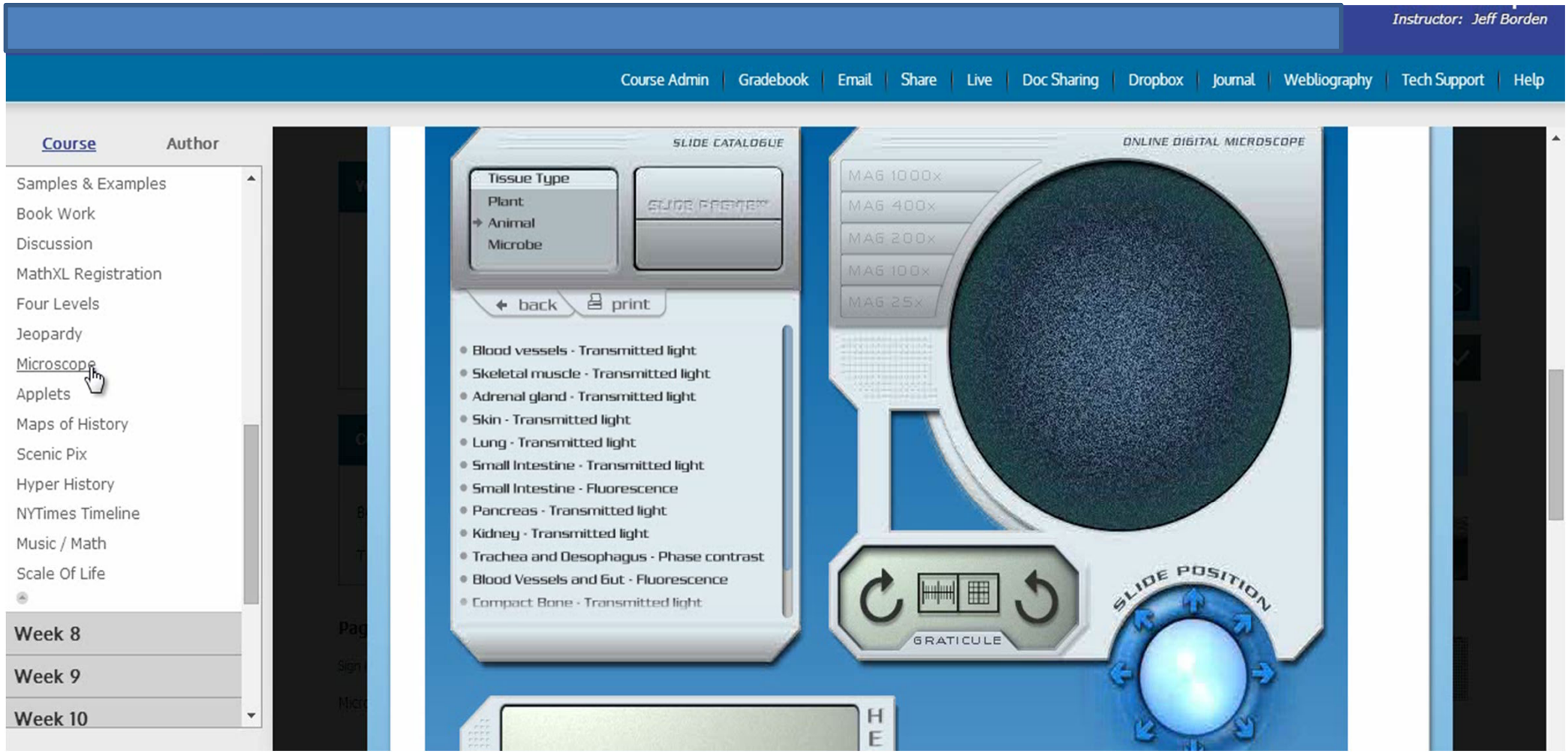
When was the last time...

- ...you attended a LEARNING conference (and not a subject matter conference)?
- ...you read more books on instruction than your discipline?
- ...a person could hear a din of noise coming from your classroom (students) and not just the sound of a single lecturer talking?
- ...you mastered the LMS and incorporated integrations with other ed tech, allowing you to do transform learning experiences for your students?

Puentedura


SAMR
Redefinition
Tech allows for the creation of new tasks, previously inconceivable
Modification
Tech allows for significant task redesign
Augmentation
Tech acts as a direct tool substitute, with functional improvement
Substitution
Tech acts as a direct tool substitute, with no functional change
Transformation
Enhancement

BBC (Open Source) Microscope

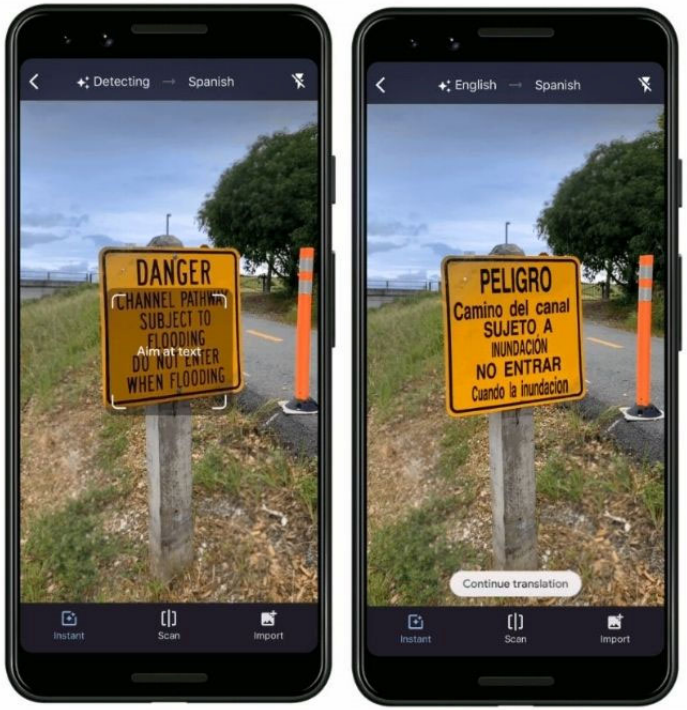


Translate This Quote

"Ninguém fala assim, mas acho que a inteligência artificial é quase uma disciplina de humanidades. To naprawdę próba zrozumienia ludzkiej inteligencji i ludzkiego poznania."

Portuguese & Polish

Sebastian Thrun on AI



"Nobody phrases it this way, but I think that artificial intelligence is almost a humanities discipline. It's really an attempt to understand human intelligence and human cognition." --The Digital Playbook

AI Interlude

https://arxiv.org/pdf/2303.12712.pdf

1. Conspiracies & Propaganda...
2. Discontinuous Tasks
3. Fermi Questions
4. Prompt Engineering
5. Theory of Mind: Ask about an upcoming interview
6. MS Co-Pilot
7. Forced Retrieval

Sparks of Artificial General Intelligence:
Early experiments with GPT-4

Sébastien Bubeck Varun Chandrasekaran Ronen Eldan Johannes Gehrke
Eric Horvitz Ece Kamar Peter Lee Yin Tat Lee Yuanzhi Li Scott Lundberg
Harsha Nori Hamid Palangi Marco Tulio Ribeiro Yi Zhang

Microsoft Research

arXiv:2303.12712v5 [cs.CL] 13 Apr 2023

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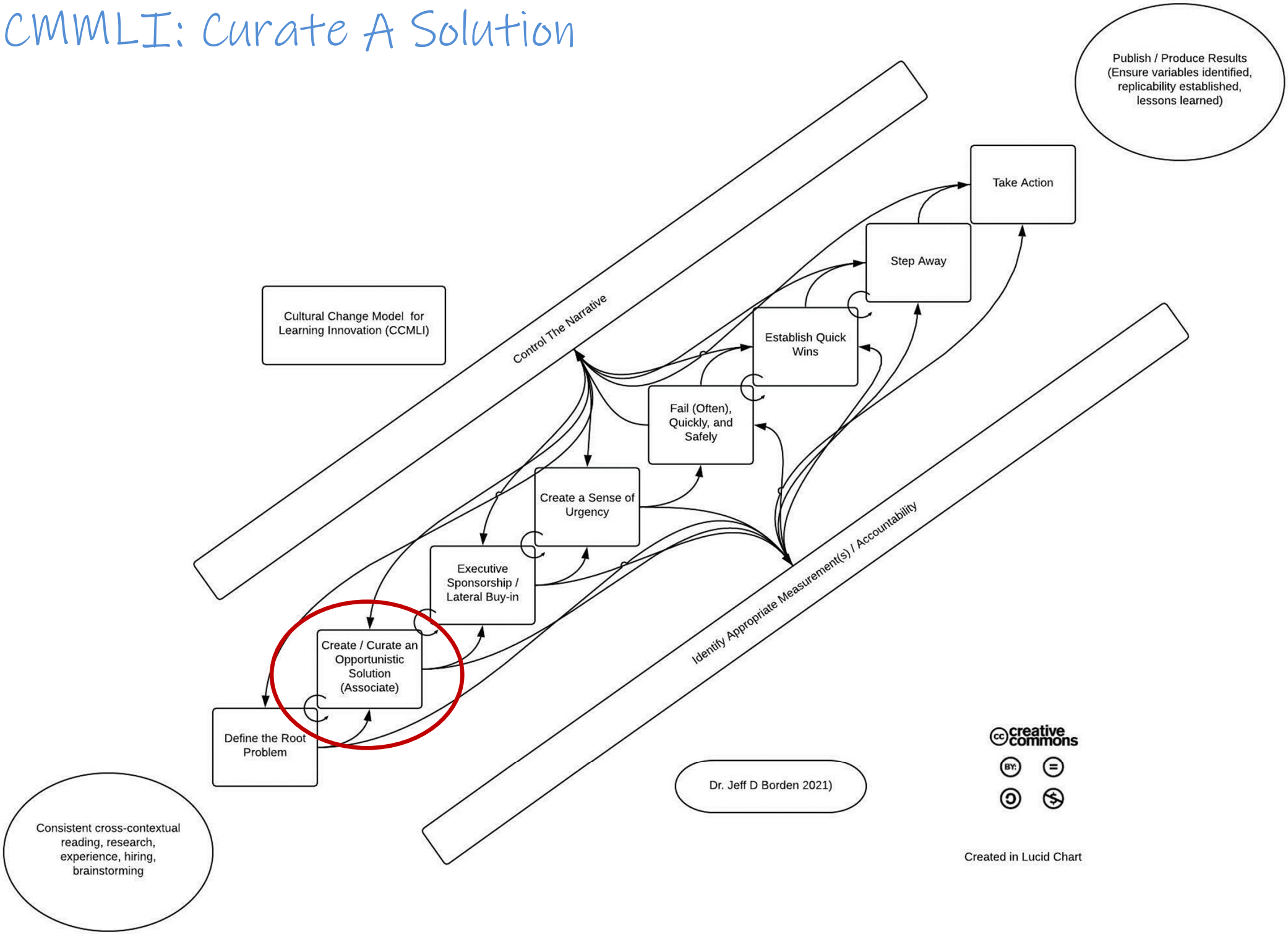
CMMLI: Curate A Solution

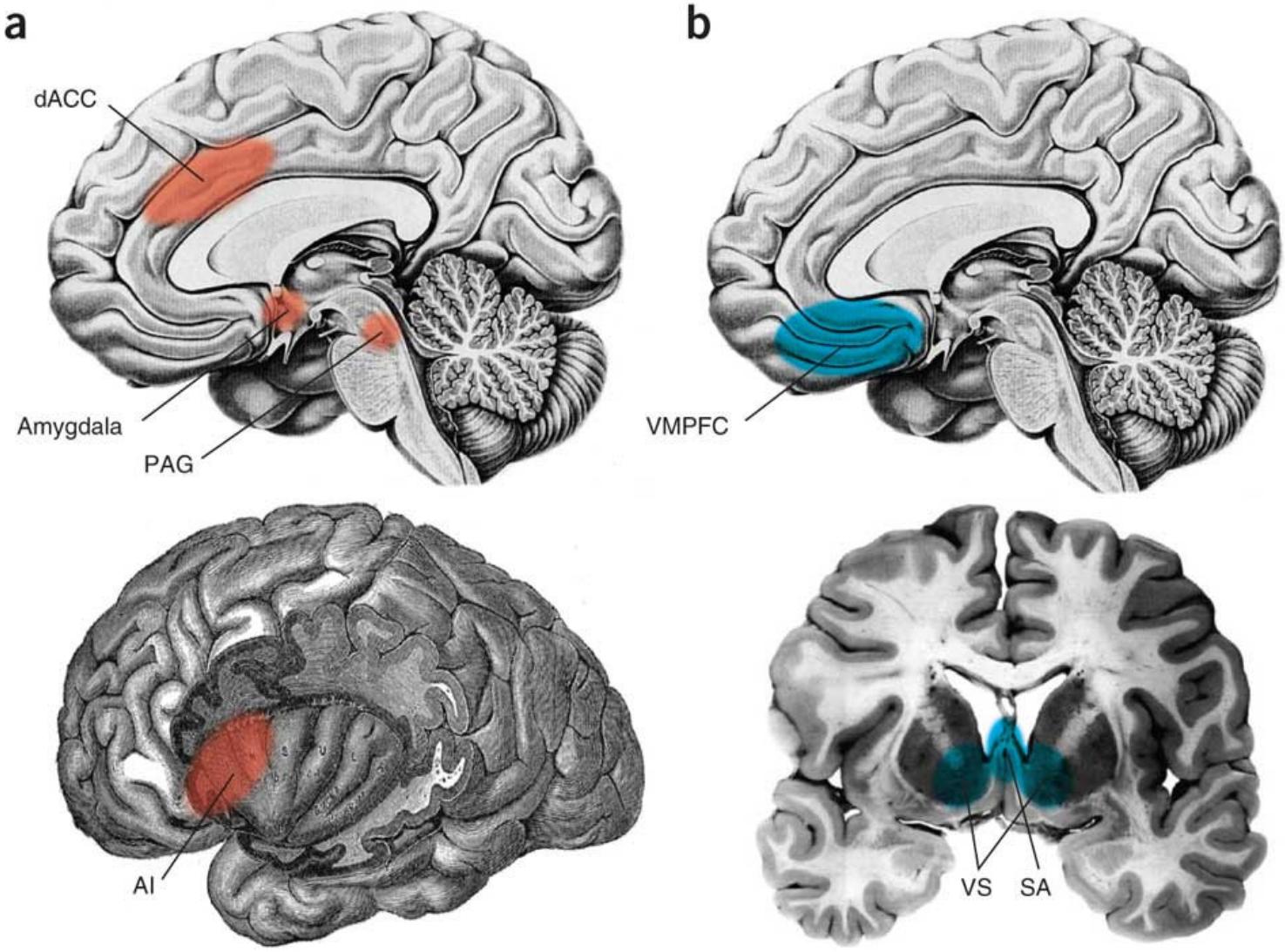


What Is?

The Learning Triangle: Holistic Learning

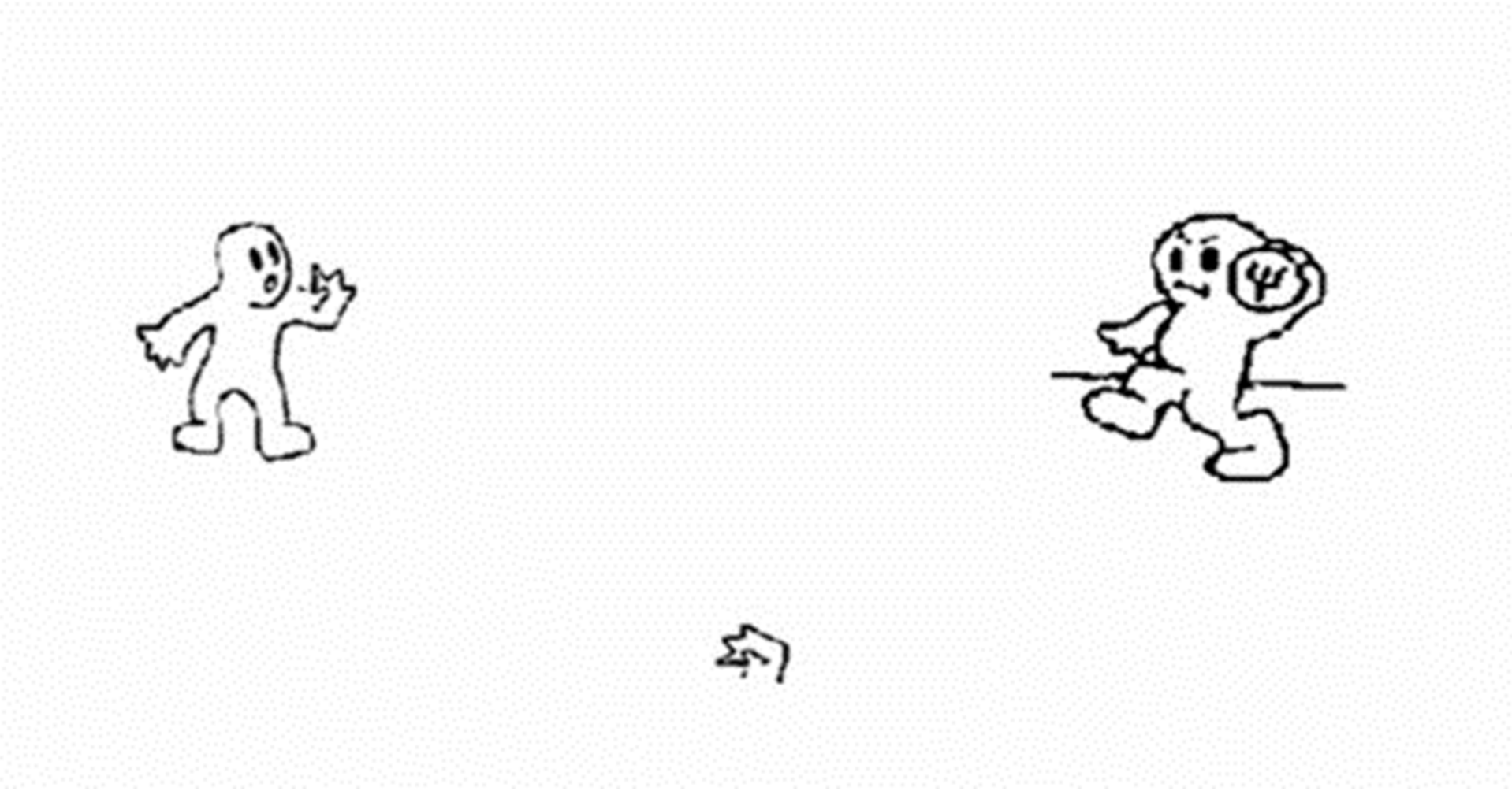
Matthew Lieberman

CONNECTED



DISCONNECTED

E-Ball



E-Ball

Social and Physical Pain

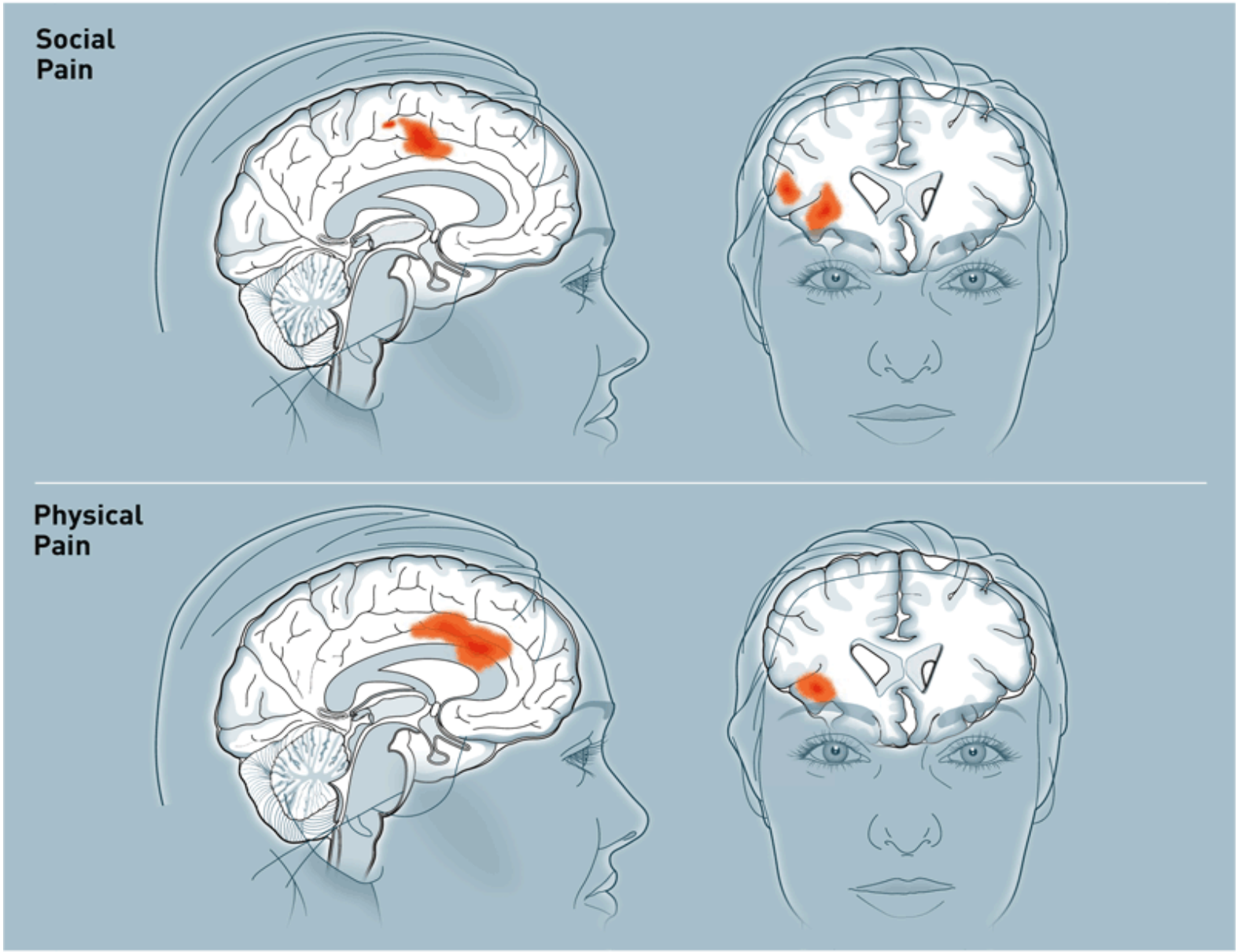


Illustration: Samuel Valasco

Source: Eisenberger, Lieberman, and Williams, *Science*, 2003 (social pain images); Lieberman et al., "The Neural Correlates of Placebo Effects: A Disruption Account," *Neuroimage*, May 2004 (physical pain images)

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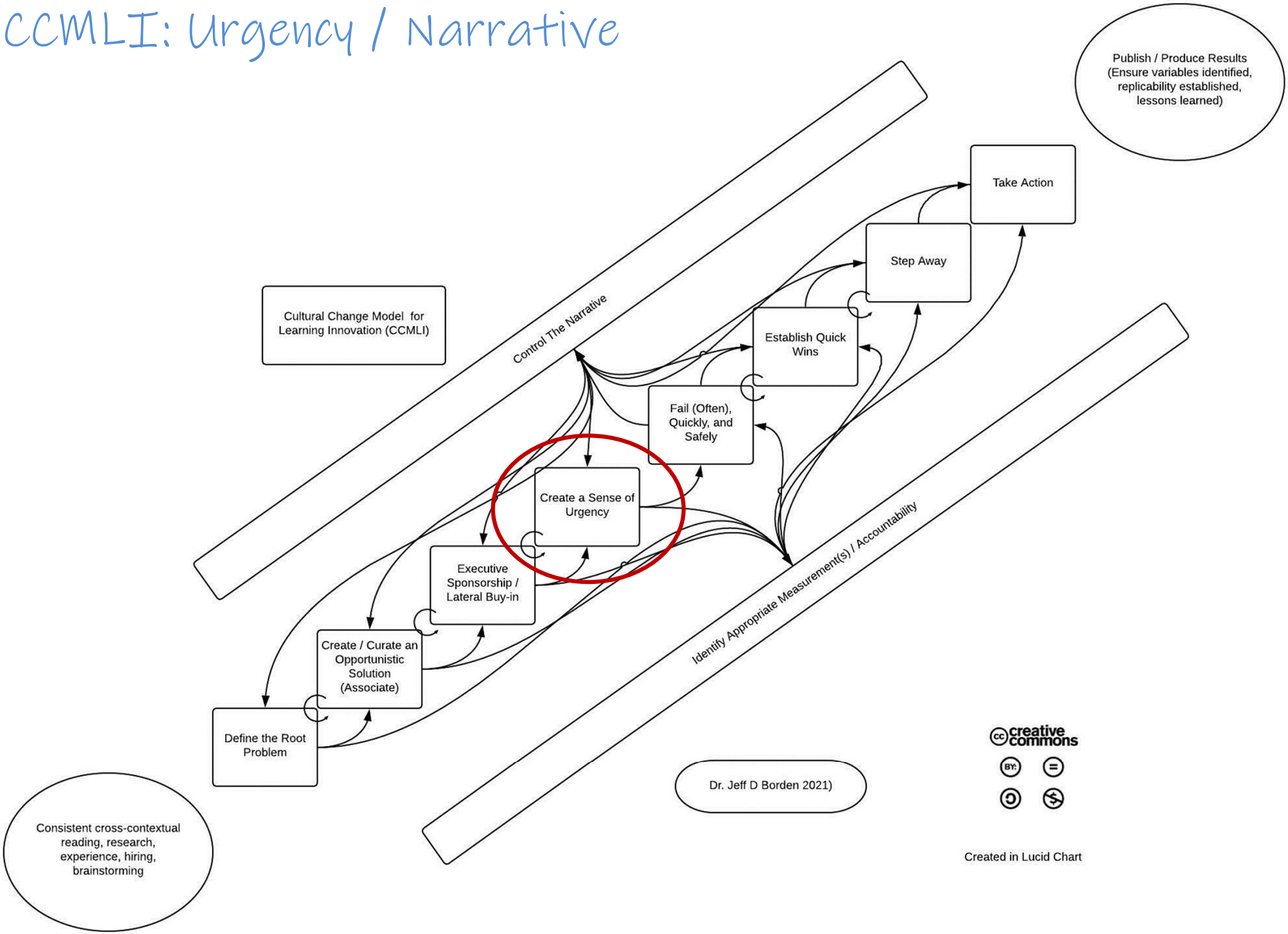
Stops Social Pain – Limits Glutamate

CCMLI: Urgency / Narrative



IBM 2010 Global CEO Survey

- *"...more than rigor, management discipline, integrity, or even vision – navigating an increasingly complex world will require innovation and creativity."*
- *80% of employers seeking creative employees cannot find them to hire...*

- 1500 CEO's from 60 Countries

Employers Expect New Job Skills

1950-2005

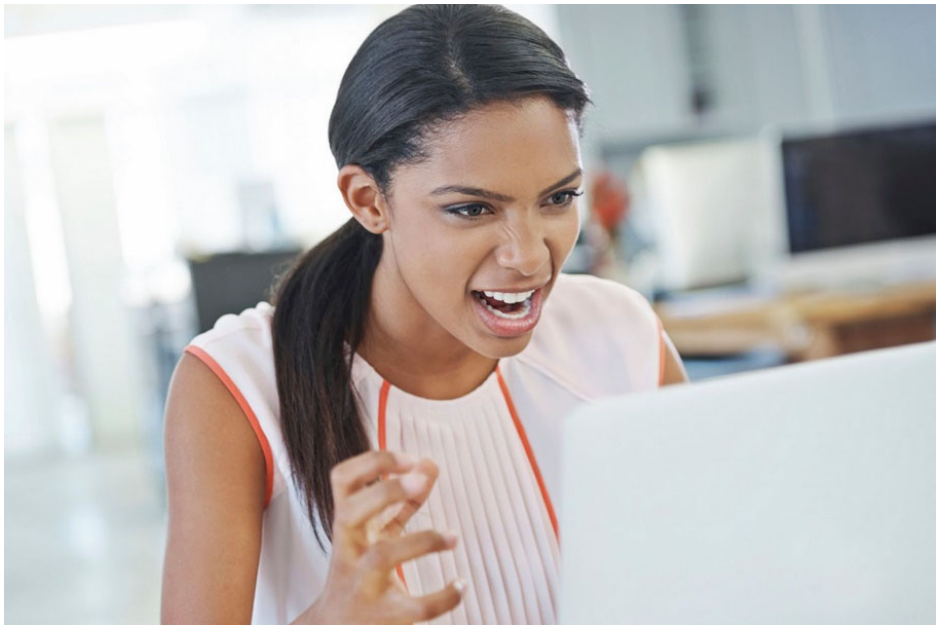
- Write effectively
- Speak effectively
- Become efficient
- Be an expert
- Loyalty
- Work ethic

2005 -

- Embrace change
- Lead
- Autonomy
- Collaborate
- Curate / Focus
- Critical Thinking
- Innovative
  - Jacob Morgan: "The Future of Work" (2014)

Change Is Exciting, Transformative, Cool

Change Sucks



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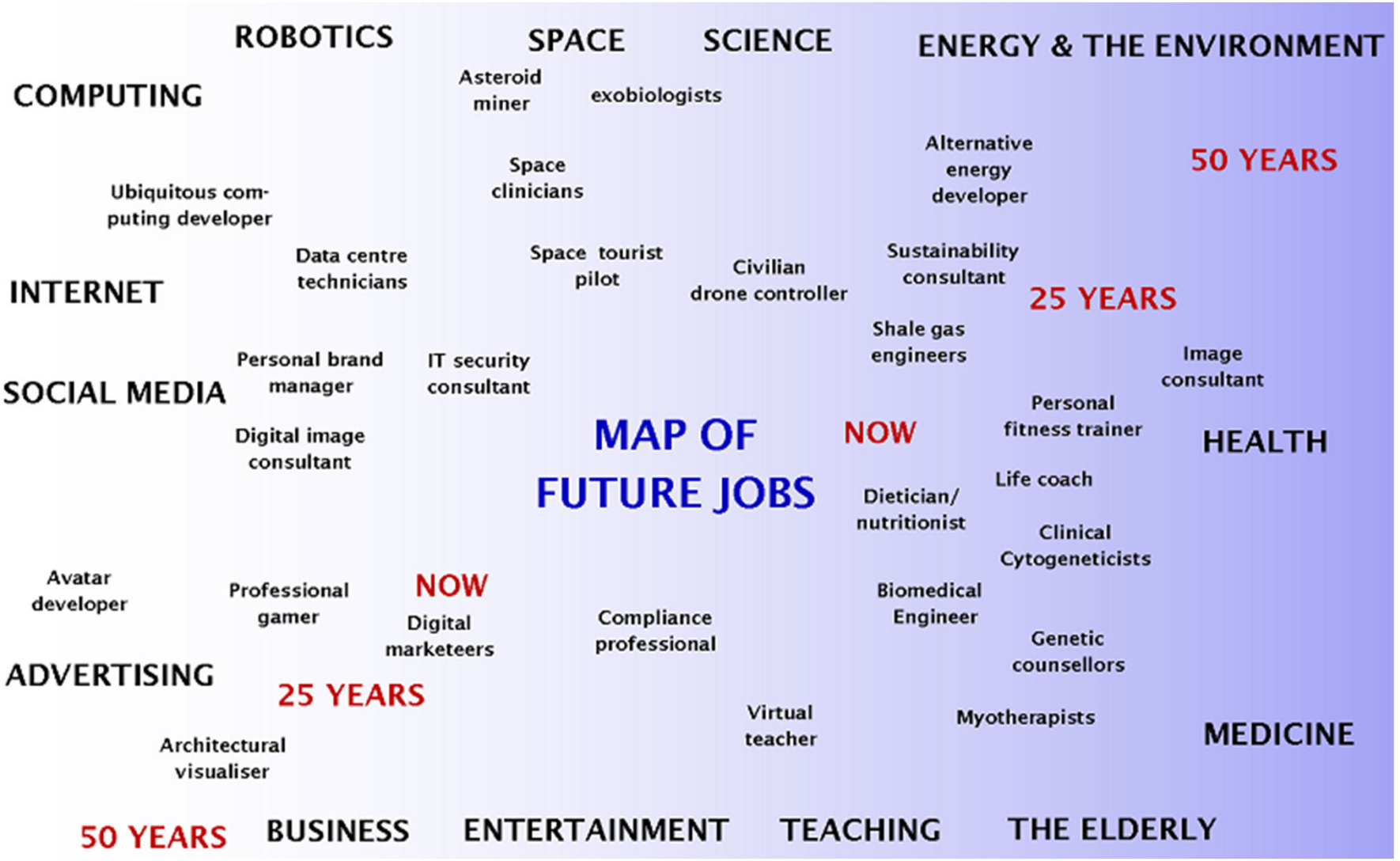
Do You Really Want Innovation?



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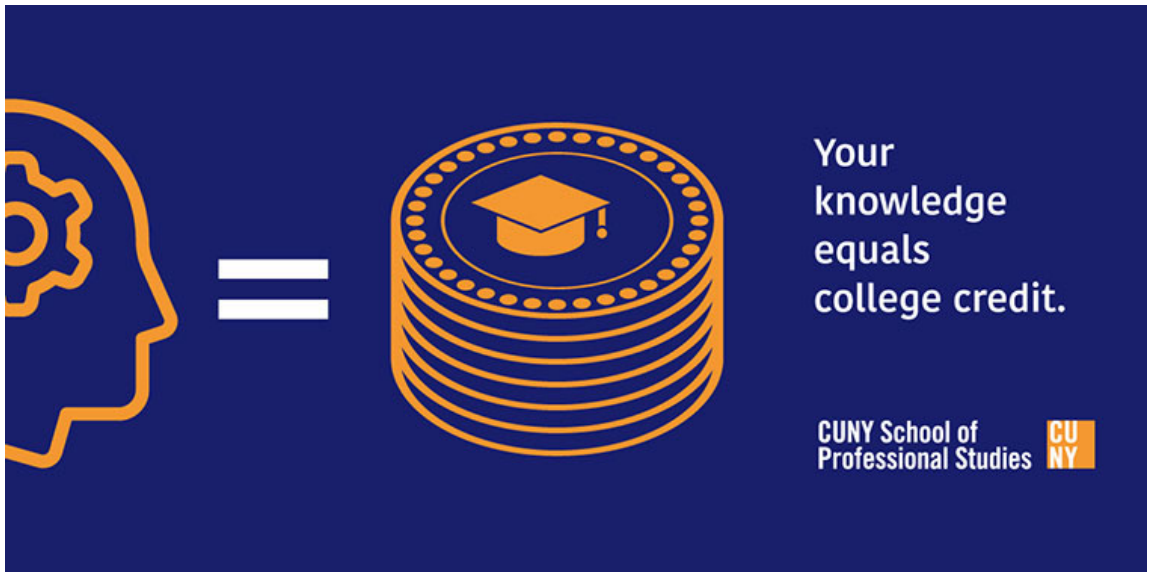
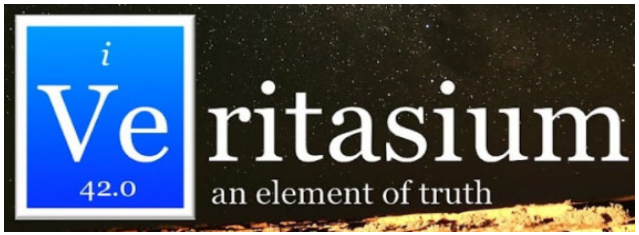
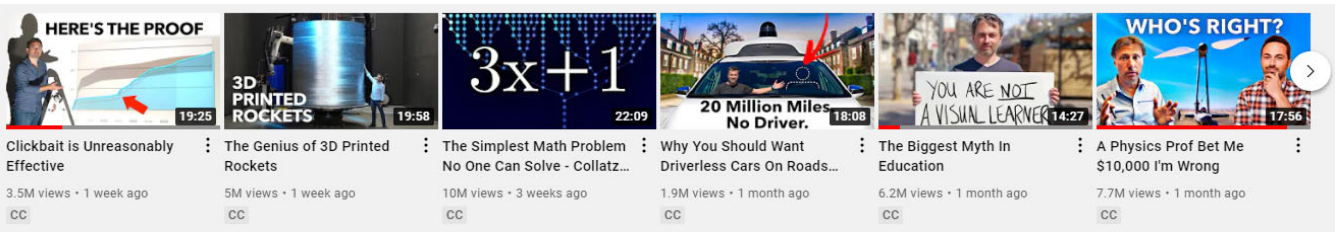
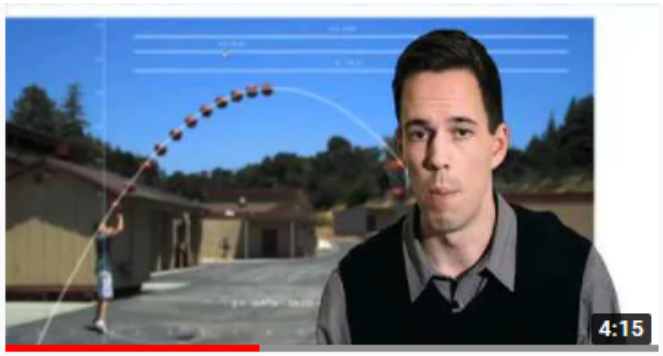
Motivate: Others Are Disrupting



Motivate: High Quality Science / Math







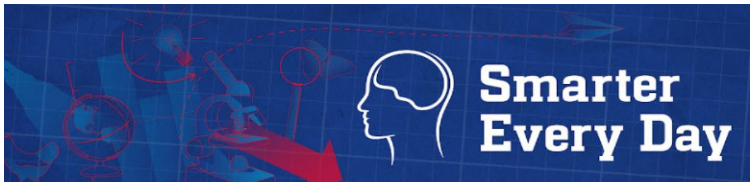
Dan Meyer on Real-World Math

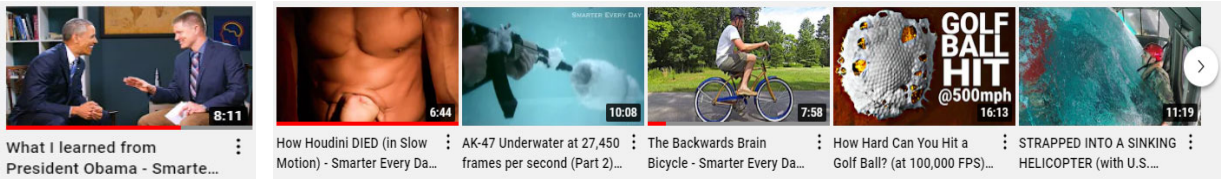
144K views • 10 years ago

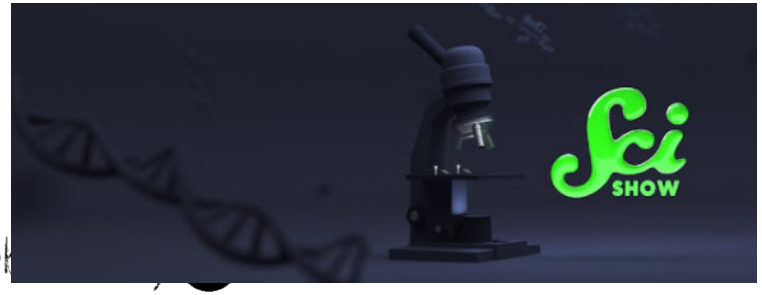
Education Week

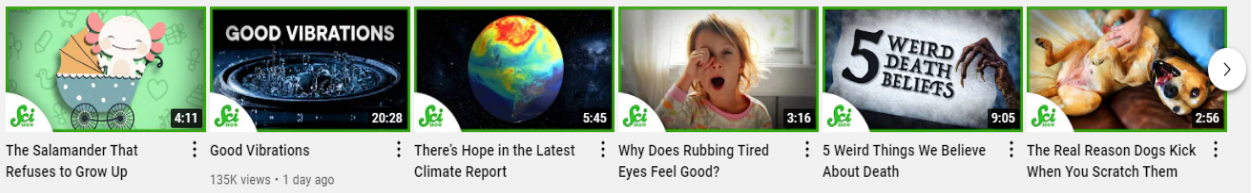
Math teacher Dan Meyer explains how presenting real-life scenarios through photos and videos makes math problems ...

CC









Motivate: The Future Is Here

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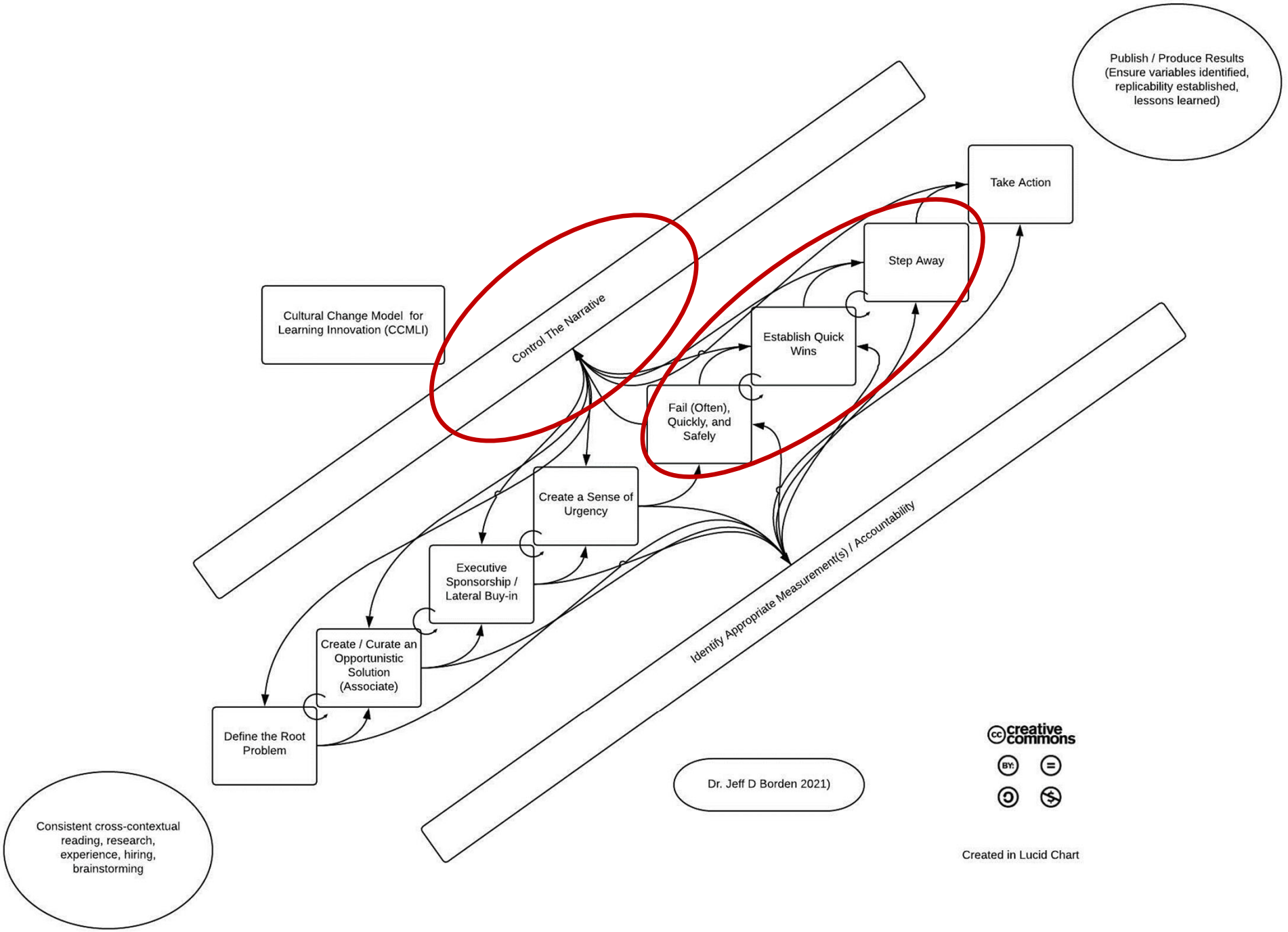

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Content is King? Which Penny Is Correct?

Nordstrom and the Returned Tire

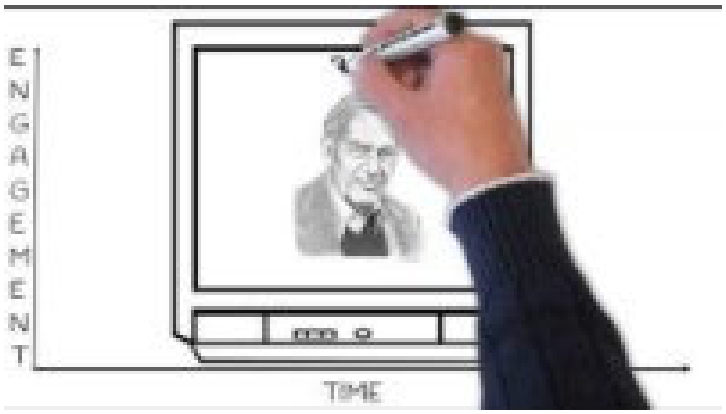
Dr John Medina

"As I was writing Brain Rules, it hit me [that] if you wanted to design a learning environment that was directly opposed to what the brain is naturally good at doing, you would design something like a classroom."

Innovation Rubric

- Does your institution bring in outside perspectives in both consultative and stakeholder capacities?
- Does your institution regularly seek root causes / problems and work to fix them?
- Does your institution create initiatives quickly and iterate to improve them or do things grind to a halt (or even die) in committee?

Thank You!



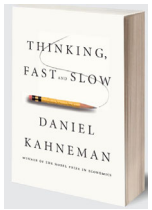
- borden@gonzaga.edu
- http://jeffpresents.com
- YouTube Videos: @bordenj71
- @bordenj (Twitter)
- LinkedIn.com/prospeaker

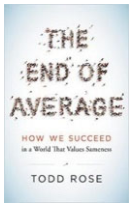
let's Connect!

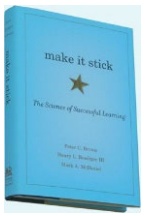
Cognition Should Cover...

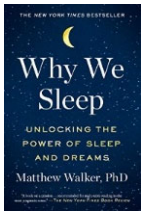
- What is Learning?
- Outcomes
- Data
- Literacy / Numeracy (across the curriculum)
- Instructional Design
- Do, Show, Tell, Review, Ask
- Blind Spots
- Averagarianism
- Associative Thinking
- Groups (Forming, Process, Accountability)
- Cognitive Load

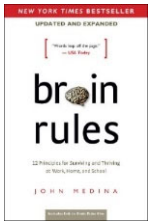
- Authentic Assessment
- Desirable Difficulties
- Bad learning neurotransmitters
- Good learning neurotransmitters
- Pattern Recognition
- Images vs Words / Text
- Generalization vs Specialization
- Transference
- Lecture vs Active Learning
- Frames & Mechanics
- Narrative
- Zone of Proximal Development

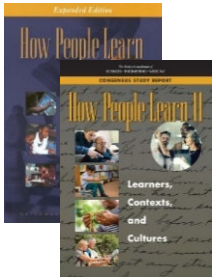


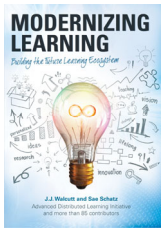


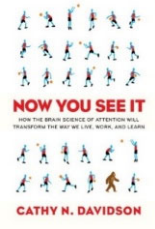


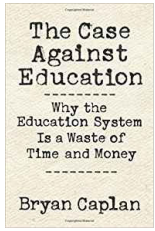


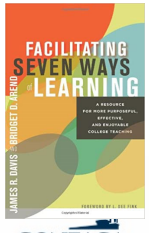












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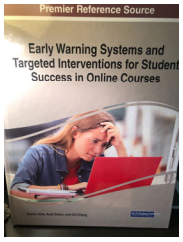
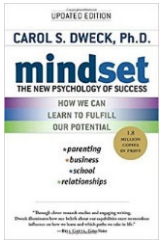
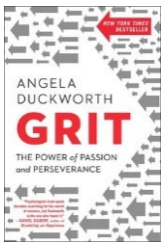
Affection / Conation Should Include...

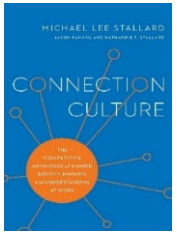
- Connection
- Caring
- Support
- Friendship
- Affinity
- Mentors
- Pride
- Systems Thinking
- Innovation

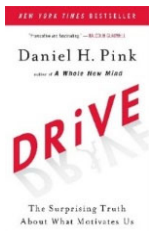
- Resilience
- Motivation
- Tenacity
- Open-Mindedness
- Self-Discipline
- Growth Mindset
- Social Intelligence
- Curiosity
- Creativity

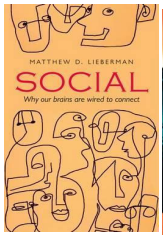


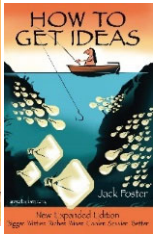


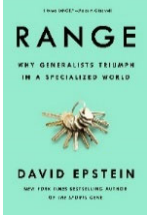


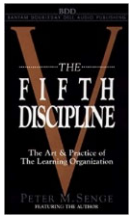


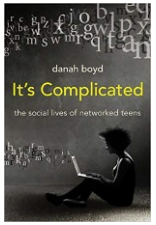


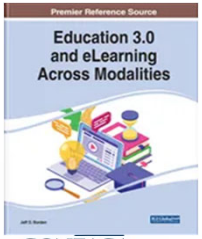












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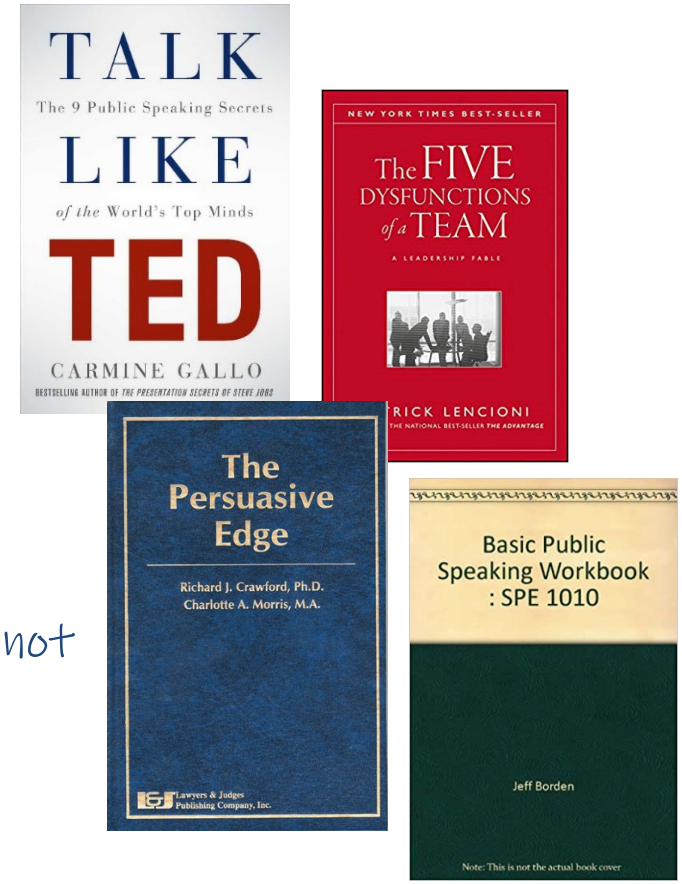
Communication Should Cover…

- Nonverbals
  - Optics
  - Objectics
    - Visual Aids
  - Proxemics
  - Haptics
  - Vocalics
  - Kinesics
  - Chronemics
- Humor
  - When and when not
- Engagement
  - Culture
- Narrative



- Persuasion
  - Monroe's Motivated Sequence
  - Aristotle's Canons of Rhetoric
- Informing
  - Credibility
  - Novelty
- Introductions
  - Attention / Focus Grabbing
  - Statement of goodwill
  - Preview / Thesis

Teach Better: Good Follows

- Phil Hill
- George Siemens
- Jeffrey Selingo
- Jackie Gerstein
- Larry Ferlazzo
- Dan Meyer
- Derek Muller
- Geoff Leigh
- Emma Zone
- Cristi Ford
- Rob Letcher
- D2L
- e-literate
- WCET
- OLC
- Educause
- THE (Times Higher Ed)
- ProfHacker
- Ed Biz
- Eduventures
- TheAtlanticEducation
- Institute for Inter-Connected Education

Teach Better: Recommended Reading

- Borden, J. (2020). Non-Cognitive Signals and Systems: The Science and Technology of Connectedness. Chapter from Edited Book in Early Warning Systems and Targeted Interventions for Student Success in Online Courses (Glick, et.al.). IGI Publishing.
- Borden, J. (2020). The Science and Technology of Educational Interconnectedness. Chapter from Edited Book in International Perspectives on the Role of Technology in Humanizing Higher Education (Blessinger, et.al.). HETL Publishing.
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