

THE ENTERPRISE

Matthew A. Cronin
George Mason University

Lots of other people
Lots of other universities

I AM WORRIED ABOUT THE PROFESSION

Once upon a time, there was an activity called scientific research and the performers of this activity were called scientists. In reality, however, they were builders who constructed edifices, called explanations or laws, by assembling bricks, called facts....

The brickmakers became obsessed with the making of bricks. When reminded that the ultimate goal was edifices, not bricks, they replied that, if enough bricks were available, the builders would be able to select what was necessary and still continue to construct edifices....

And so it happened that the land became flooded with bricks. It became necessary to organize more and more storage places, called journals, and more and more elaborate systems of bookkeeping to record the inventory....

It became difficult to find the proper bricks for a task because one had to hunt among so many. It became difficult to find a suitable plot for construction of an edifice because the ground was covered with loose bricks. It became difficult to complete a useful edifice because, as soon as the foundations were discernible, they were buried under an avalanche of random bricks. And, saddest of all, sometimes no effort was made even to maintain the distinction between a pile of bricks and a true edifice.

ITS NOT JUST PRODUCTION, ITS ALSO DISSEMINATION

MANAGEMENT | ON THE CLOCK

Office Brainstorms Are a Waste of Time

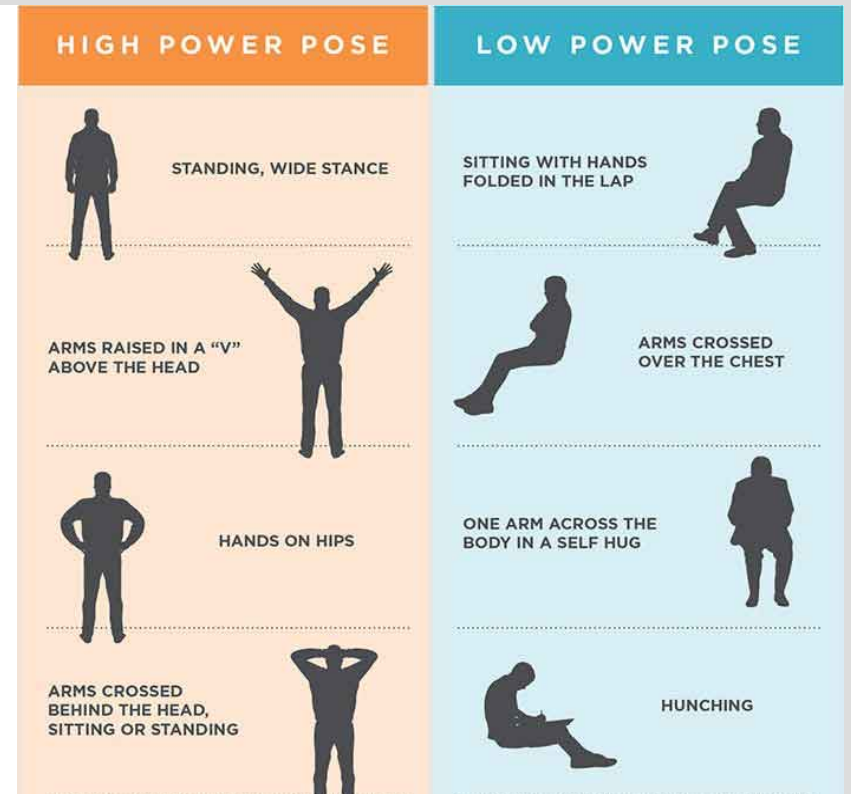
Giving workers alone time could yield more innovation than getting everyone in a room, research shows



By [Callum Borchers](#) [Follow](#)

Updated May 18, 2023 1:11 pm ET

<https://www.wsj.com/articles/cacel-that-brainstorm-theres-a-better-way-to-spur-good-ideas-f3c462d3n>

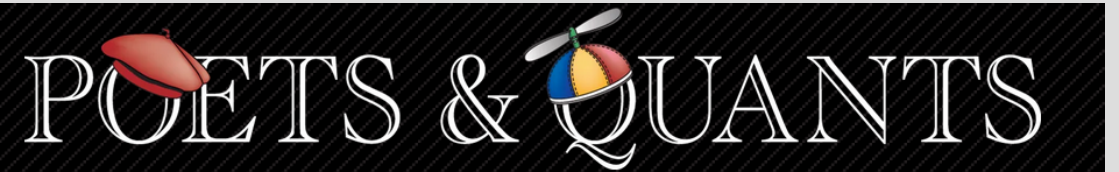


AND IT SEEMS TO BE GETTING WORSE

**'The situation has become appalling':
fake scientific papers push research
credibility to crisis point**

**Last year, 10,000 sham papers had to be retracted by academic
journals, but experts think this is just the tip of the iceberg**

<https://www.theguardian.com/science/2024/feb/03/the-situation-has-become-appalling-fake-scientific-papers-push-research-credibility-to-crisis-point>



[MAIN MENU](#) [MOST RECENT](#) [THIS WEEK'S MOST VIEWED](#) [VIDEOS](#) [PODCASTS](#) [EVENTS](#) [SPECIAL](#)

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GMAC Survey: Global B-School Applications Dropped 5% In 2023

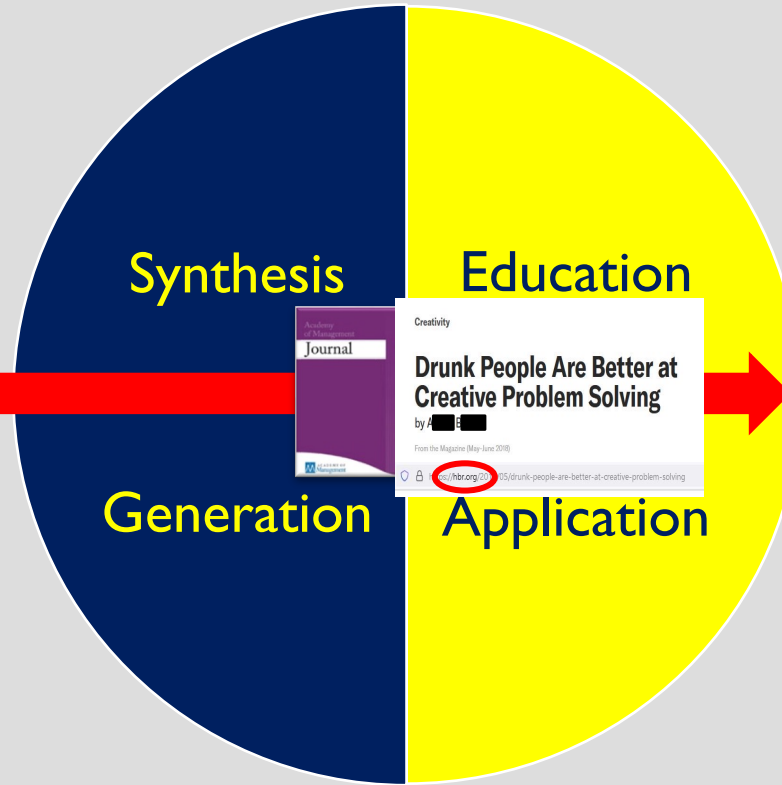
BY: KRISTY BLEIZEFFER ON OCTOBER 27, 2023 | [0 COMMENTS](#) | [3,149 VIEWS](#)

CURRENT FIXES CREATE OTHER PROBLEMS

62% of studies replicate
Mean effect size is 50%
of original (*Evaluating the replicability of social science experiments in Nature and Science between 2010 and 2015*)

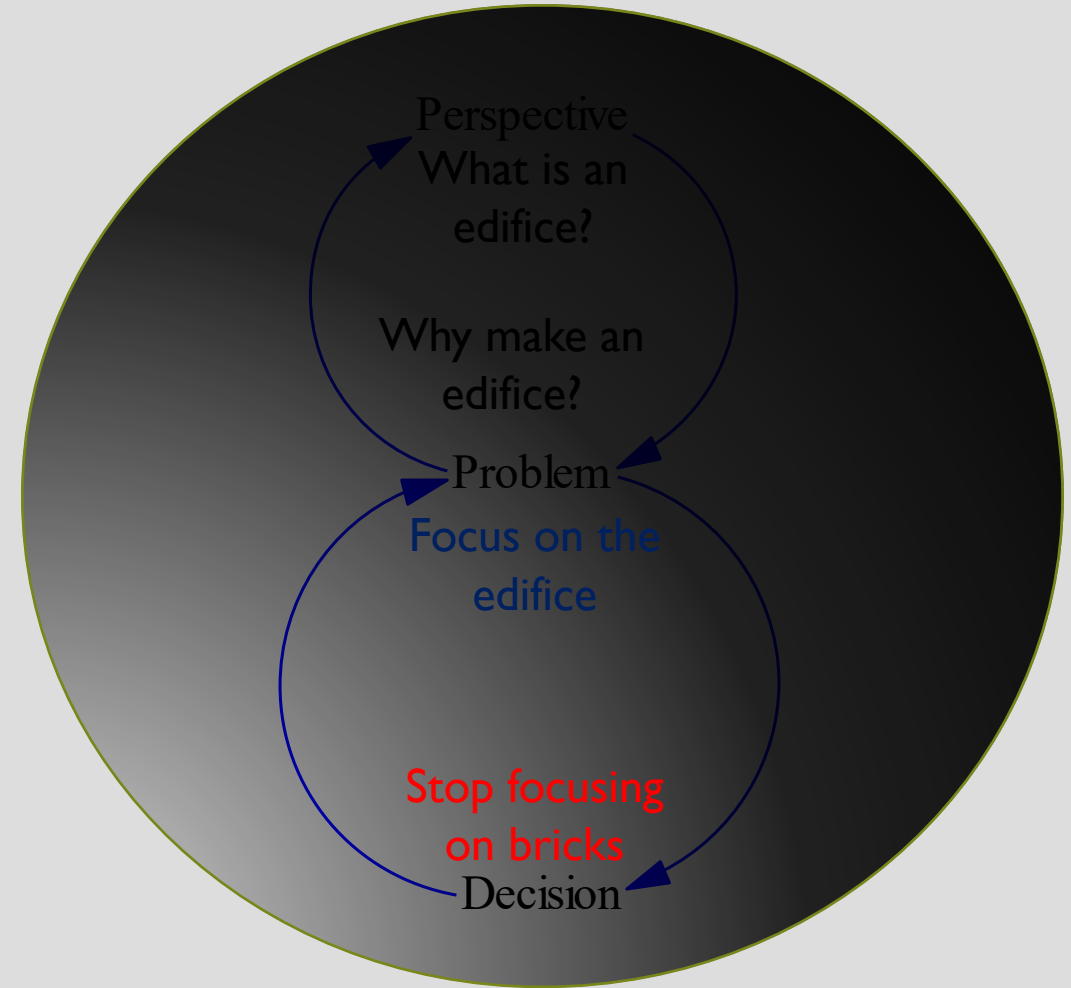
Production

No one is reading our work!
Produce more of it!



Dissemination

ITS BECAUSE WE HAVE THE WRONG PERSPECTIVE ON OUR PROFESSION



I AM FOCUSING ON OUR PROFESSION: ALL THOSE WHO STUDY AND TEACH ABOUT MANAGEMENT AND ORGANIZATIONS

- Professions have the following:
 - A solid theoretical foundation
 - Authority
 - Connection to a broader community
 - A code of ethics
 - A positive culture
- How are we doing on these?
- I am absolutely not trying to say “we suck” – I am trying to say we could be so much better
- I am trying to say that we have grave danger ahead if we do not change our course
 - We need a **system level** change
 - Change of course is not a single, simple, or quick fix

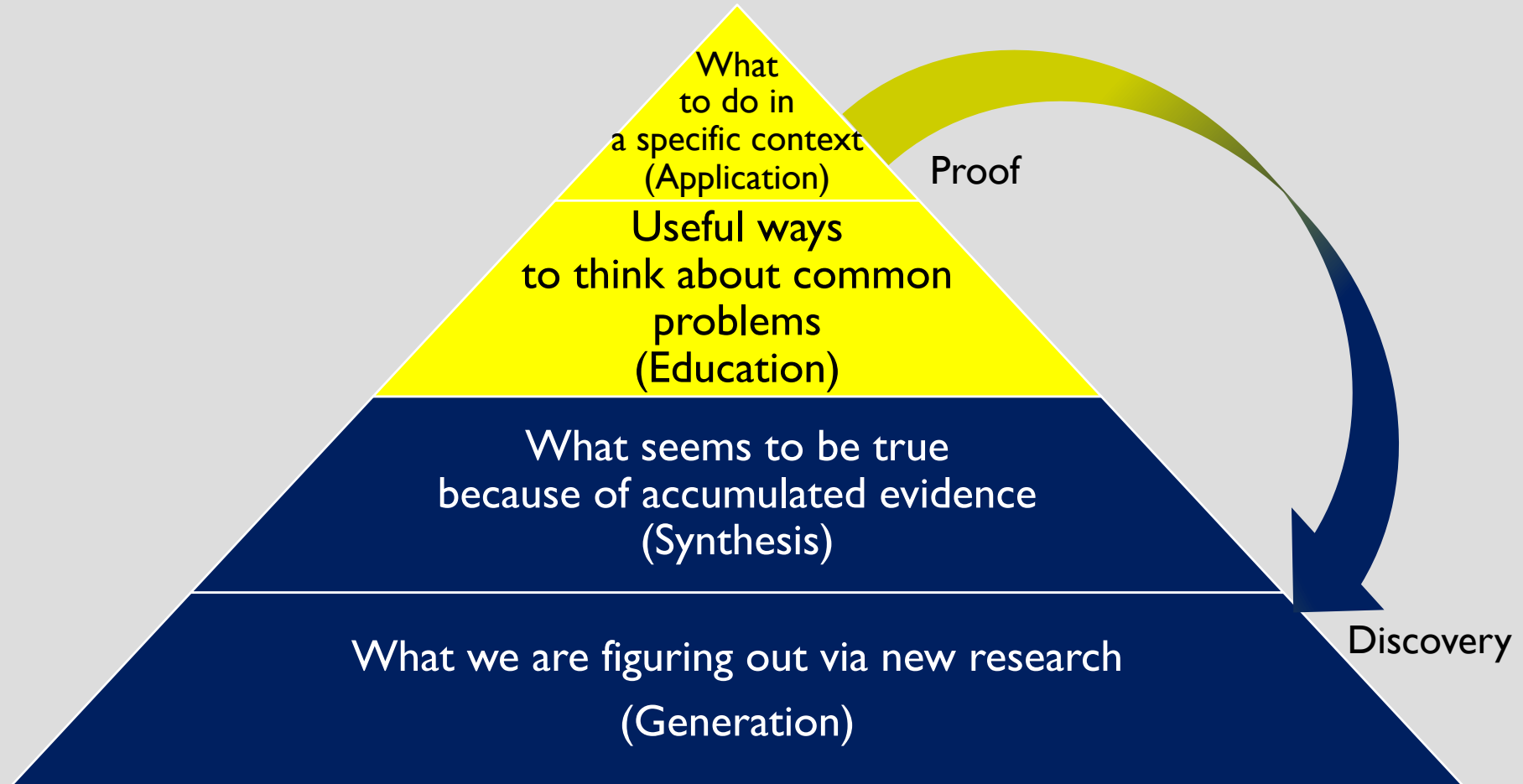
A REASON TO CHANGE

- Organizational **science** matters
 - Science is slow, careful, cumulative, and collaborative
 - You must not fool yourself, and you are the easiest to fool (R. Feynman)
 - Three professions don robes... (J.Walsh)
- **Organizational** science matters
 - Organizations affect everything in a society
 - Organizations run (or do not) depending on how they are managed
 - We *are* saving lives, but I'd also like fewer meetings

THE MARKETPLACE FOR IDEAS

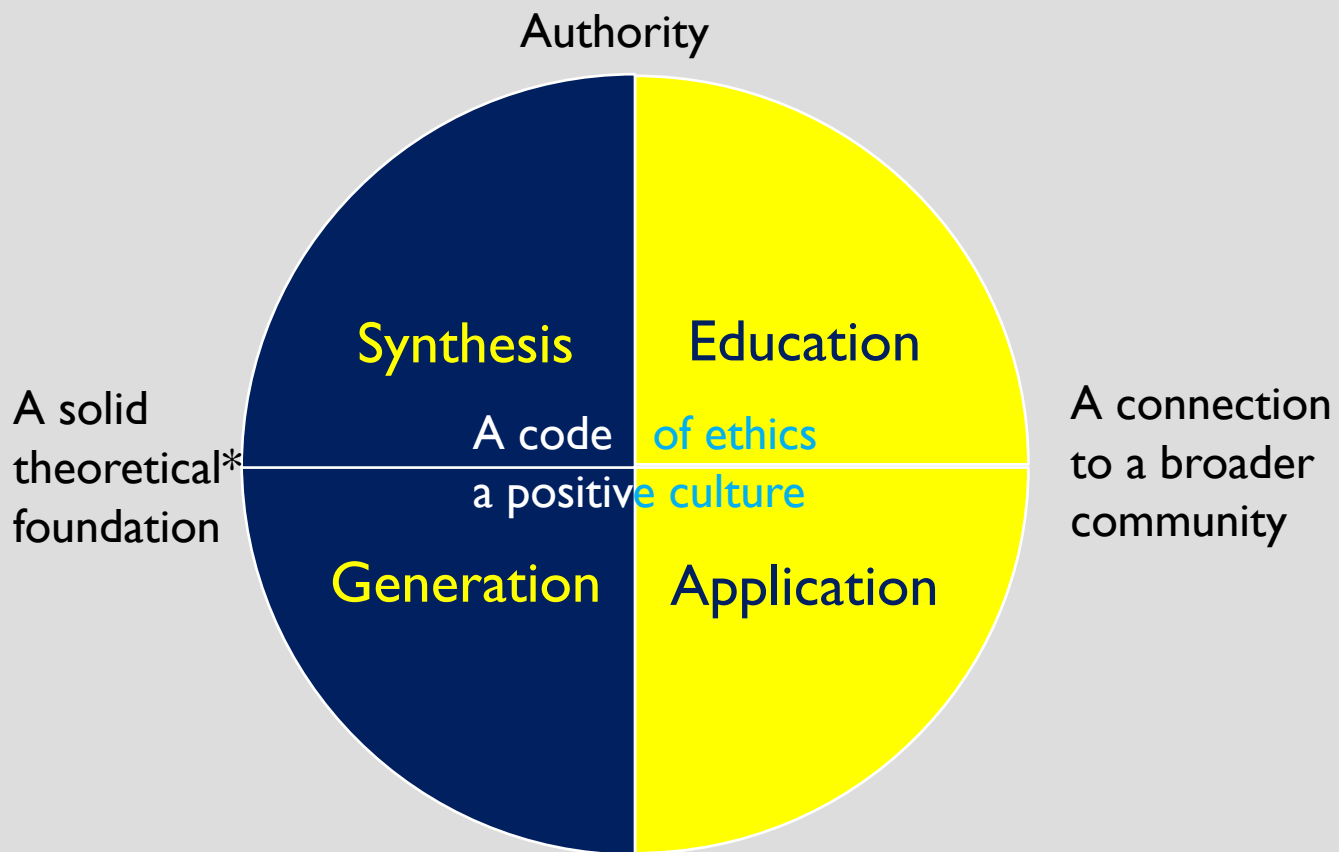
The root of the problem

WHAT TO DO DEPENDS ON HOW YOU THINK
HOW TO THINK DEPENDS ON WHAT IS JUSTIFIED



THESE FUNCTIONS ARE THE ESSENCE OF
OUR PROFESSION

**Production
(Research)**



**Dissemination
(Teaching)**

THEY ARE INTERCONNECTED



Synthesis



Education



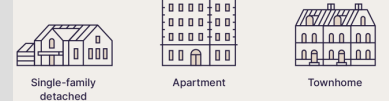
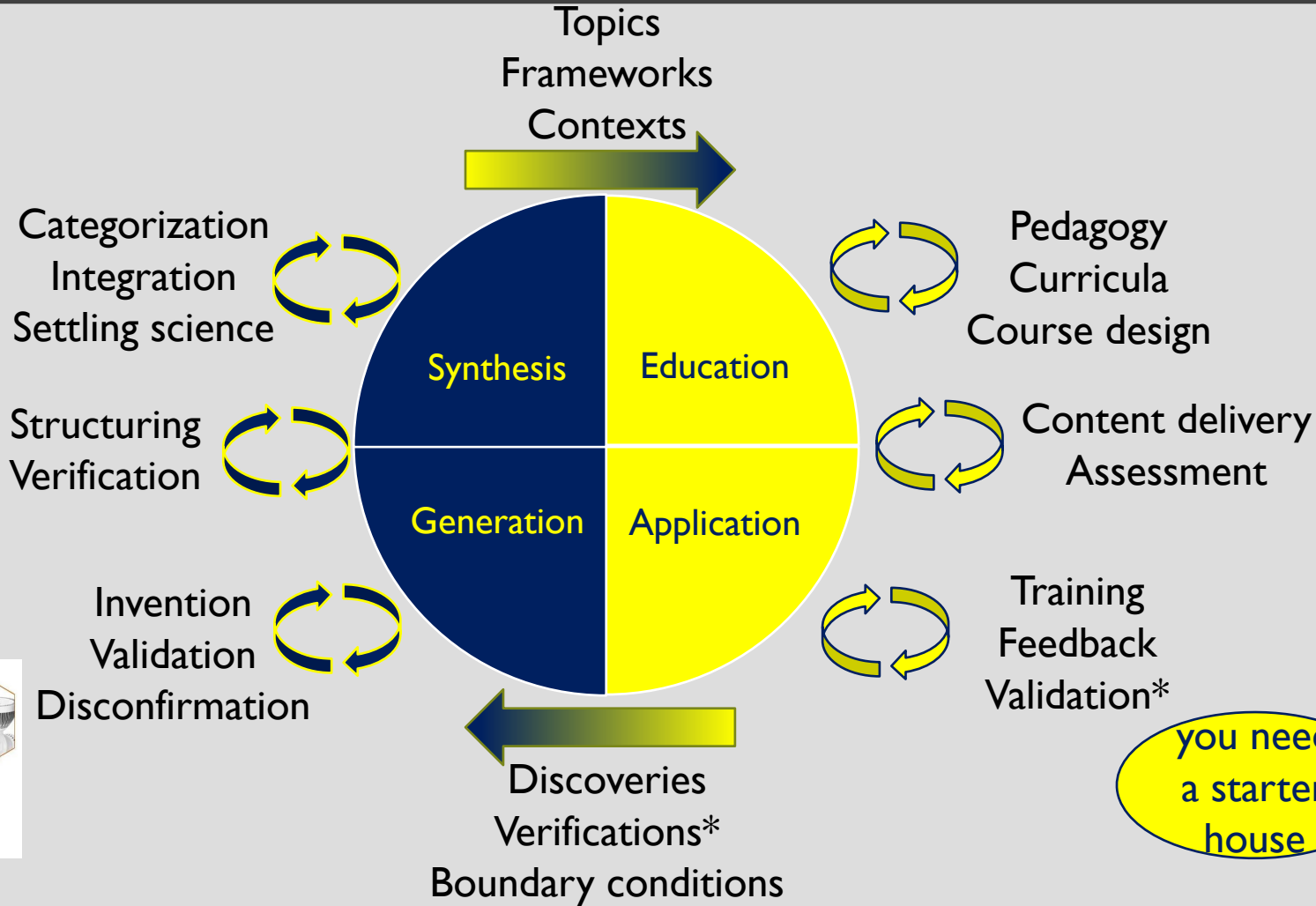
Generation



Application



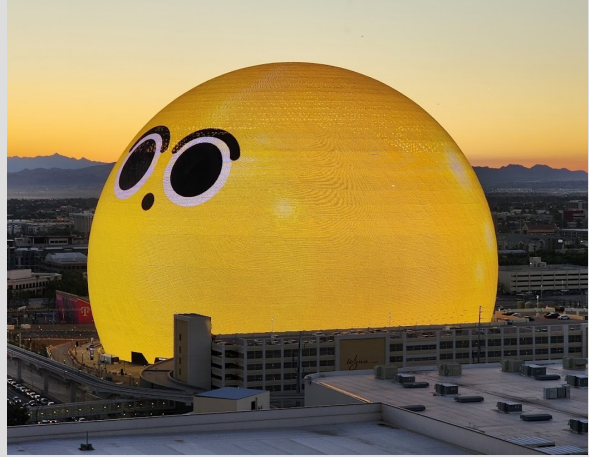
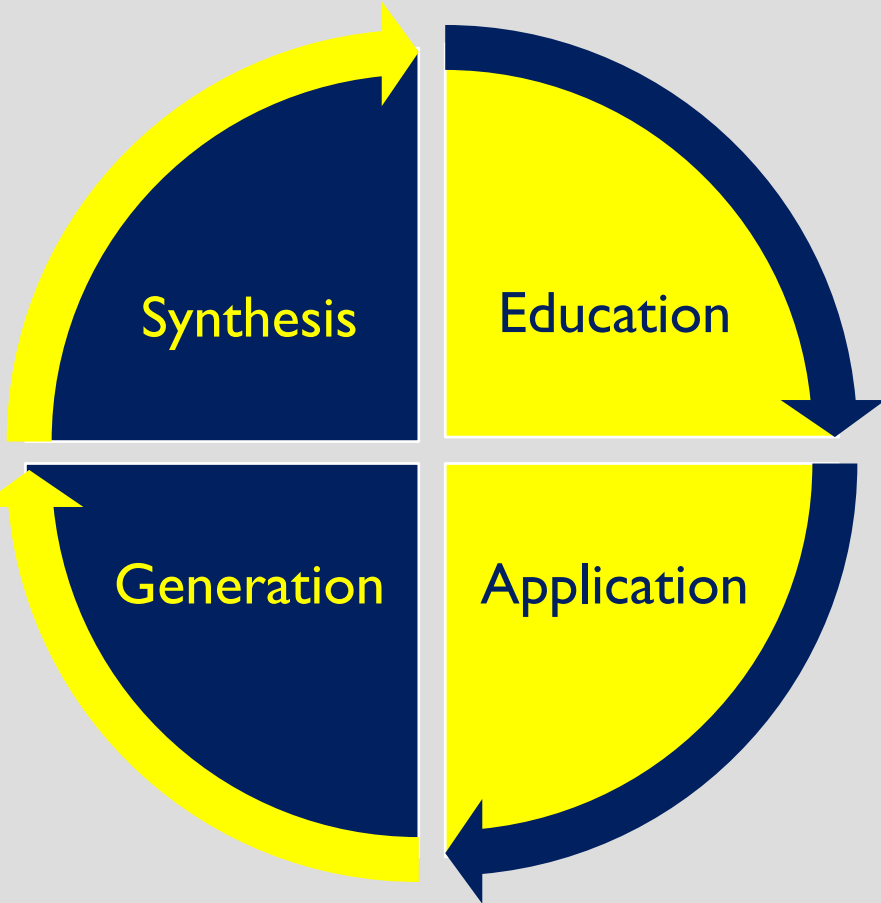
THE (SUB)FUNCTIONS MUST WORK TOGETHER AND THERE ARE MANY



you need a starter house



SPECIALIZATION AND COORDINATION IS HOW WE SCALE, BUT THAT IS NOT OUR MODEL



Stereographic Projection

$$(R, \theta) = \left(\frac{\sin \phi}{1 - \cos \phi}, \theta \right) = \left(\cot \frac{\phi}{2}, \theta \right)$$

$$(\phi, \theta) = \left(2 \arctan \frac{1}{R}, \theta \right)$$

Snell's Law

$$\frac{\sin \theta_2}{\sin \theta_1} = \frac{v_2}{v_1} = \frac{n_1}{n_2}$$

Finite Element Method

$$(-k\nabla T) \cdot n = h(T - T_{amb}) \text{ on } \partial\Omega_2$$

Fanger's Equation

$$L = q_{met, heat}$$

$$-f_{cl} h_c (T_{cl} - T_a)$$

$$-f_{cl} h_r (T_{cl} - T_r)$$

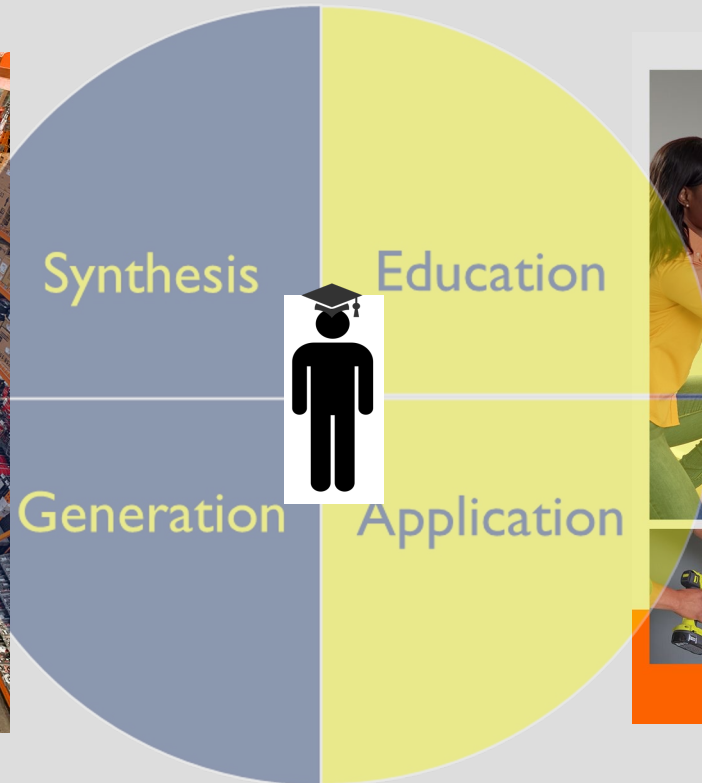
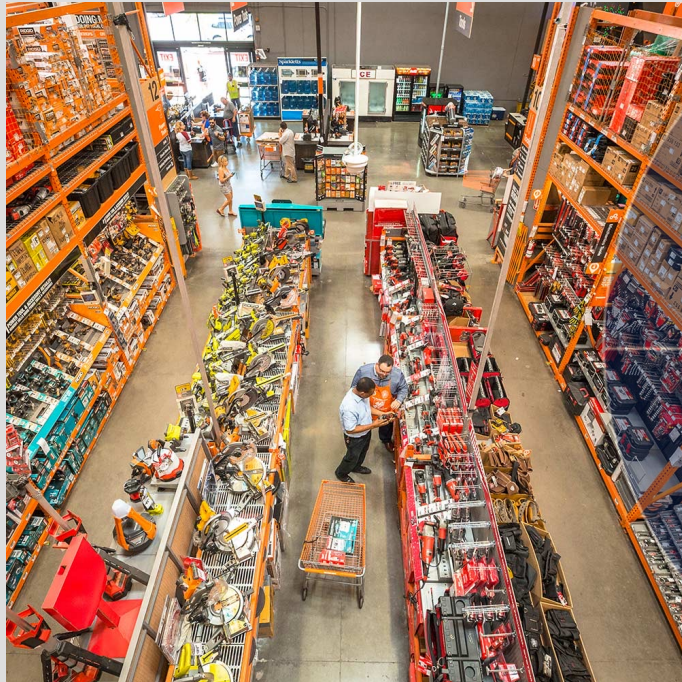
$$-156 (W_{sk, req} - W_a)$$

$$-0.42 (q_{met, heat} - 18.43)$$

$$-0.00077M (93.2 - T_a)$$

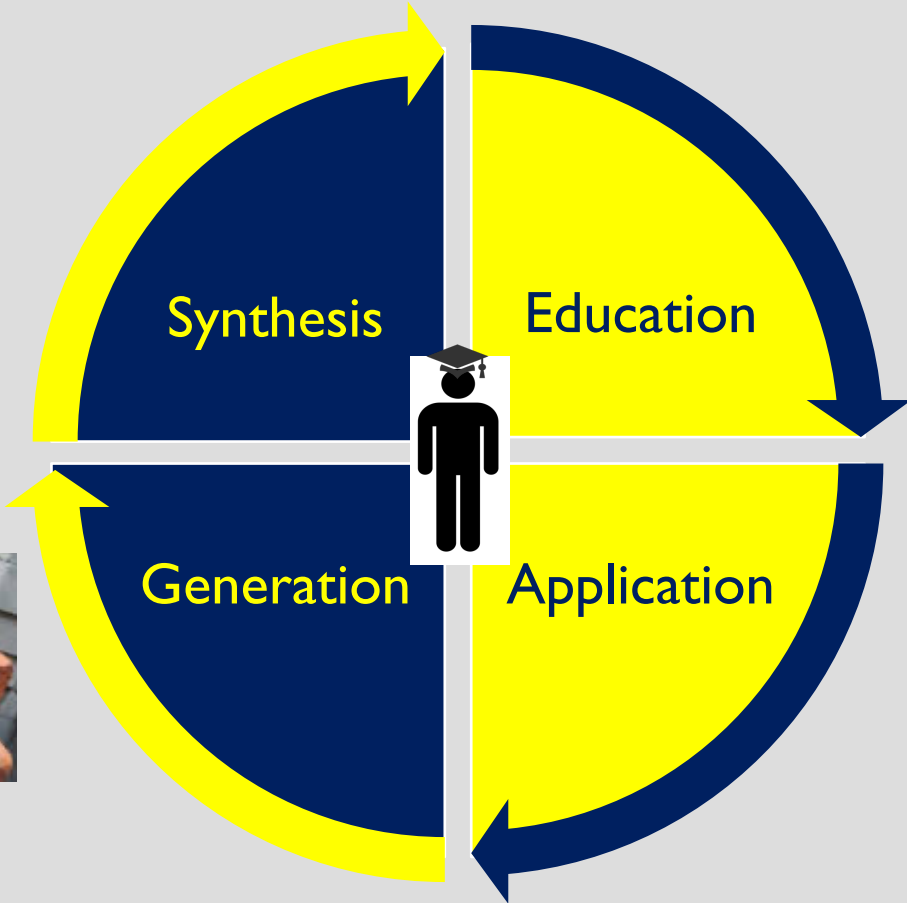
$$-2.78M (0.0365 - W_a)$$

THE MARKETPLACE IS, AND MARKETS ARE LIMITED



A promotional banner for Home Depot. The top part shows a woman in a yellow shirt working on a window. Text reads "THE HOME DEPOT" and "LEARN HOW TO DO IT YOURSELF". The bottom part features a "HOMEOWNER 101 WORKSHOPS" section with a "LIVE STREAM" icon and a "GET STARTED >" button.

SO IS THE SCHOLAR-ENTREPRENEUR



#4 Components Of Bricks [Ingredients of good Bricks]

- Silica - 50-60% - maintain shape and size prevent shrinkage
- Alumina - 20-30% - Impart plasticity
- Lime - <10% - help in fusion
- Iron oxide - 5-6% - Impart reddish colour
- Magnesia - < 1% - excess decay the Brick



WORSE, WE ARE IN A MARKET FOR LEMONS



IN THE MARKET FOR LEMONS, WE LOSE

https://www.youtube.com/watch?v=ibBTQG5Thxc

YouTube Search SIGN IN

We are here to guide and inform, not surprise and delight

9000 views

79,000 views

Scott Tannenbaum on the "Science of Teamwork": HHP Directorate Innovation Lecture Series
8,654 views • Oct 21, 2015

42 DISLIKE SHARE SAVE ...

Redefining Teamwork: Dr. Peter Coleman
Talks at Columbia
1.7K views • 4 years ago

Quantum Reality: Space, Time, and Entanglement
World Science Festival
6.6M views • 4 years ago

Mix - Scott Tannenbaum on the "Science of Teamwork": HHP...
Personalized playlist for you

Teamwork Reimagined | Kevin Cahill | TEDxSunValley
TEDx Talks
79K views • 4 years ago

Negotiation expert: Lessons from my horse | Margaret Neal...
TEDx Talks
188K views • 6 years ago

Dr. Eduardo Salas at the Patient Safety & Quality Management...
HealthQualityAB
2.5K views • 8 years ago

A lot of 'feely' jive—not approaching any expectable science of operations, after 9 minutes... How does a team organizer define the operation and goal, to minimize unnecessary overlap without gaps in effectiveness, (a product/performance-oriented view but it illustrates what I expect of this lecture but that's not forthcoming; he's jiving about feeling, effectiveness, and it's probably why he's a psychologist instead of lucid; if there is, a definition, it's not showing nor getting there, nor introducing the requirements that lead, to, 'teaming happens').... CRM?

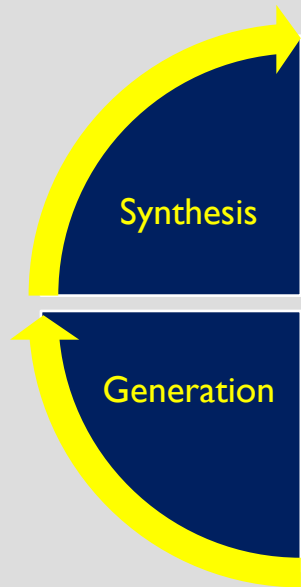
WE COMPETE ON THE WRONG DIMENSIONS

	Mgt Scholarship	Guru Advice	Bullsh... er influencers
Useful – guides and informs action in valid and reliable ways	++	?	--
Usable – is feasible to apply to the situation	--	++	-
Desirable – people are inclined to use the knowledge	-	+	++

PARTICIPATING UNDERMINES OUR CORE VALUE



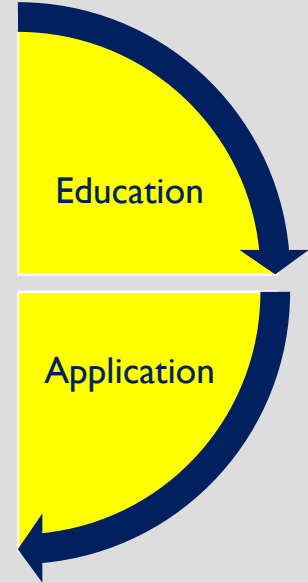
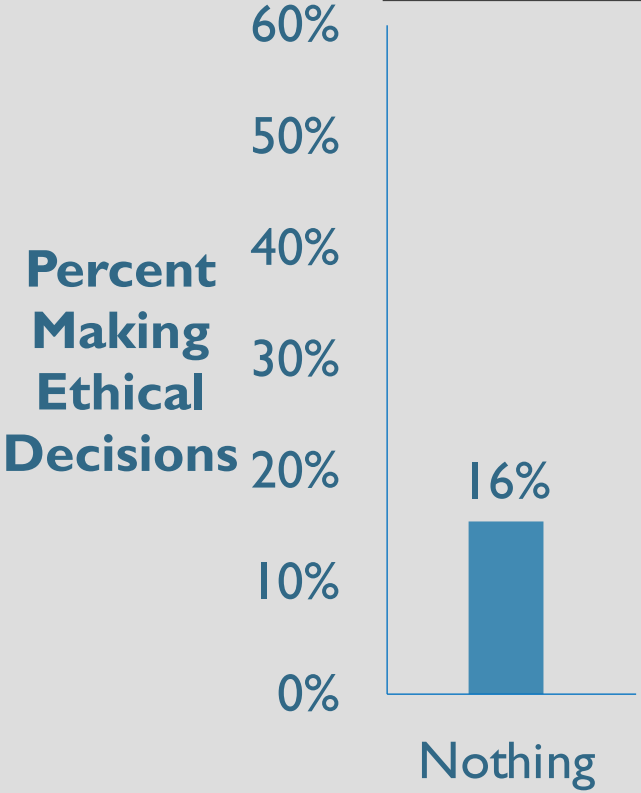
A debate over whom to hire encourages team members to focus on information that may be inconsistent with how they formed their original opinion.



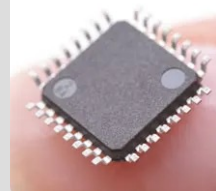
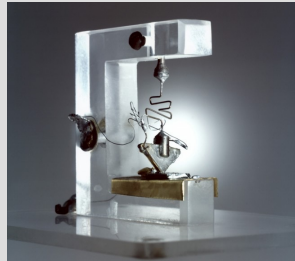
“What is happening here is that **practices are** altering the meaning of ‘being informed’ by creating a species of information that might properly be called disinformation. Disinformation does not mean false information. It means misleading information—misplaced, irrelevant, fragmented or superficial information—*information that creates the illusion of knowing something but which in fact leads one away from knowing.*”

- Neil Postman

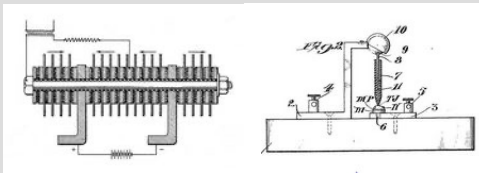
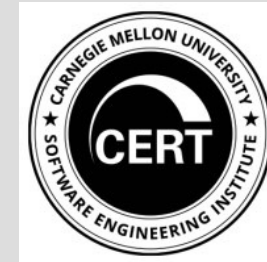
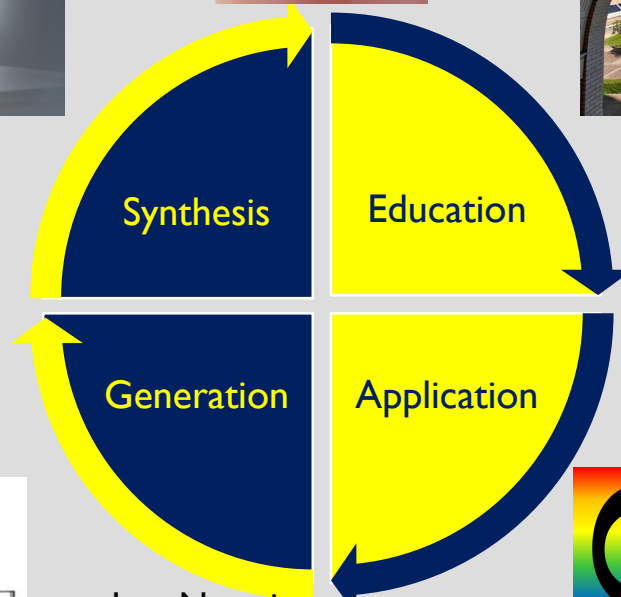
THIS IS TRUE EVEN WHEN THE CONCEPT IS SIMPLE



OUR PRODUCT SHOULD NOT BE MASS MARKET ATTENTION IS NOT OUR ULTIMATE CONCERN



1. Hall effect
2. Quantum mechanics
3. Intrinsic semiconductors
4. Dopants
5. Minority carriers



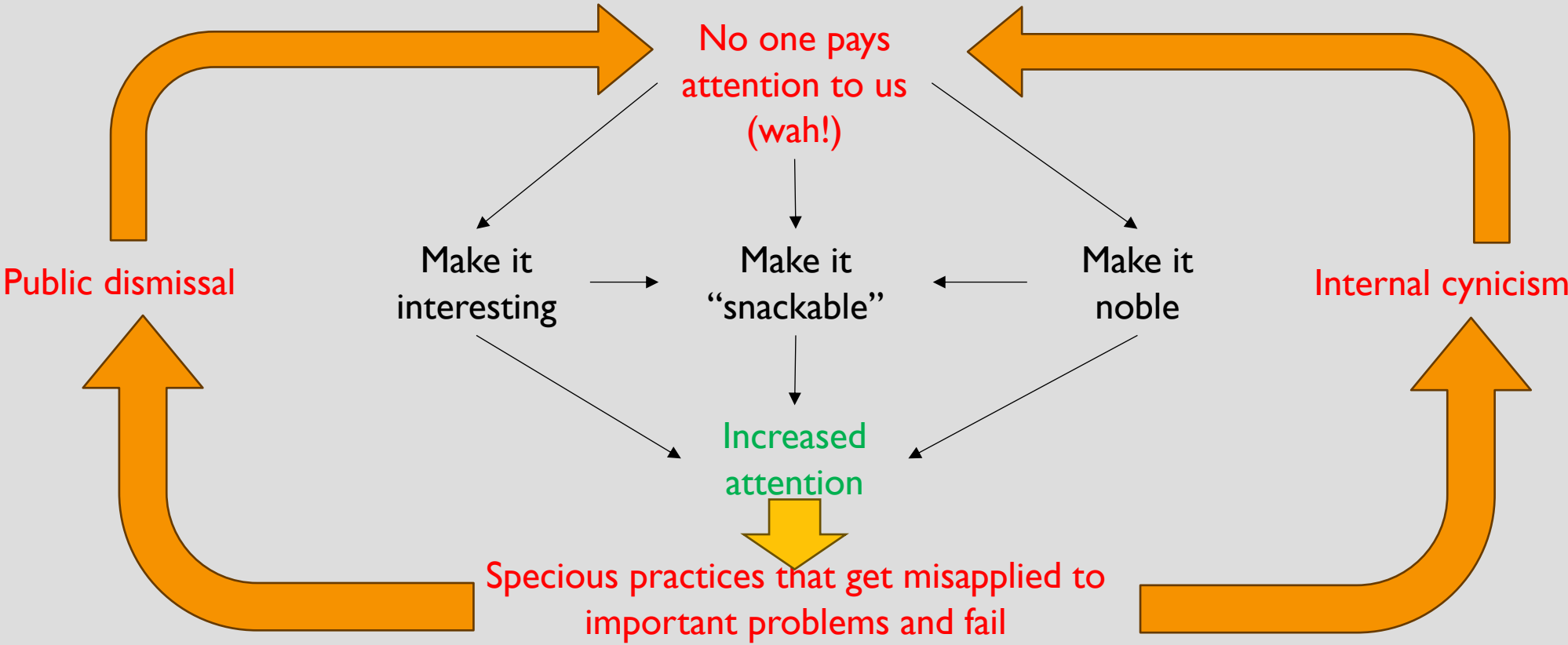
CuO₂
rectifier

Crystal
detector

1. Negative temperature coefficient of resistance
2. Photoconductivity
3. Rectification
4. Photovoltaic effect
5. Electroluminescence



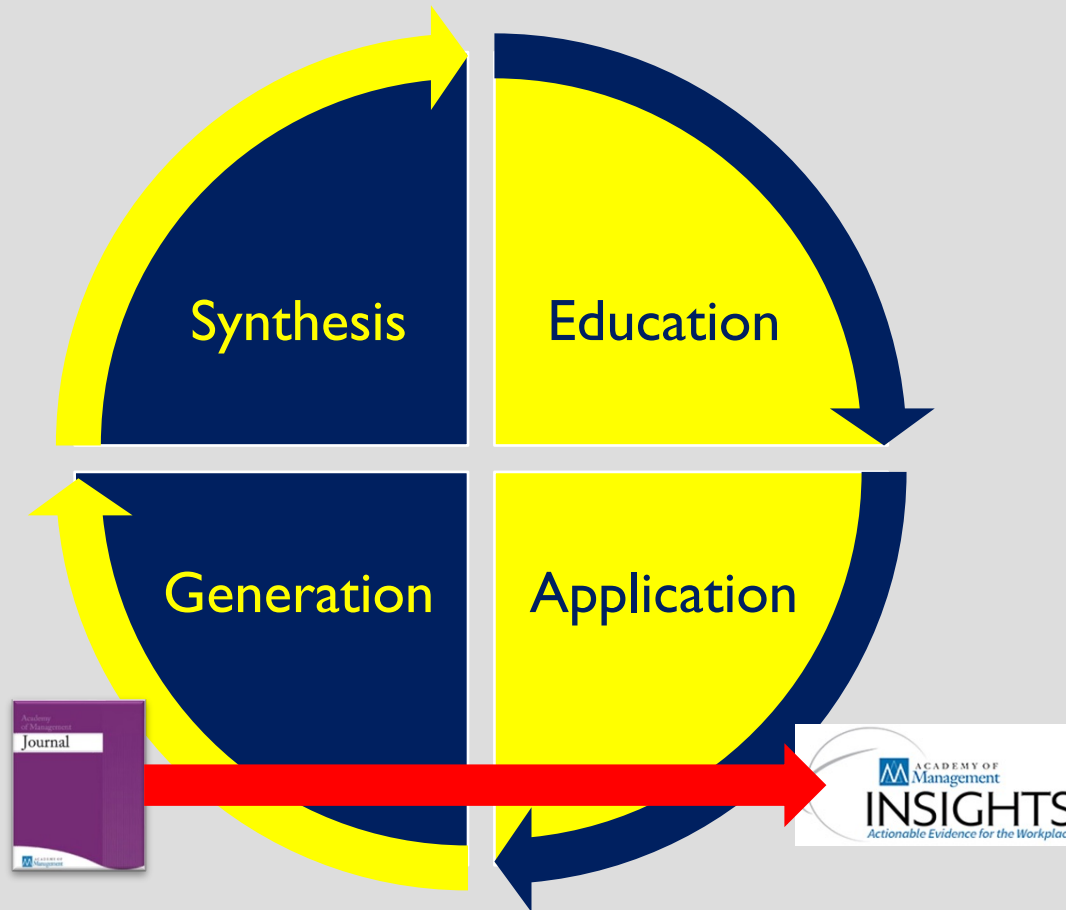
PRETENDING THAT OUR PRODUCT IS A MASS MARKET COMMODITY AND ATTENTION OUR ULTIMATE CONCERN IS WHY WE ARE HERE



CREATING AN ENTERPRISE

(Re)Building faith and trust in our science

FIRST DO NOT MISLEAD



SECOND, CLARIFY AND COMMUNICATE HOW PRODUCTS FIT TOGETHER

Knowledge:

Structures of findings that explain M&O phenomena; knowledge is the basis for curricula

Synthesis

Education

Curricula: Useful frameworks for guiding M&O operations; they frame end user training

Findings:

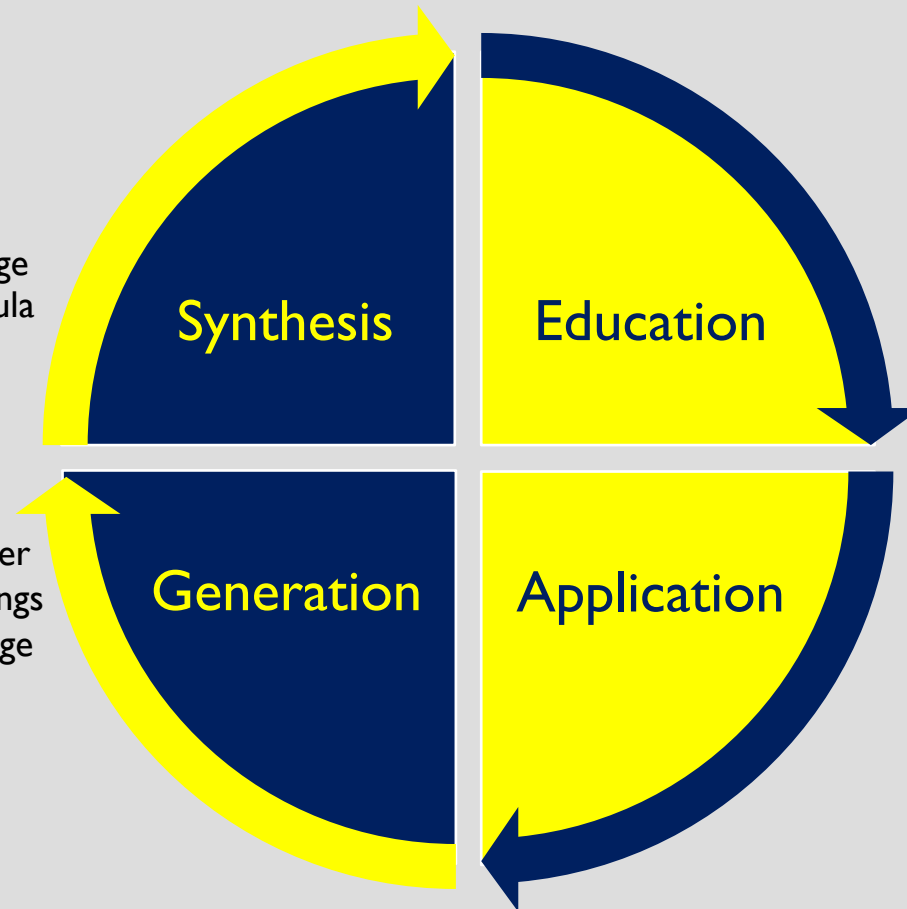
What is true and under what conditions; findings the basis for knowledge

Generation

Application

Training:

Evidence based lessons for how to control specific situations; they validate/challenge findings



THIRD, DIFFERENTIATE THE STAKEHOLDERS



Enterprise Members

We just need a place to move into

I want to go see a show



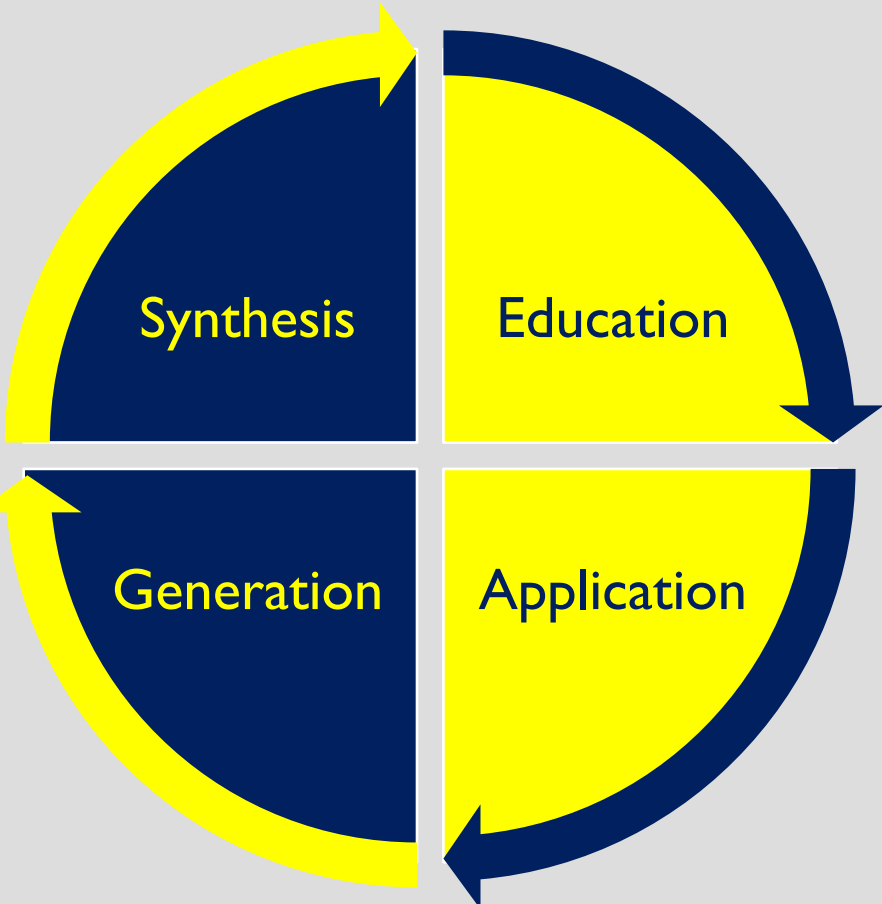
End Users

WE MUST MAP AND ALIGN PRODUCTS, FUNCTIONS, AND CONSUMERS

I figure out settled science



We figure out fundamental concepts and causes



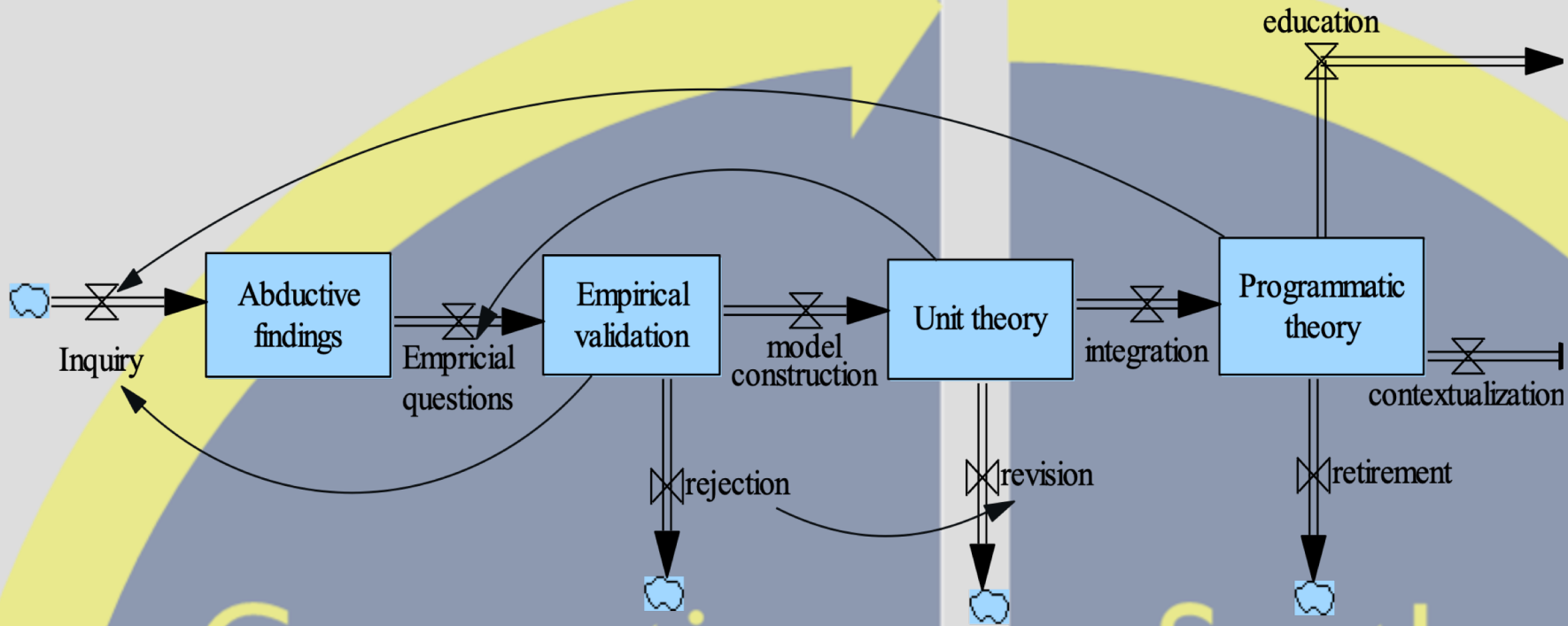
I teach the latest best practice



I (end user) need a solution



I help end users directly

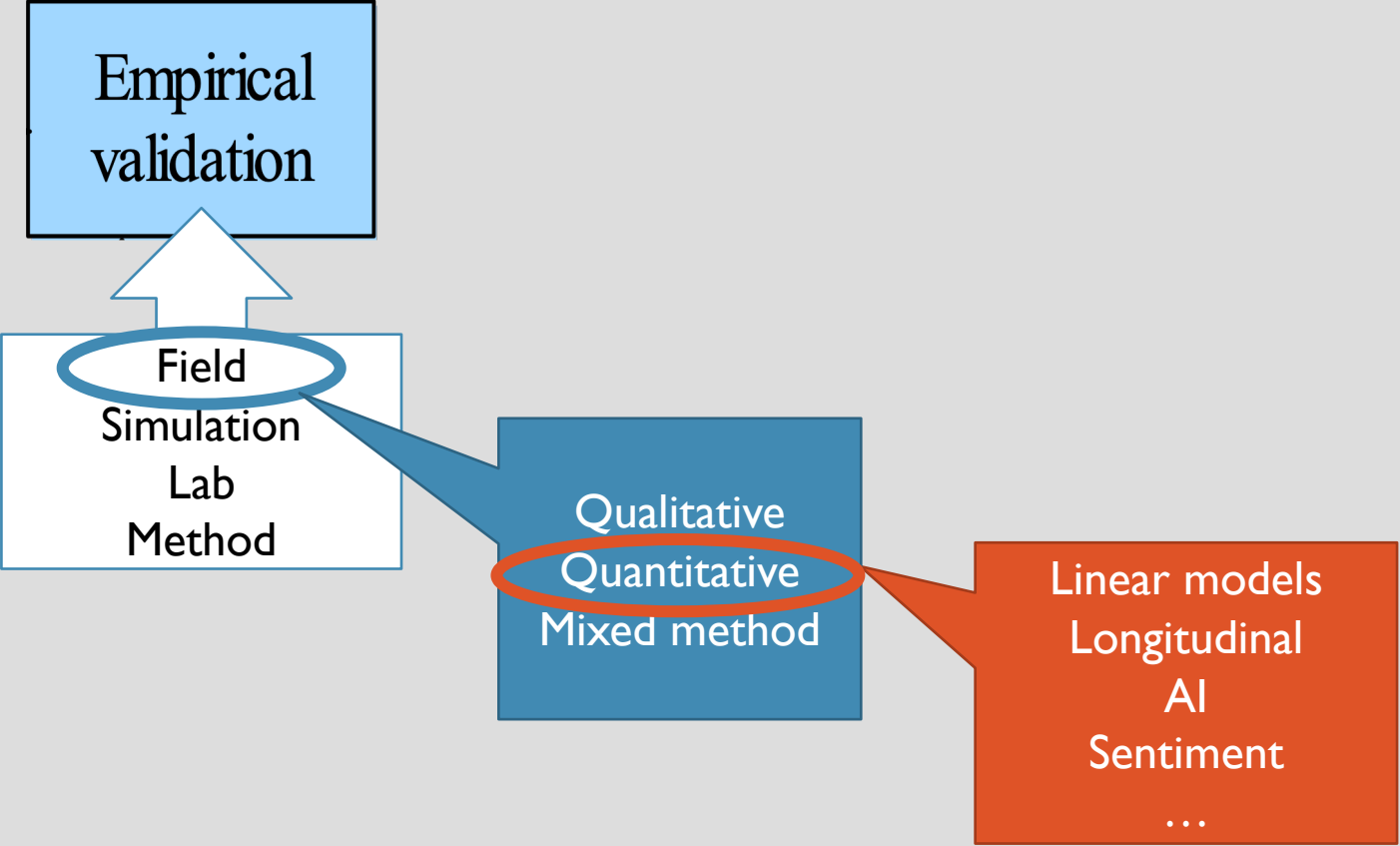


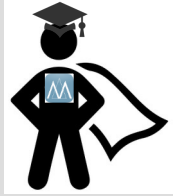
Generation

Synthesis

PRODUCTS EMERGE FROM A
MANAGEABLE PROCESS

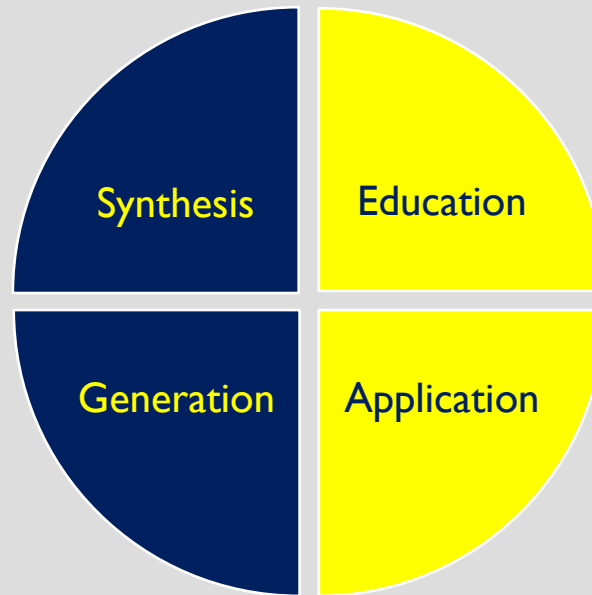
PROCESSES AND PRODUCTS HAVE MULTIPLE SUB-PROCESSES (AND PRODUCTS)





WE MUST CHANGE OUR VIEW OF THE SCHOLAR ENTREPRENEUR

WITHIN EACH QUADRANT , THE CAPACITY TO SPECIALIZE IS DEEP, AND COORDINATION IS NON-TRIVIAL



John Mathieu sez:

“Me, Ed Salas, Scott Tannenbaum, Steve Kozlowski, and Amy Edmondson have managed to have real impact across the quadrants”

RATHER WE CAN SPECIALIZE, AND NOT JUST IN TOPICAL AREA



- Production skills

- Generation
 - Design
 - Mixed method
 - Lab/ Field
 - Survey/experiment
 - Data
 - Qualitative/Quantitative
 - Multilevel
 - Network
 - System Dynamic
- Synthesis
 - Modeling
 - Formal
 - Computational
 - Measurement
 - IRT
 - Scale development
 - AI
 - Review
 - Systematic
 - Integrative

- Dissemination skills

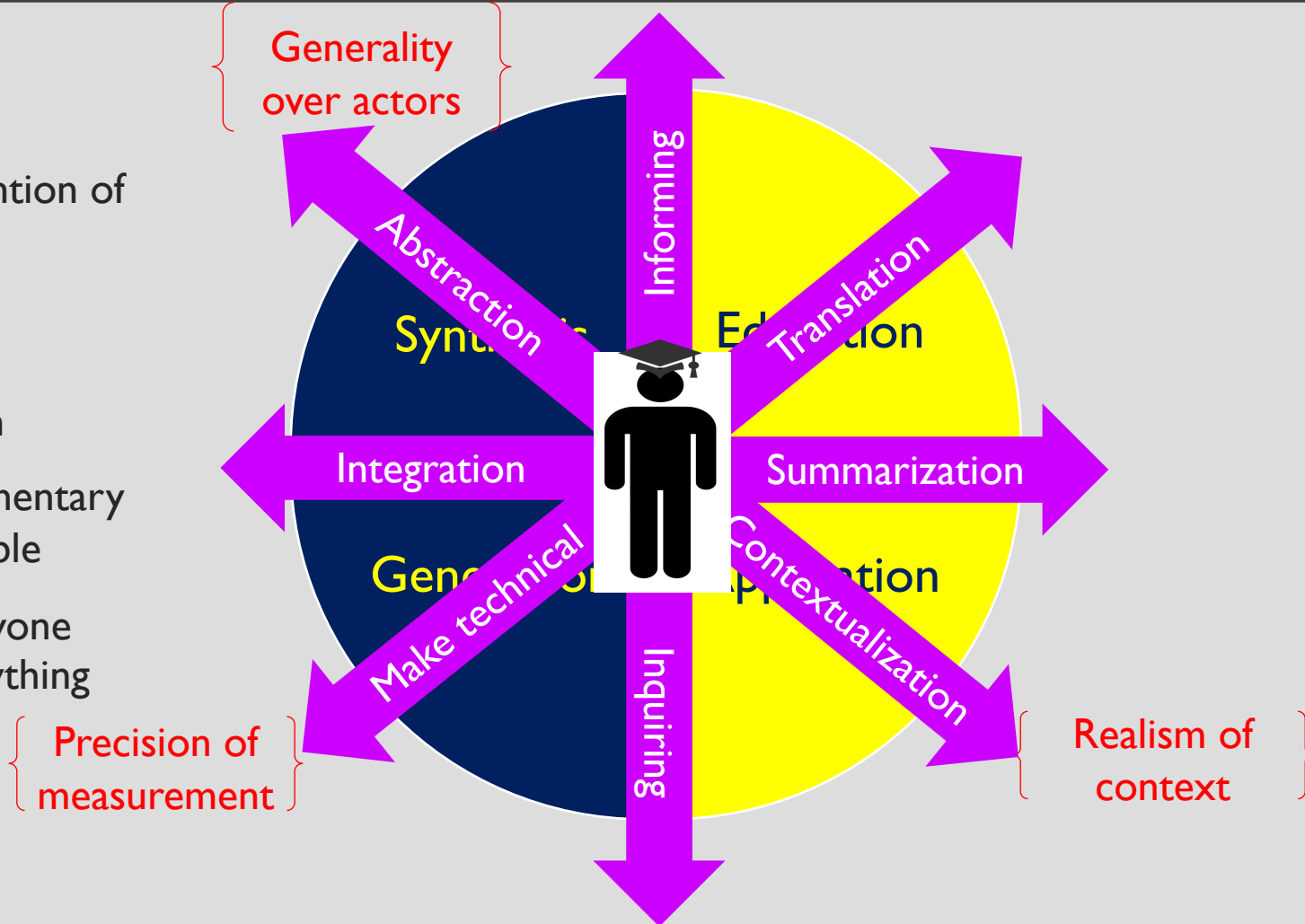
- Teaching
 - Curriculum design
 - Course design
 - Undergrad/grad
 - Short/medium/ long courses
 - MOOCs
 - On-line/hybrid
 - Learning theory
 - Research mentorship
- Training
 - Content area
 - Negotiation
 - Creativity
 - ...
 - Exercise design
 - Contextualization
 - Needs analysis
 - Training KSAs
 - White papers
 - ...

- General skills

- Writing
 - Books
 - Articles
 - Blogs
- Presentation
 - Power point
 - Media
 - Lecture
 - Speaking
- Project management
 - Lab group
 - Grants
 - Research projects
- Technology
 - Web
 - App
 - Media
 - Statistical
- Peer Review
 - AE
 - EIC

THIS IS BENEFICIAL FOR ENTERPRISE MEMBERS

- ❖ The greatest invention of management is specialization and coordination
- ❖ Time is zeros sum
- ❖ Skills are complementary but not maximizable
- ❖ I don't think everyone wants to do everything



COORDINATION IS POSSIBLE WITHIN AND BETWEEN SCHOOLS



BUT THIS CRAP INHIBITS SUCH COORDINATION

Name	Peer School	Ph.D. Year	Ph.D. Institution	Faculty Title	Tenured? Yes/No	Research Awards	Number of "A-Hits"	Total Citations	#1 Paper's Citations	Course Evaluations: Mean/SD
Peer 1										
Peer 2										
Peer 3										
Peer 4										
Peer 5										
Peer 6										
Peer 7										
Candidate										
Peer 8										



WE MUST ALSO ESCHEW FT50, UTD, US NEWS, AND OTHER BS

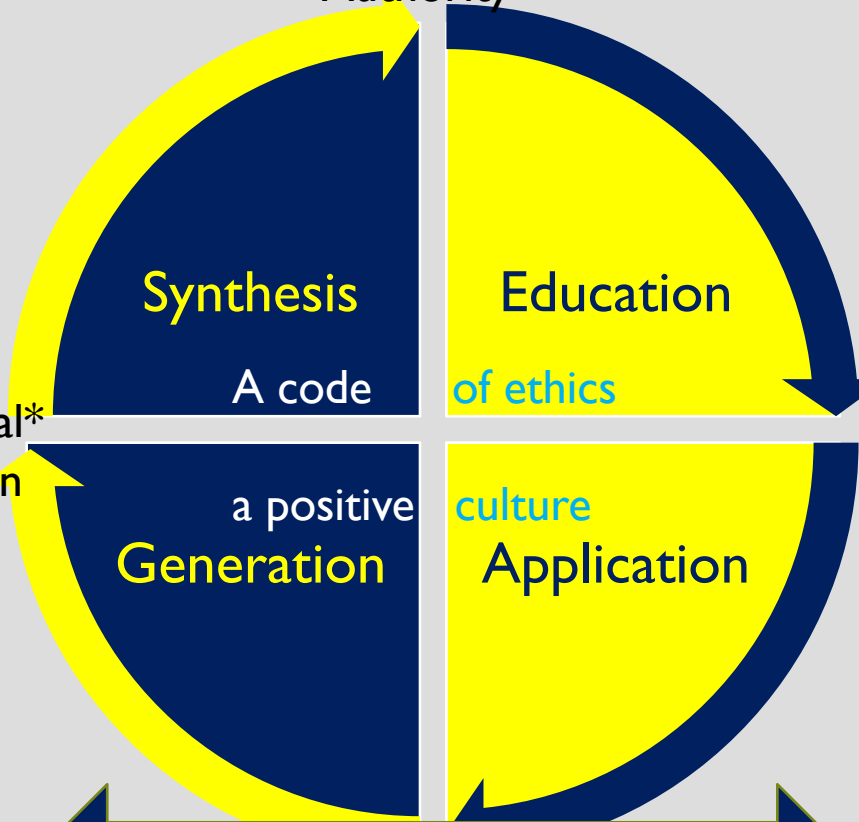
- **Our ultimate concern** - The application of reason (science) to improve human made systems (management and organizations) for the purpose of human betterment (broadly defined)
- “Science is an unstoppable force because we are all working to maintain the ecosystem... it’s not King of the Hill.”
 - Jim Morris, computer science pioneer
- “Maybe that is why *computer science* has made such gains...”
 - (My response)

**Production
(Research)**

THIS IS A VALUE CHAIN, THE
BOTTOM LINE MENTALITY DEMEANS IT

What should we teach?
Authority

What explanations are best?



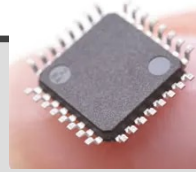
How does context limit usability?

**Dissemination
(Teaching)**

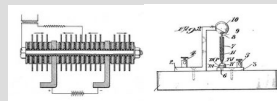
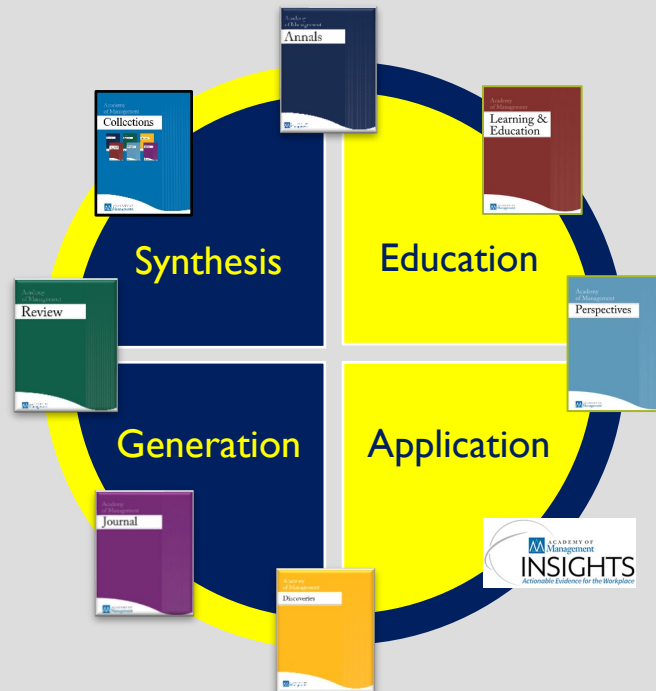
RE-ALIGNING OUR EFFORTS

We have made some progress!!!

WE ARE STARTING TO COORDINATE THE DIFFERENT SCHOLARLY VEHICLES

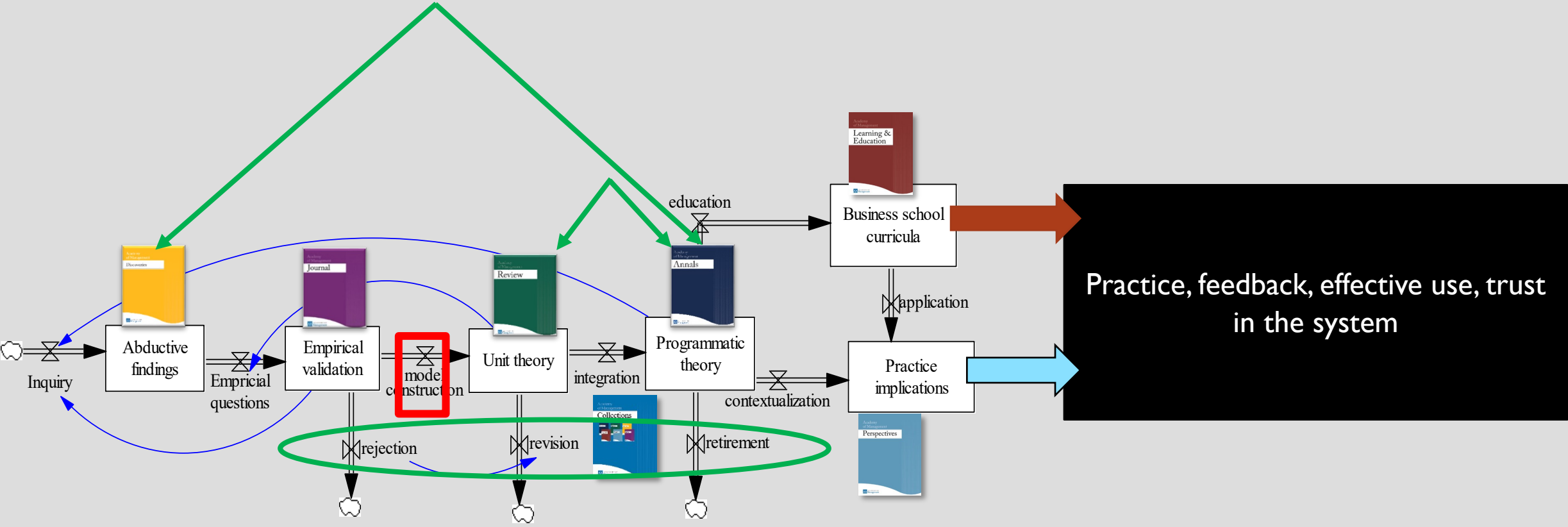


1. Hall effect
2. Quantum mechanics
3. Intrinsic semiconductors
4. Dopants
5. Minority carriers

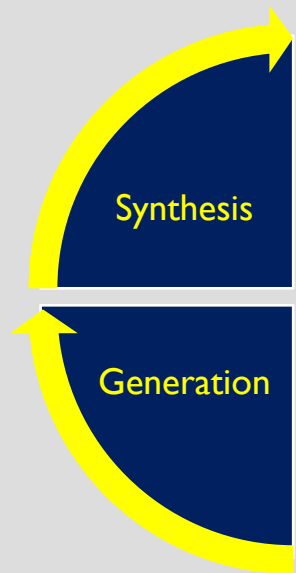


1. Negative temperature coefficient of resistance
2. Photoconductivity
3. Rectification
4. Photovoltaic effect
5. Electroluminescence

WE ARE STARTING TO THINK ABOUT HOW TO BETTER CONTROL THE SYSTEM



BUT WE STILL NEED TO CHANGE HOW WE THINK ABOUT PRODUCT



- **Advanced Materials**
 - Non-Equilibrium Lattice Dynamics in Photo-Excited Two-Dimensional Perovskites
 - Thermoformable Boron Nitride Based All-Ceramics
 - Multi-functionality of $\text{Li}_2\text{SrNb}_2\text{O}_7$: Memristivity, Tunable Rectification, Ferroelasticity, and Ferroelectricity
 - Digital Keying Enabled by Reconfigurable Two-dimensional Modulators
- **New England Journal of Medicine**
 - Fractional Flow Reserve or Intravascular Ultrasonography to Guide PCI
 - Nirmatrelvir Use and Severe Covid-19 Outcomes during the Omicron Surge
 - Dolutegravir in Pregnancy as Compared with Current HIV Regimens in the United States
 - Bedaquiline–Pretomanid–Linezolid Regimens for Drug-Resistant Tuberculosis

THE ARTICLE IS THE BRICK, AND NEVER A SUFFICIENT TEACHER

- Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition
- A relatively small sample of computer vision and pattern recognition information in applications such as face recognition is often sufficient to reveal the meaning the user desires.

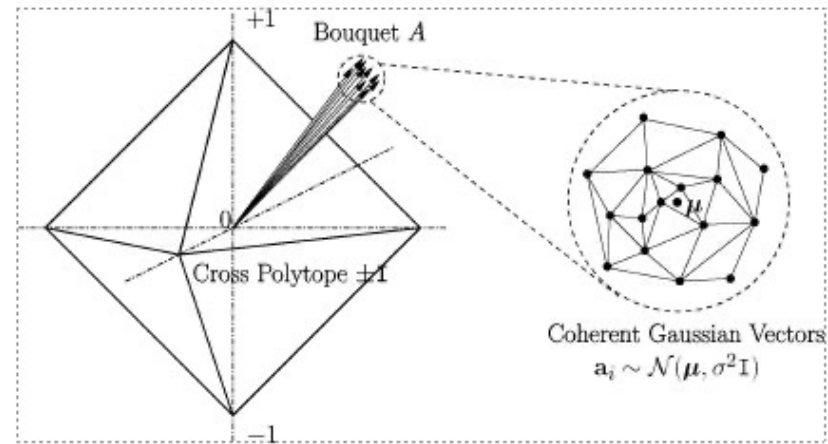


Fig. 3. The “cross-and-bouquet” model. (Left) The bouquet D and the cross-polytope spanned by the matrix $\pm \mathbf{I}$. (Right) Tip of the bouquet magnified; it is modeled as a collection of i.i.d. Gaussian vectors with small variance σ^2 and common mean vector μ . The cross-and-bouquet polytope is spanned by vertices from both the bouquet D and the cross $\pm \mathbf{I}$ [86].

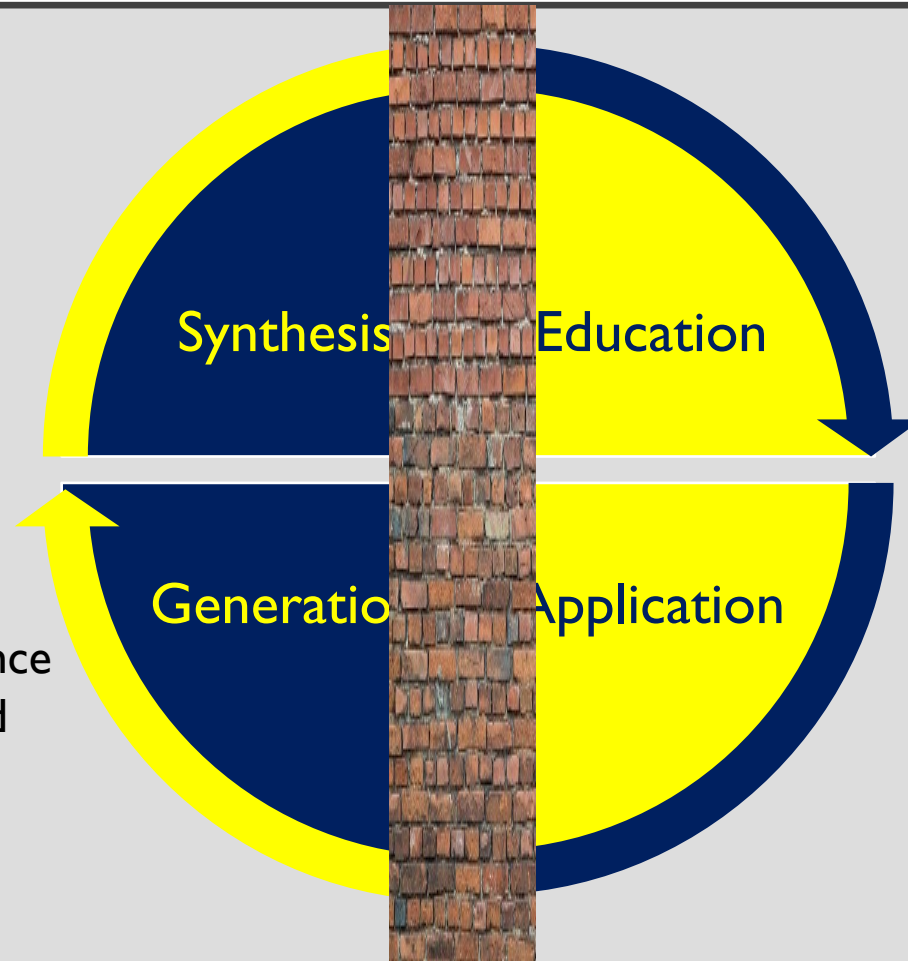
SYNTHESIS CREATES THE POSSIBILITY FOR EDIFICES, BUT EDUCATION IS KEY TO INHABITING THEM

- We should focus on asses in the seats
 - If classes are packed, even if no one read anything we wrote, we would all have jobs.
 - “We” includes **all** members in the enterprise, not just researchers
- Teaching is the most impactful means of dissemination and connection to end users
 - Provides the emotional connection
 - Is the least replicable/ replaceable by *external* competitors
 - It reduces misuse and misapplication

THERE IS NOTHING TO TEACH WITHOUT RESEARCH

What can we say with confidence (because we tested it many ways, and we know how things fit together)?

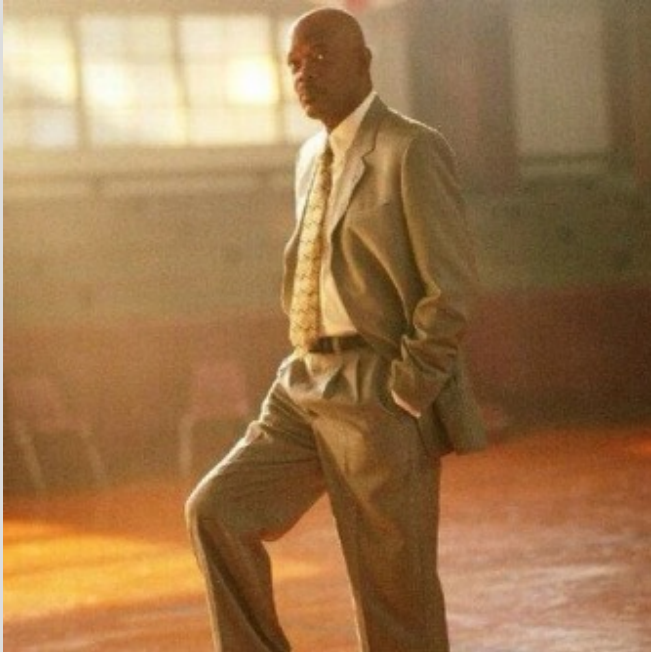
How and why do your practices work? (can science tell you how to improve and scale?)



What topics do different kinds of students really need to understand (depending on their level and program)?

What contextual boundaries matter (what makes contexts meaningfully different for any topic)?

FOR ALL IN THE ENTERPRISE
WE NEED FAITH AND COURAGE
ALSO INSTITUTIONAL SUPPORT



“I run a government program that helps the poor people who own their own land secure funding for building houses. I have to convince my government that my program is having impact. I need real science about how to measure impact, not gimmicks or cute stories”

-Maria

IT ALSO REQUIRES DOUBLE-LOOP LEARNING

- We beg for legitimacy. You know who doesn't?
 - Physicians (despite alternative medicine)
 - Computer scientists (despite illusory productivity gains)
 - Economics (despite untenable assumptions)
 - Mathematics (despite inscrutable knowledge)
- All fields have their nay-sayers, but
 - they have found ways to cement their position in the eyes of the world,
 - And more importantly, to their constituents
- *This is about culture and socialization! (which also happens in school)*
 - *It is a long term goal that requires an enterprise solution*

AND SO...

THE GOOD: WE TOTALLY HAVE THE SKILLS

Immediate
needs

- **Stakeholder analysis** – What has impact to whom (researchers, teachers, students, administrators, partners)?
- **Task analysis** – What are the production roles and functions within generation, synthesis, education, and application?

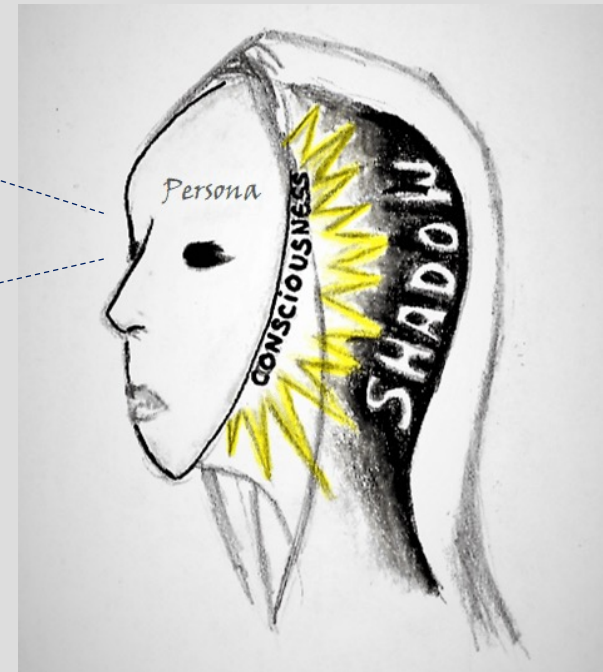
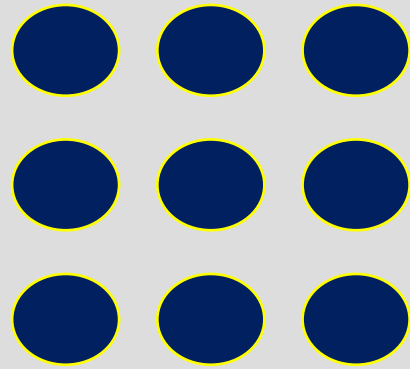
Next step

- **Model building** – How do we represent the value chain and its components?
- **Institutional change** - How do we motivate a renaissance in our field?
- **Performance analysis** – Are the people and the system effective and efficient? How do we improve
- **Culture and governance** – How do we maintain a healthy environment?

**THE BAD:
THIS IS NEITHER A SHORT NOR AN EASY FIX**

- We have to actually understand the *whole* system
- We have to build a lot of infrastructure to support the integration
- We have to negotiate with a lot of different stakeholders
- It is a long term project that must be able to evolve

THE UGLY:
HABIT AND UNRECOGNIZED DEFENSES
CREATE A LOT OF INERTIA



A BETTER STORY

The class was packed, and the waitlist meant it would be no matter how things shifted after add/drop. The school needed to hire, because all the classes were packed, and this was true across all universities. There was good reason – those who learned about management and organizations would reliably and consequentially improve their organizations. Societies worked through organizations, so improved organizations meant improved societies and improved lives.

Organizational scholars had stopped seeing themselves as a loose confederation of intellectual entrepreneurs forced to use ever more bombast to fight for attentional market share. They had become a specialized and coordinated federation of scholars whose legitimacy was a matter of faith based in the demonstrably consequential truths that science delivered. Scholars called it The Enterprise to remind everyone that it was a purposeful collaborative far larger in scope and purpose than any one person.

IT'S A BIG JOB

But somebody has to do it