The Science of How Students Learn:

A Foundation for Authentic Assessment

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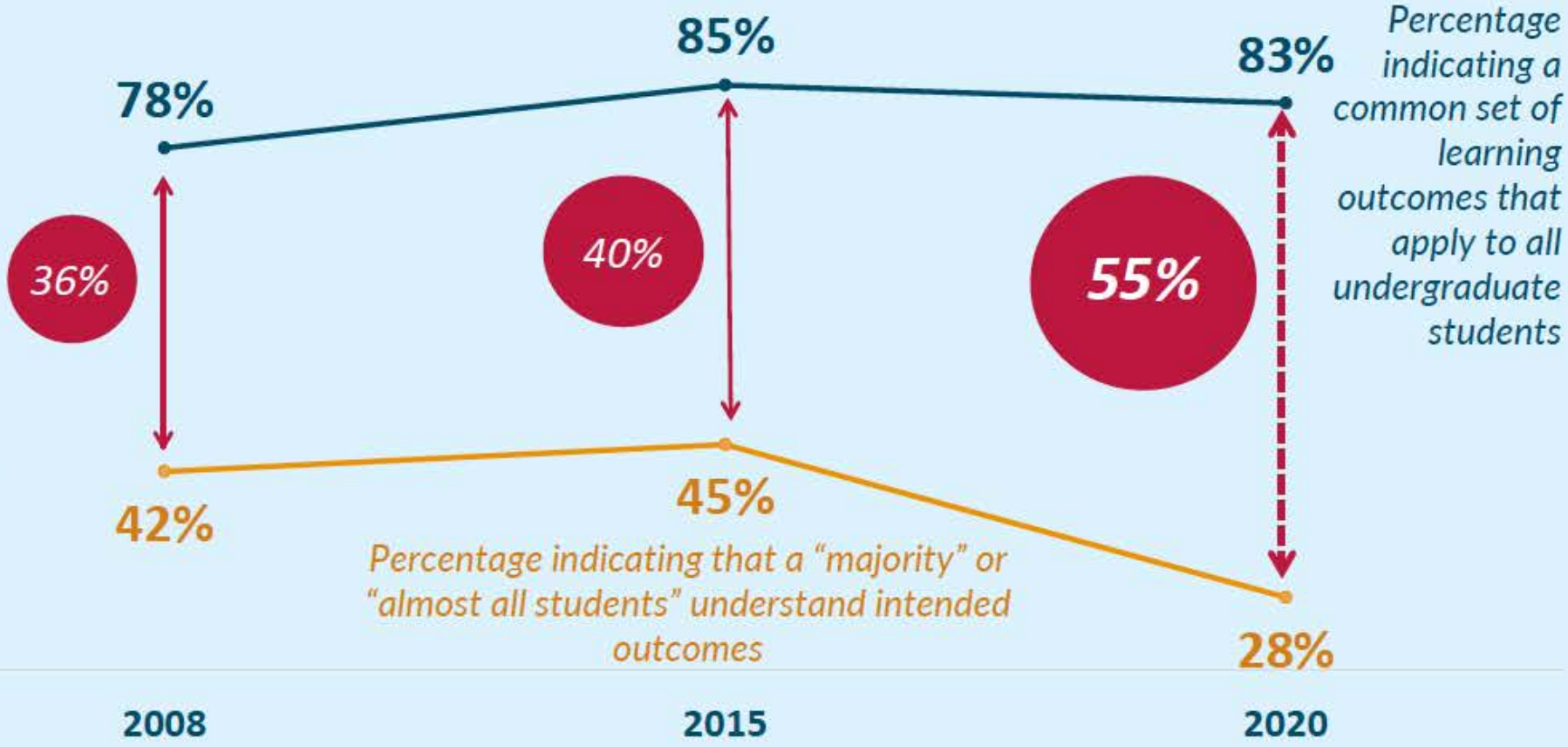
The majority of U.S. institutions have articulated a common set of learning outcomes for all their students.

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However, there is declining confidence that students understand intended learning outcomes.

In 2020, the largest gap was found between the percentage of campus stakeholders who reported having a common set of intended learning outcomes and stakeholders' belief that "almost all" or a "majority" of students understand those outcomes.

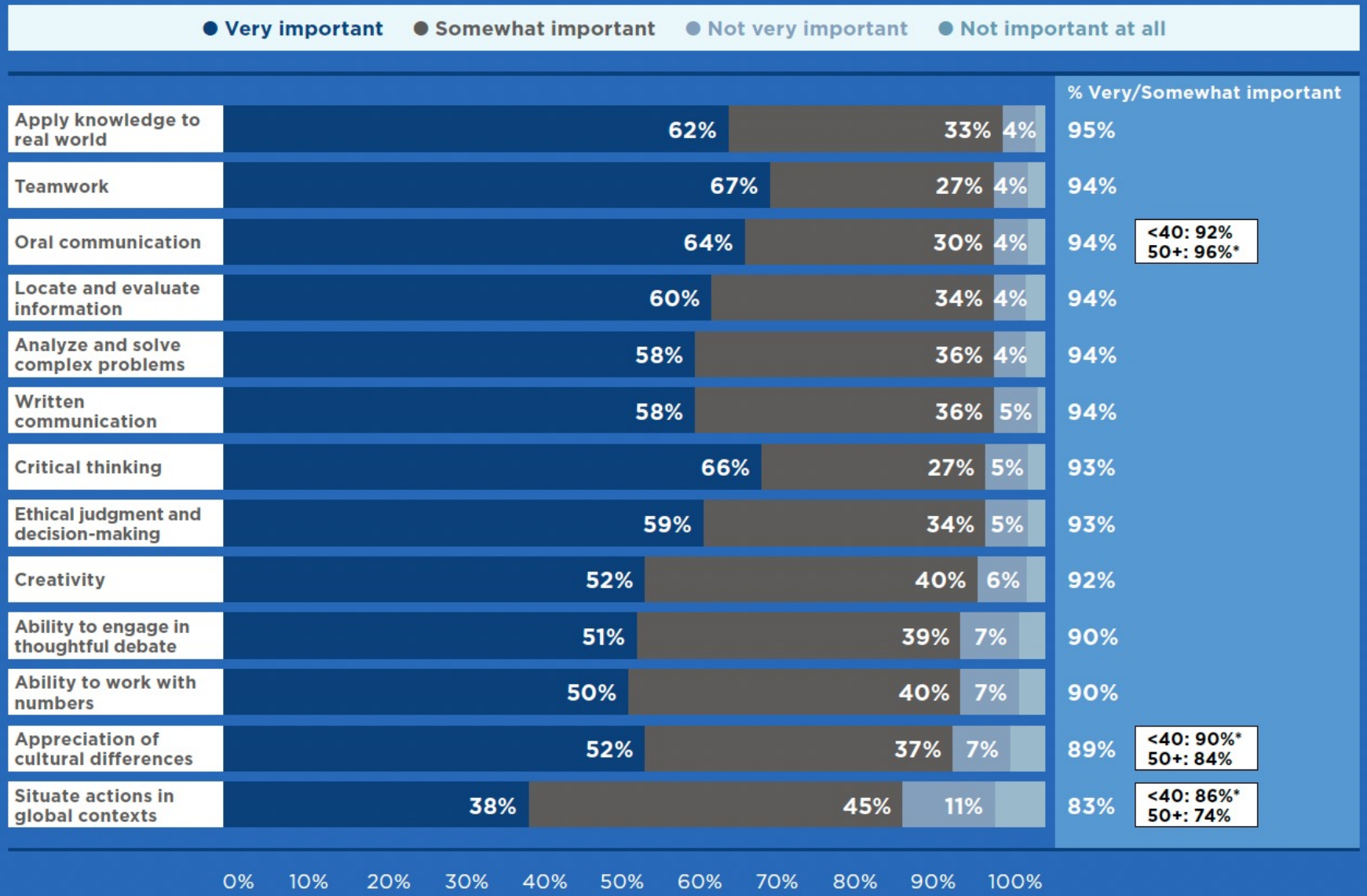
Percentage of Stakeholders Who Report Having a Common Set of Learning Outcomes vs. Percentage of Students Believed to Understand Outcomes



Finley & McConnell, 2022
https://www.aacu.org/research/on-the-same-page

Employers give high marks to real-world application, teamwork, and verbal skills. Responses also reflect the emerging importance of AI literacy.

Prompt: Please indicate how important it is that recent college graduates demonstrate proficiency in each of the following skills when being hired for entry-level positions at your company or organization.



Finley, 2025
https://www.aacu.org/research/the-agility-imperative

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EDUCATION

Will a Bachelor's Degree Matter as Much for Gen Z?

by Ryan Craig

OCTOBER 07, 2019



BY NC SA

yahoo! finance

Data highlights the difference in perceived and actual value of a college degree in America



Aarthi Swaminathan · **Reporter**

May 22, 2021 · 6 min read

The expected income and wealth boost from earning a college degree has slowly been shrinking while the cost of college and student debt burden has been rising, according to a report from the Economic Policy Institute (EPI).

The so-called "college premium" steadily rose throughout the 1980s and early 1990s, but the growth began to slow by the mid-1990s, EPI found. (A 2018 report from the St. Louis Fed noted that this was an ongoing trend, particularly for people of color.)

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Pew Research Center

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REPORT | MAY 23, 2024 SHARE

Is College Worth It?

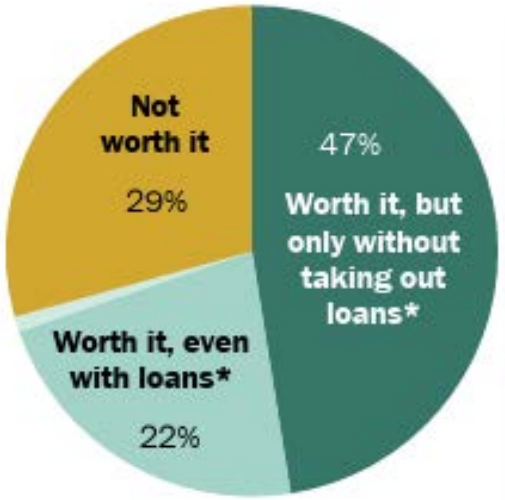
As economic outcomes for young adults with and without degrees have improved, Americans hold mixed views on the value of college

BY RICHARD FRY, DANA BRAGA AND KIM PARKER



Only 22% of U.S. adults say the cost of college is worth it even if someone has to take out loans

% saying the cost of getting a four-year college degree today is ...



* Refer to topline for full question wording.
Note: Share of respondents who didn't offer an answer is shown but not labeled.
Source: Survey of U.S. adults conducted Nov. 27-Dec. 3, 2023
"Is College Worth It?"

PEW RESEARCH CENTER

4 in 10 Americans say a college degree is not too or not at all important in order to get a well-paying job

% saying it's ____ important for someone to have a four-year college degree in order to get a well-paying job in today's economy

	Extremely/ Very	Somewhat	Not too/ Not at all
All adults	25	35	40
Rep/ Lean Rep	17	33	50
Dem/ Lean Dem	33	38	30

Note: Share of respondents who didn't offer an answer is not shown.
Source: Survey of U.S. adults conducted Nov. 27-Dec. 3, 2023
"Is College Worth It?"

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Is College Worth The Cost? Pros Vs. Cons



Kat Tretina
Contributor

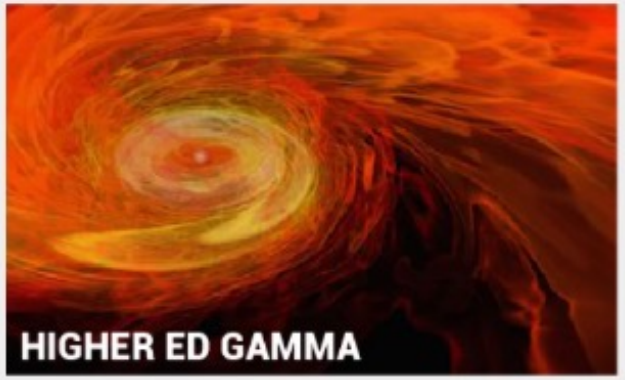
Updated: Mar 31, 2021, 3:53pm

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HIGHER ED GAMMA

MOOCS and beyond.

Higher Education's False Promise

> What should we do about the educated underemployed?

By Steven Mintz

// August 19, 2021

Is the United States producing an overeducated class with few prospects of holding a job commensurate with their education?

That appears to be the case.

Brandeis economist Nader Habibi wrote that too many politicians and parents ignore "an inconvenient truth: a large number of graduates in recent years have not been able to find well-paying jobs that actually require a degree." Just prior to the pandemic, 40 percent of recent graduates worked in jobs for which they were overeducated.

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Higher education *is* inherently valuable…



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But it isn't priceless.
-STEVEN MINTZ, *INSIDEHIGHERED*

With all of this in mind...

What are we doing today?

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Reframing the assessment narrative.

What if we purposefully designed assessment to be a **high-impact educational practice** (HIP)?

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High-Impact Practices

- Capstone Courses or Projects
- Collaborative Assignments + Projects
- Common Intellectual Experiences
- Diversity/Global Learning
- ePortfolios
- First-Year Seminars + Experiences
- Internships
- Learning Communities
- Open Educational Resources
- Service Learning, Community-Based Learning
- Undergraduate Research
- Writing Intensive Courses

Assessment?

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What makes a practice “high-impact”?



What makes a practice "high impact"?

(Kuh & O'Donnell, 2013)



Performance expectations set at appropriately high levels



Significant investment of time and effort by students over an extended period



Interactions with faculty and peers about substantive matters



Students are exposed to and must contend with people and circumstances that are unfamiliar



Frequent, timely, and constructive feedback



Periodic, structured opportunities to reflect and integrate learning



Opportunities to discover relevance of learning through real-world applications



Public demonstration of competence

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How do we get to high impact?

1. **Reflect** on your path as a learner
2. **Own** who you are as a professional
3. **Stretch** to be what your students/ colleagues/institution needs
4. **Support and challenge** one another

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#1
Reflect.

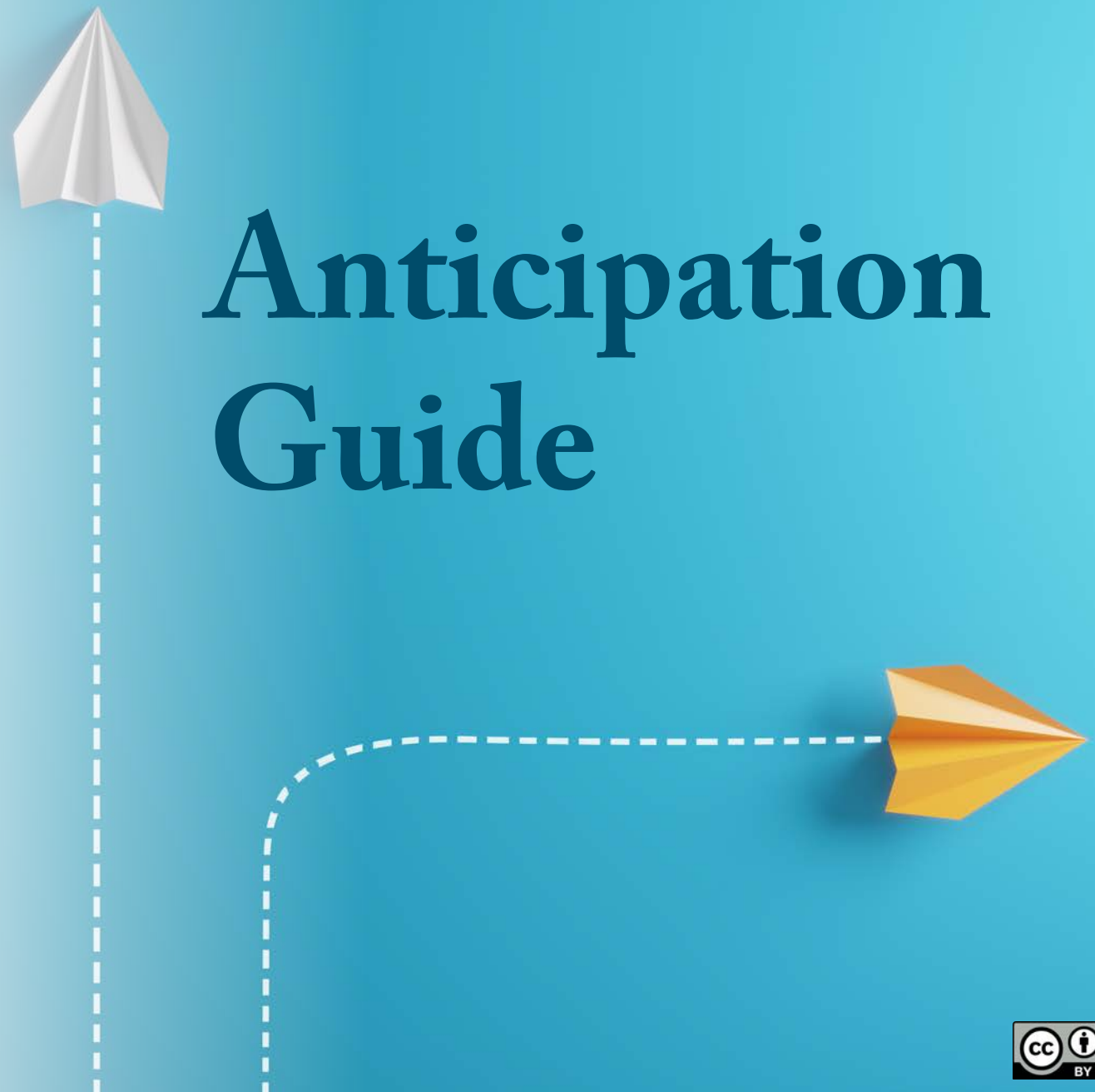
ACTIVITY

I’m going to present you with a series of statements.

For each statement, **please indicate how much you agree or disagree.**

- If you **agree** with the statement, toggle to the agree end (10).
- If you **disagree** with the statement, toggle to the disagree end (1).
- Feel free to also land somewhere in the middle!

Anticipation Guide



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Most of what students learn in college, they will still remember years after they graduate.

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Learning is more process than product.

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If a student can pass the test, they have learned the material.

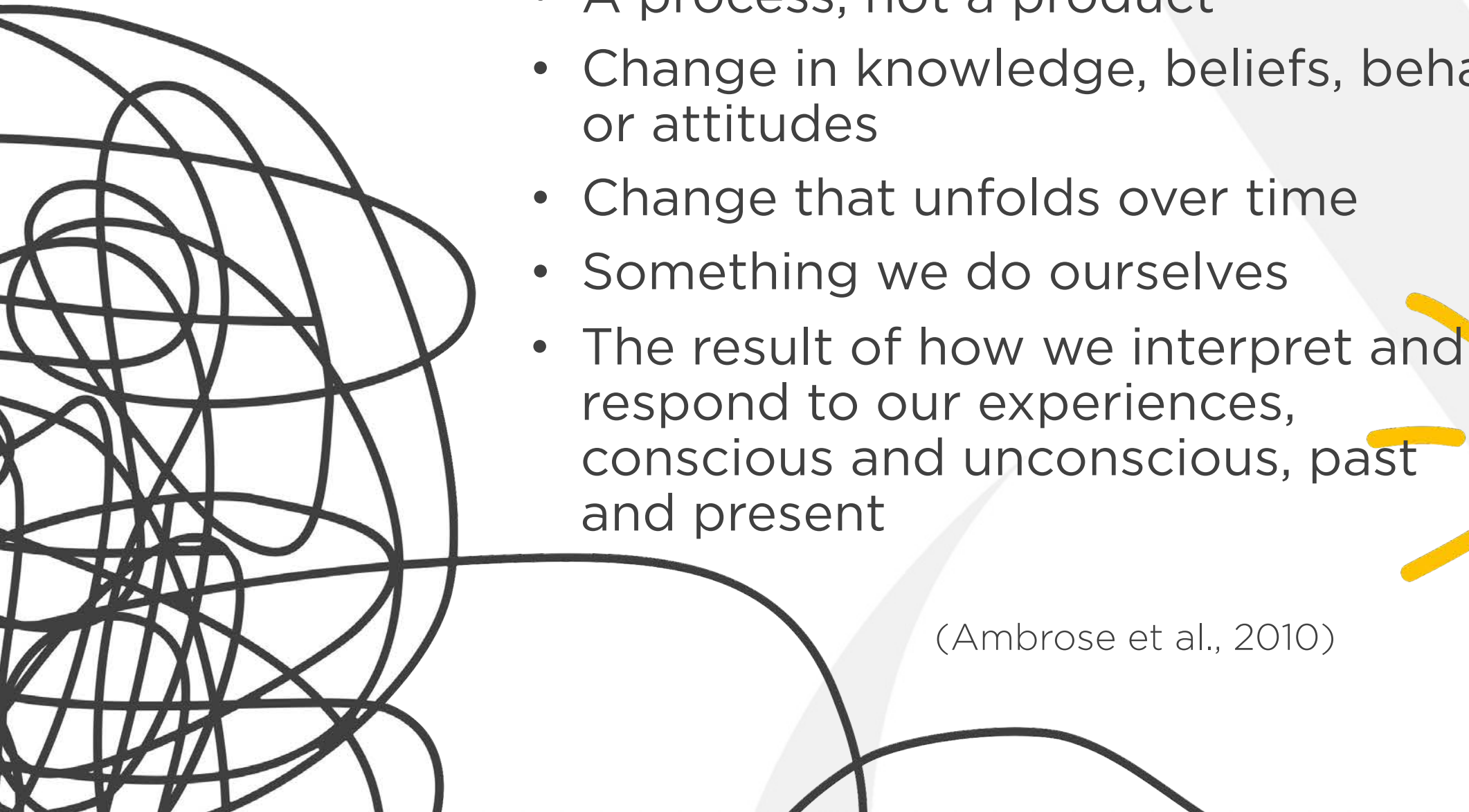
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What is learning?

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Learning is…

- A process, not a product
- Change in knowledge, beliefs, behaviors, or attitudes
- Change that unfolds over time
- Something we do ourselves
- The result of how we interpret and respond to our experiences, conscious and unconscious, past and present





(Ambrose et al., 2010)

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Reflect on your path as a learner.

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https://www.youtube.com/watch?v=kO8x8eoU3L4

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How Quickly We Forget...
UVA
WAHOOS
UVA

1993



1997



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1st Year:

1993 Fall

School: College & Graduate Arts & Sci
Major: Interdisciplinary - Echols Scholar

ENLT	255M	Special Topics	A		3.0
FREN	232	Intensive Intermediate French	B+		3.0
HIUS	367	Hist Civil Rights Movement	A-		3.0
PSYC	220	Introduction to Psychobiology	C+		3.0
SOC	255	Law and Society	B-		3.0
Curr Credits		15.0 Grd Pts	48.000	GPA	3.200
Cuml Credits		15.0 Grd Pts	48.000	GPA	3.200

Honor: Echols Scholar

1994 Spring

School: College & Graduate Arts & Sci
Major: Interdisciplinary - Echols Scholar

ARTH	102	History of Art II	B+		4.0
ASTR	102N	Introductory Astronomy	B-		3.0
ENNC	382	Austen, Eliot, Woolf	A-		3.0
PSYC	250	Intro to Child Psychology	B		3.0
PSYC	250	Intro Child Psych Disc (Opt)	B		1.0
RELG	219	Religion & Modern Fiction	A		3.0
Curr Credits		17.0 Grd Pts	56.400	GPA	3.318
Cuml Credits		32.0 Grd Pts	104.400	GPA	3.263

4th Year:

1996 Fall

School: College & Graduate Arts & Sci
Major: Interdisciplinary - Echols Scholar

ENTC	316	Modern Women Poets	A-		3.0
GFIR	351	West Europe in World Affairs	A		3.0
HILA	305	Modern Central America	B+		3.0
INST	480	Directed Study	CR		3.0
POL	521	Polish	B		3.0
RELG	360	Religion & Modern Theater	A		3.0
Curr Credits		18.0 Grd Pts	54.000	GPA	3.600
Cuml Credits		79.0 Grd Pts	259.600	GPA	3.416

Honor: Dean's List

1997 Spring

School: College & Graduate Arts & Sci
Major: Interdisciplinary - Echols Scholar

HIEU	313	World of Charlemagne	A-		3.0
HIUS	328	History of Virginia	A+		3.0
INST	480	Directed Study	CR		3.0
RELC	368	Catholic Pol & Soc Thought	A		3.0
Curr Credits		12.0 Grd Pts	35.100	GPA	3.900
Cuml Credits		91.0 Grd Pts	294.700	GPA	3.467

End of Undergraduate Record

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GPA Difference = 0.204 from 1st – 4th Year

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Reading Between the Transcript Lines

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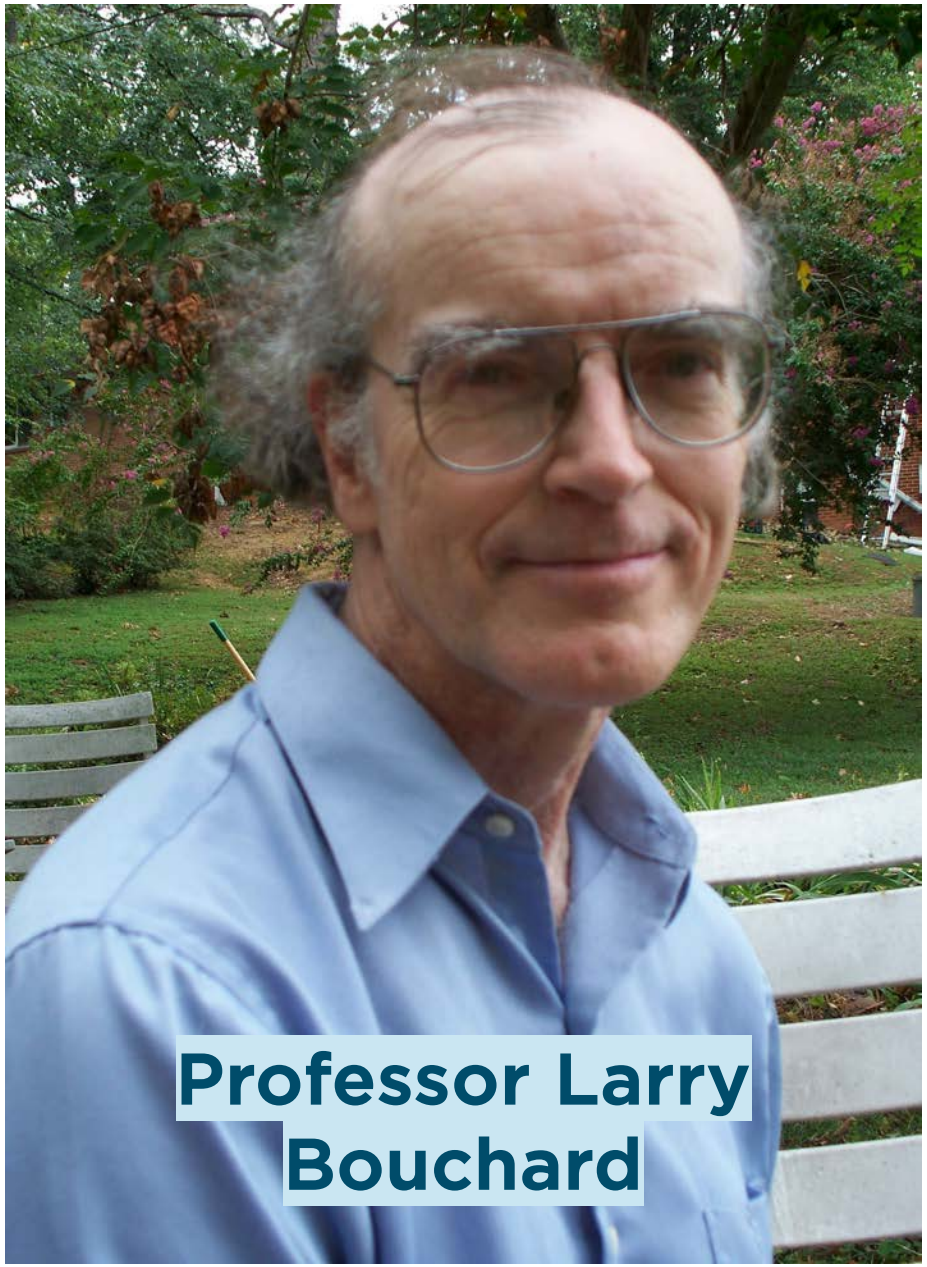


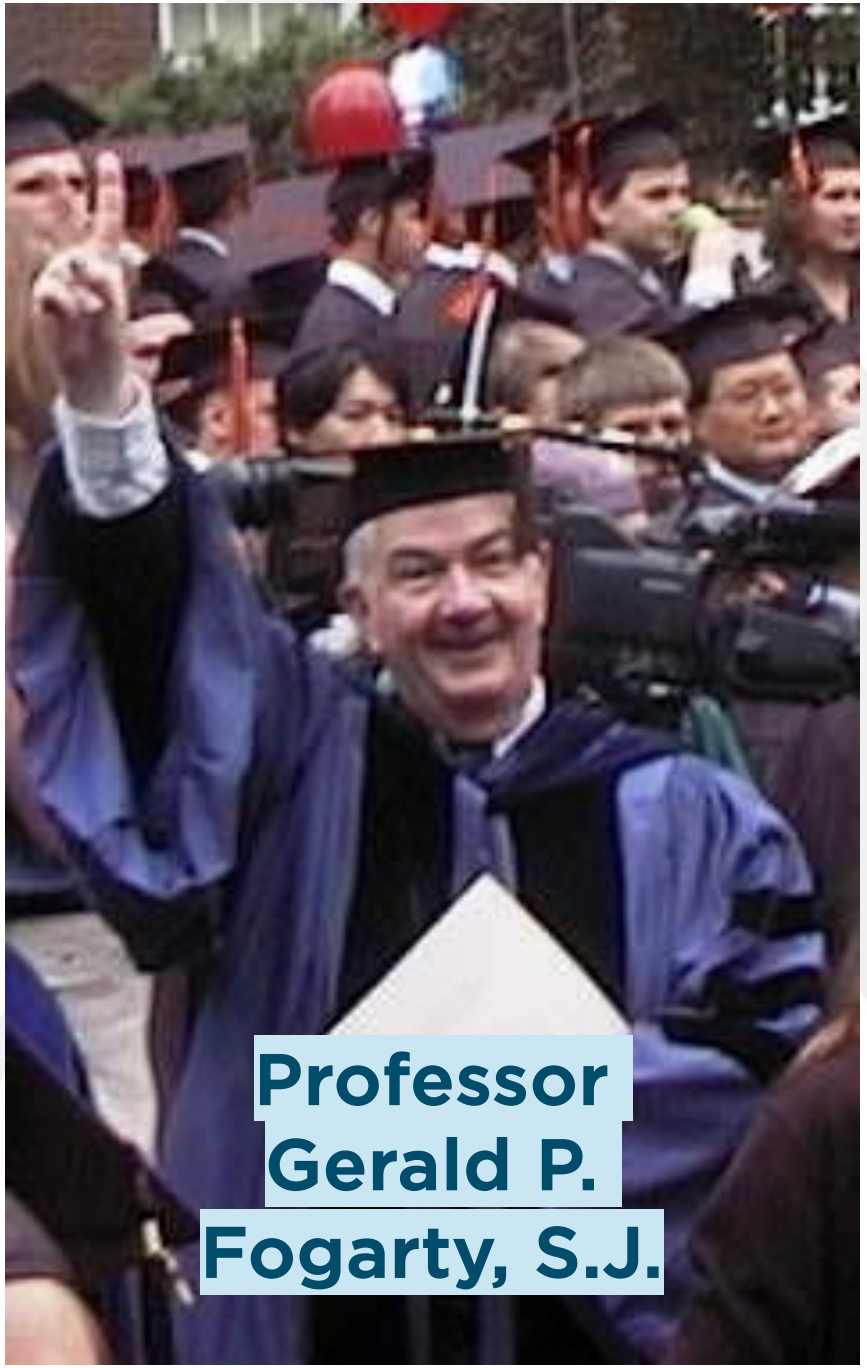
Professor Julian Bond



Professor Herbert Braun

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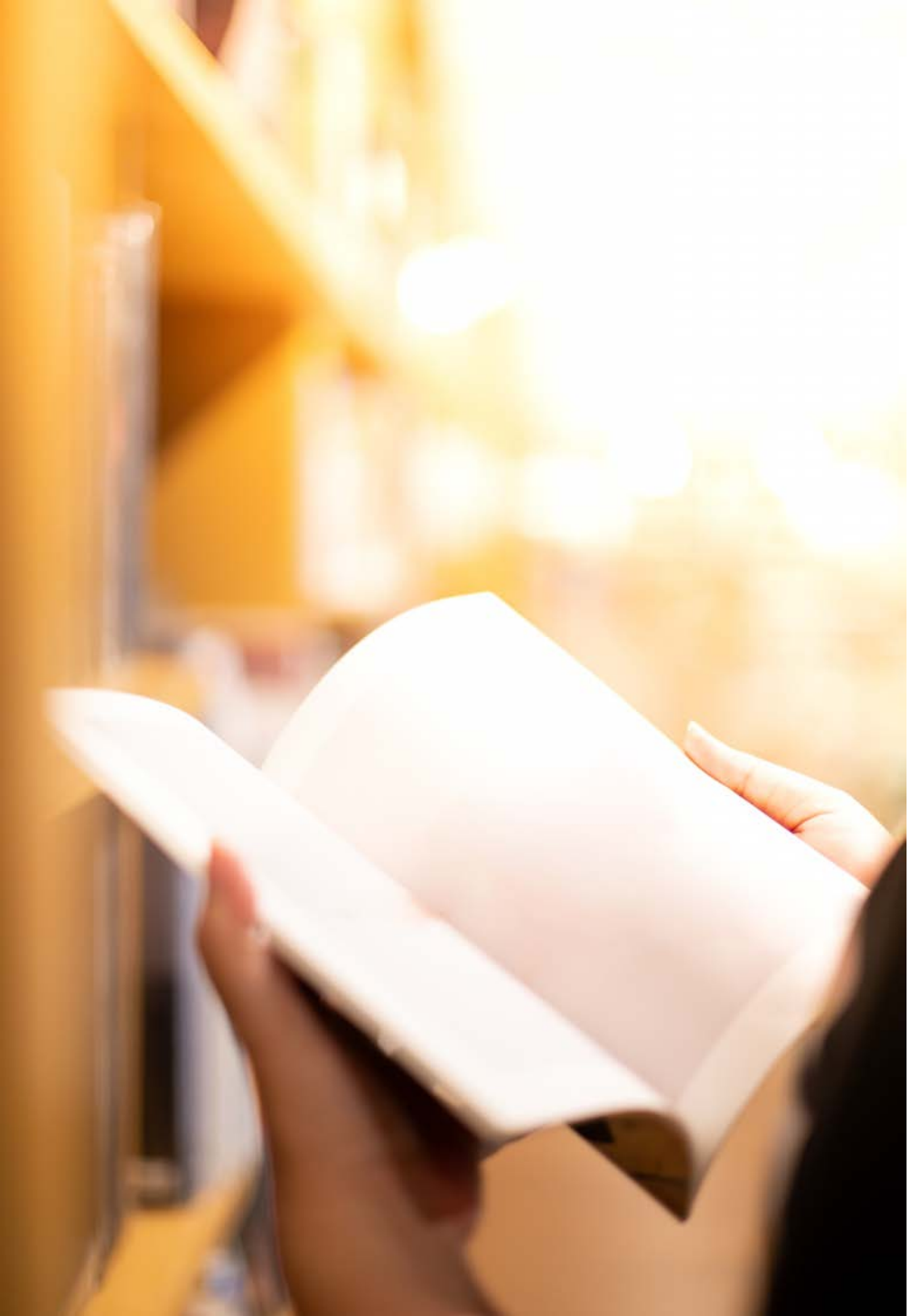
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123 credits @ graduation

-18 credits I remember

105 credits (other)

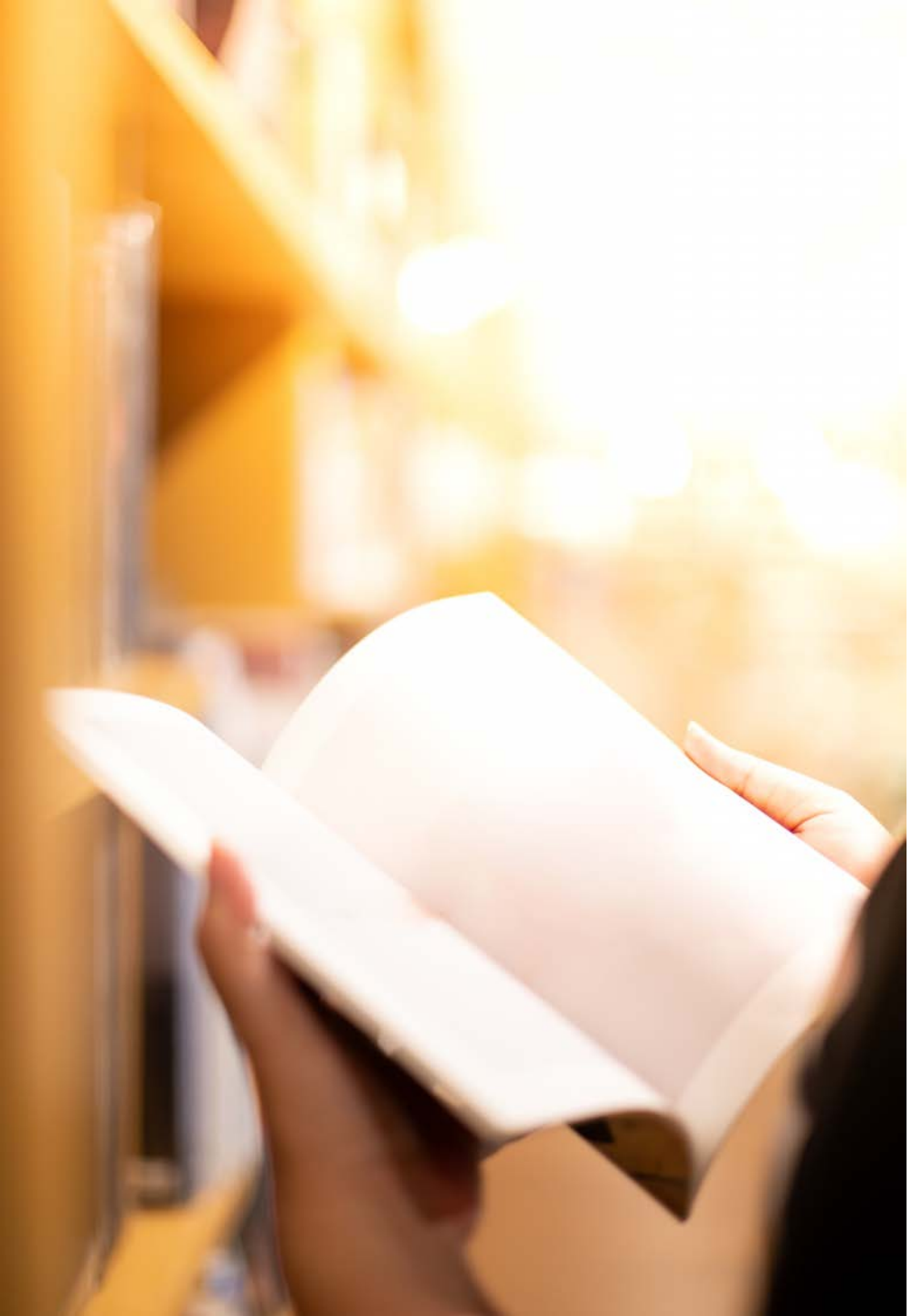
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What is your story as a learner?

What faculty had “main character energy” in your learning story?

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What would your transcript say about you?

What would it say “between the lines”?

What do you know now that you wish you knew then as a student?

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What is the purpose of college teaching?

Of higher education?

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What is the purpose of college teaching?

Long-term retention

"Knowledge, skills, and attitudes learned in college will be **recalled accurately** and **used appropriately in a new context** at some time in the future."

Transfer

(Halpern & Hakel, 2003)

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(Pollack, 2022)

An Experiment

Group A Instructions

Group B Instructions

https://bit.ly/group-A-instructions

- East Stroudsburg State
- Macaulay Honors College - CUNY
- Rhodes College
- St. Mary's College of Maryland
- United States Naval Academy

https://bit.ly/group-B-instructions

- Herbert H. Lehman College – CUNY
- Salem College
- Universidad De Los Andes
- University of Wisconsin-Oshkosh

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An Experiment

Pollack, 2022
https://pubmed.ncbi.nlm.nih.gov/38323067/

	YES	NO
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		

	YES	NO
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		
21.		
22.		
23.		
24.		

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Now, silently count backwards by threes from 200 for one minute.

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(Pollack, 2022)

You now have two minutes to write down as many of the 24 words as you can remember, in any order.



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(Pollack, 2022)

Here are the words. Count how many you wrote that are correct.

Evening	Pretty	Cold	Rich
Country	Expensive	Love	Nurse
Salt	Poor	Bargain	Pepper
Easy	Doctor	War	Hard
Peace	City	Hate	Ugly
Morning	Dry	Wet	Hot

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(Pollack, 2022)

GROUP A ONLY:

How many words did you write down correctly?

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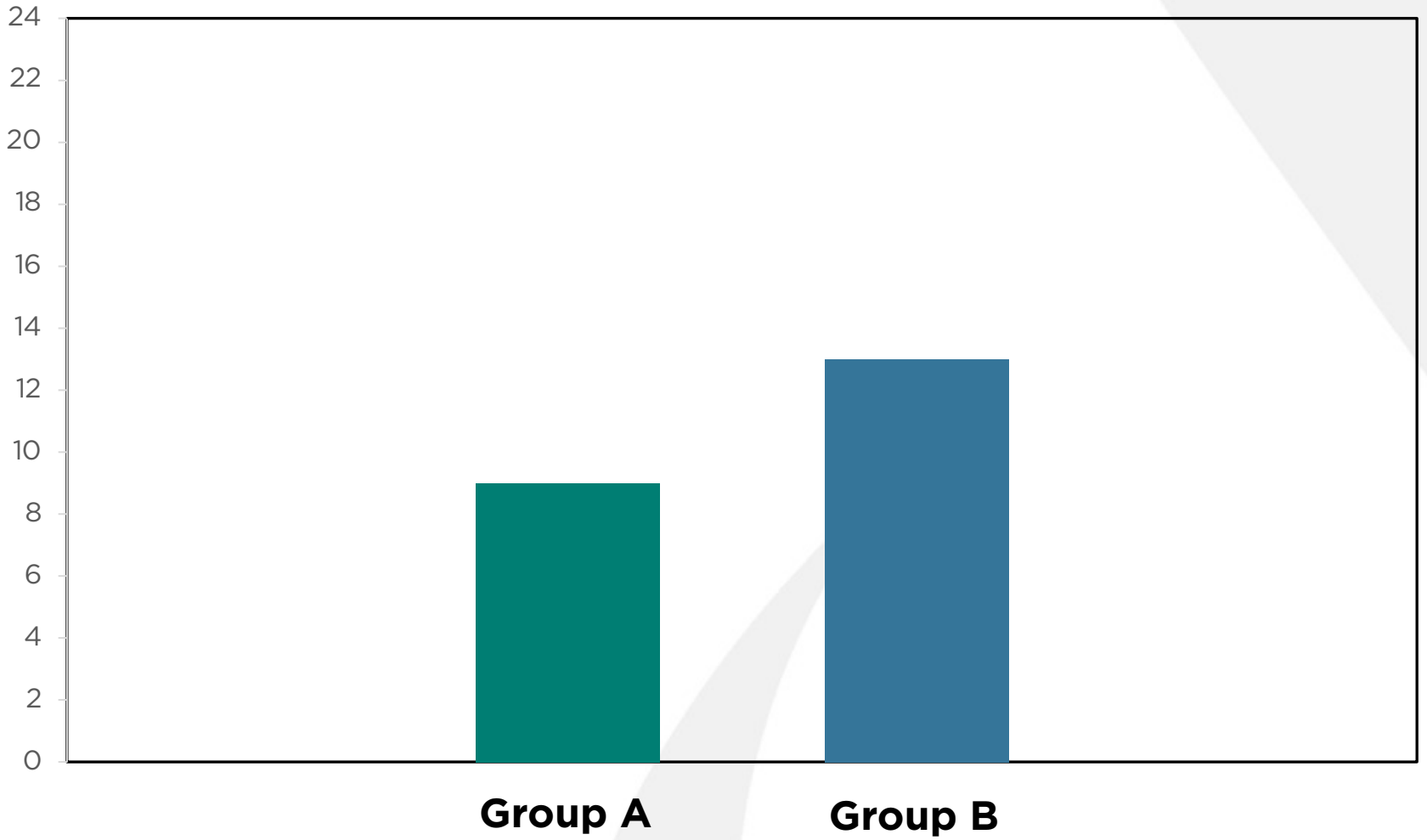
(Pollack, 2022)

GROUP B ONLY:

How many words did you write down correctly?

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What do we learn from this experiment?



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What we process, we learn.



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- ***Meaningful Learning***
- Imagery
- Elaborative Learning
- Self-Generation
- Self-Reference Effect
- Encoding Specificity



PROCESSING

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More meaningful,
higher-order

=

Harder to do

PROCESSING

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A "Simple" Equation:

Strategies + Processing = Learning



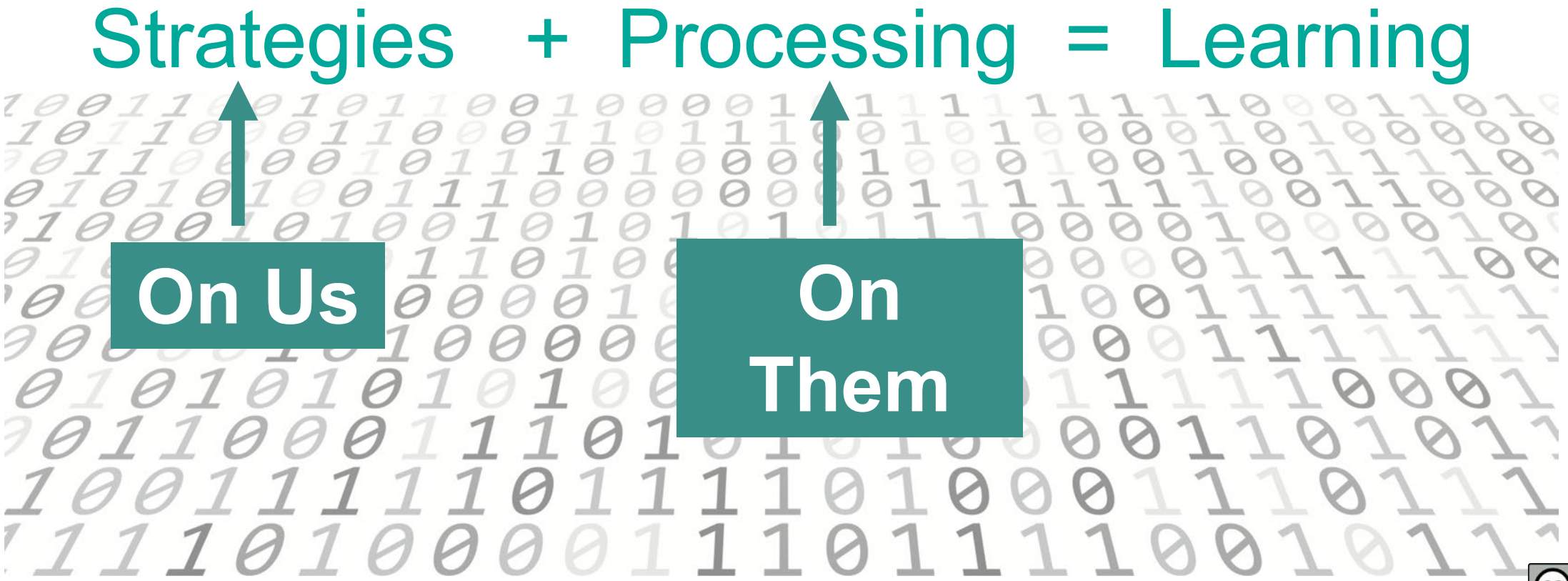
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A "Simple" Equation:

Strategies	+	Processing	=	Learning
What we do instructionally, assessments we design, and how we design programs and curriculum		What the students do when engaging in class or completing assignments		Change in knowledge, beliefs, behaviors, or attitudes that unfold over time

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A "Simple" Equation:



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The Transfer Gap
LEARNING
APPLICATION
What are techniques for enhancing transfer and encoding?
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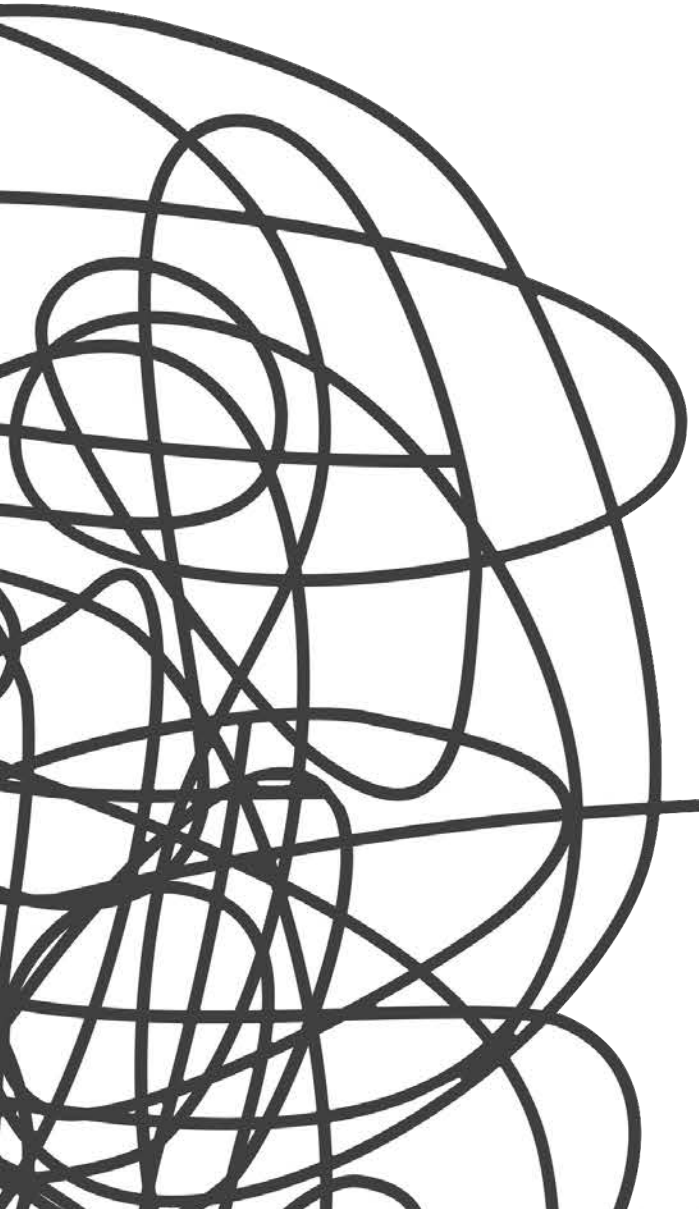
Enhancing Transfer and Encoding

- Give students time and space to do hard things
- Scaffold
- Allow students to meaningfully reflect

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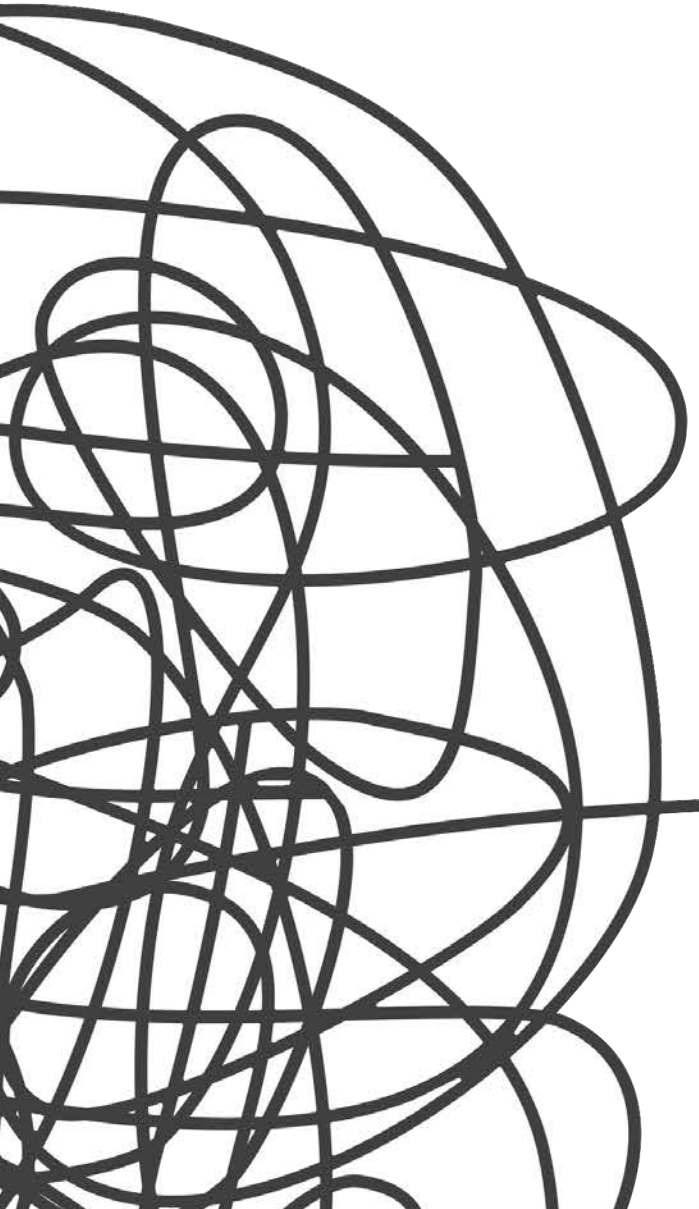
A Core Deweyan Principle:

Experience alone does not produce learning, but reflection on experience is what makes it meaningful.



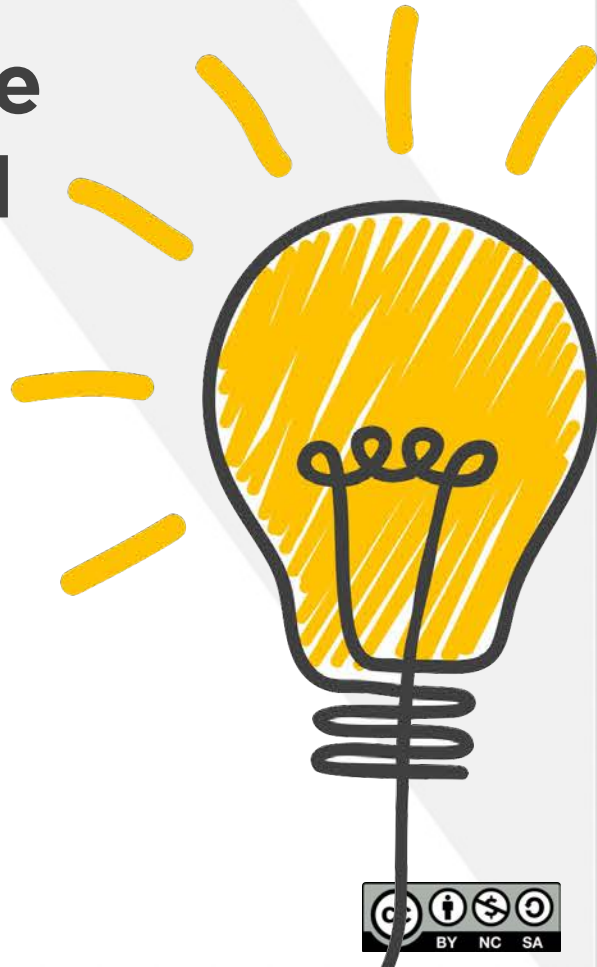


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Reflective Thinking **is "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends."**

– John Dewey (1933)



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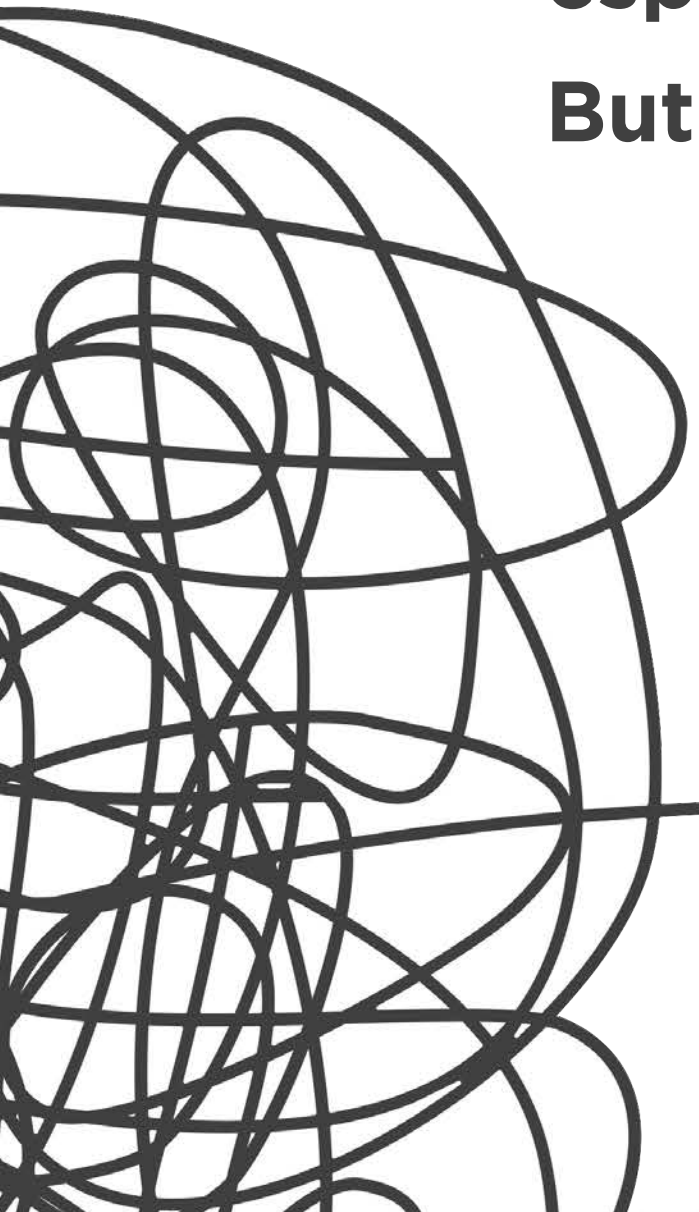
Meaningful encoding is necessary, especially for complex tasks.

But it's hard.

Meaningful reflection isn't innate.

It's learned.

And meaningful, deep reflection is also hard.



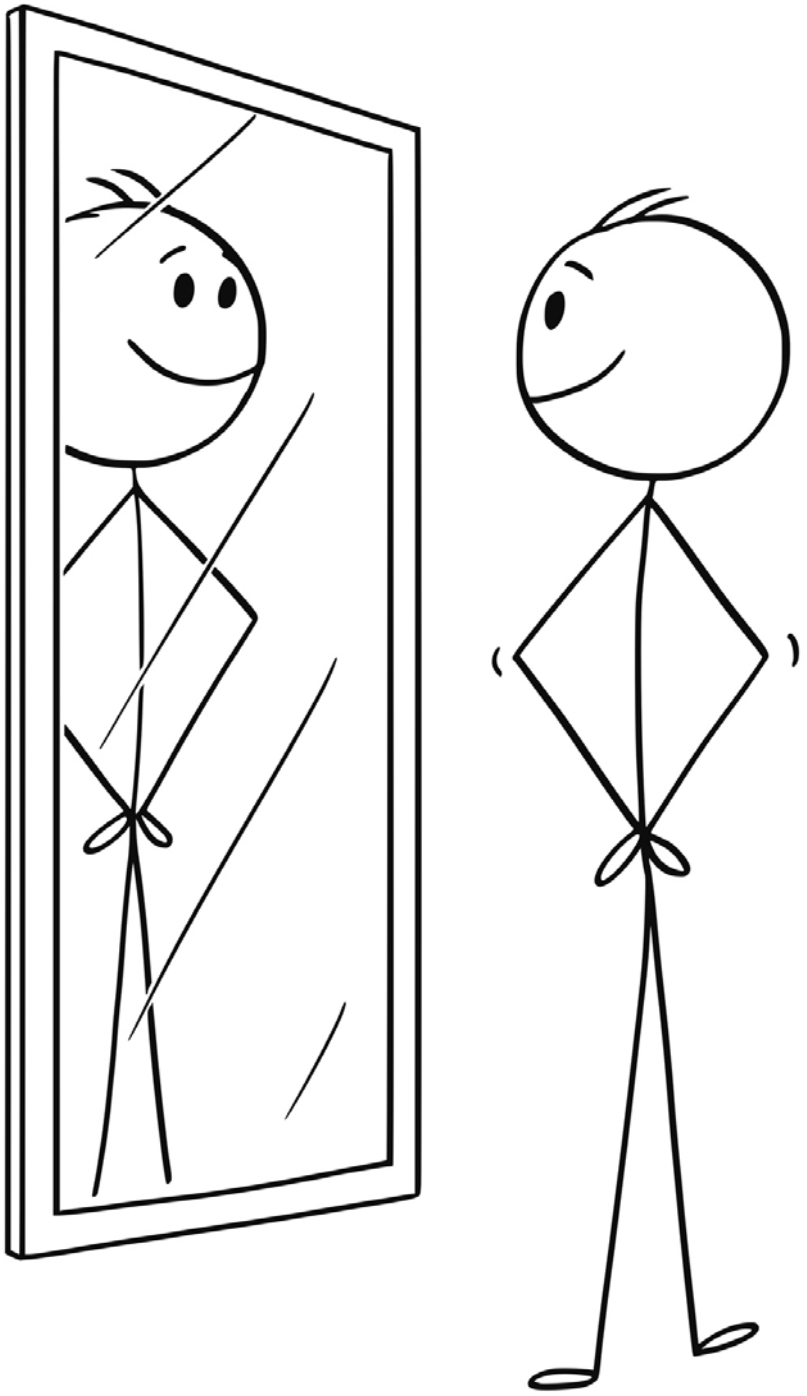


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How do we get to high impact?

1. **Reflect** on your path as a learner
2. **Own** who you are as a professional
3. **Stretch** to be what your students/ colleagues/institution needs
4. **Support and challenge** one another

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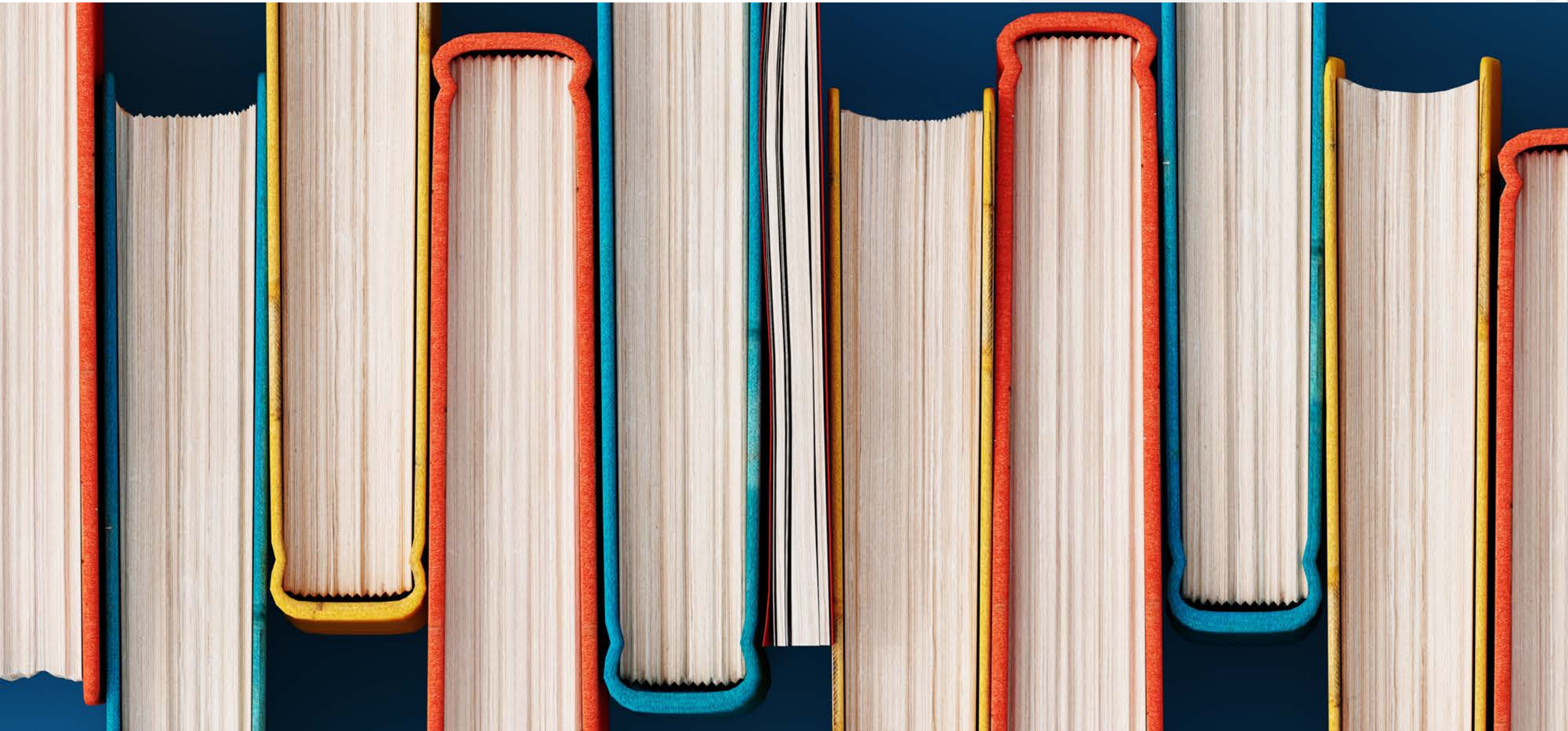


#2

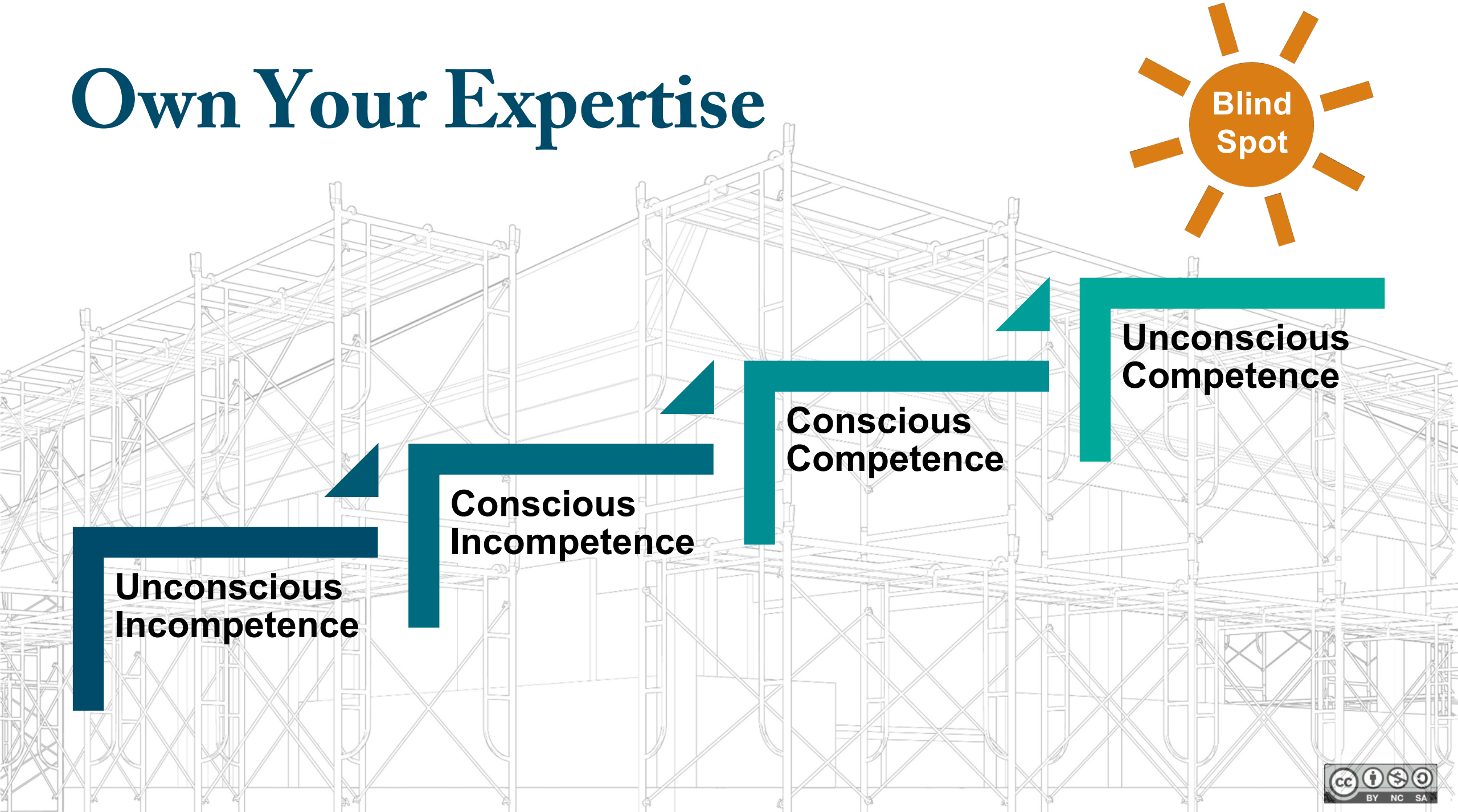
Own.

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Model the learning we expect of our students.



Own Your Expertise



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Epistemology.

Own your expertise.

Metacognition.

Self-Regulation.

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But don’t traffic in *jargon*.

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Debunk myths.

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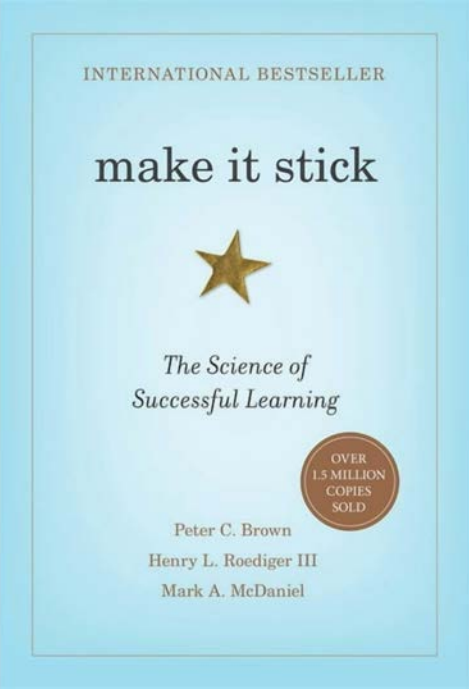
Learning styles.

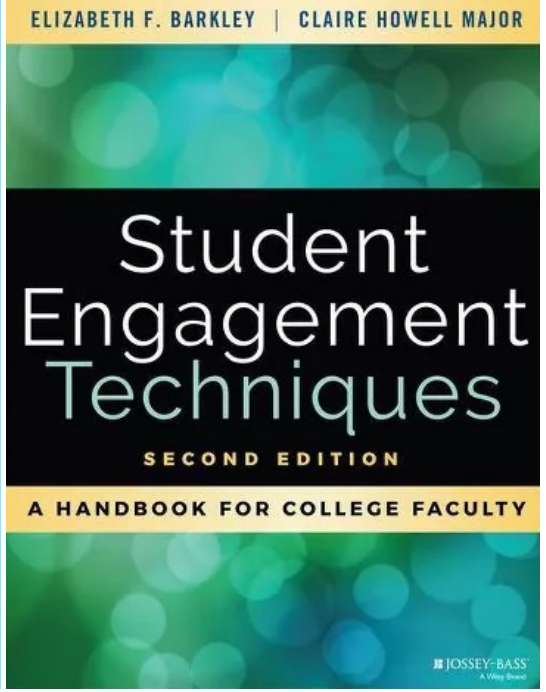
Multiple Intelligences.

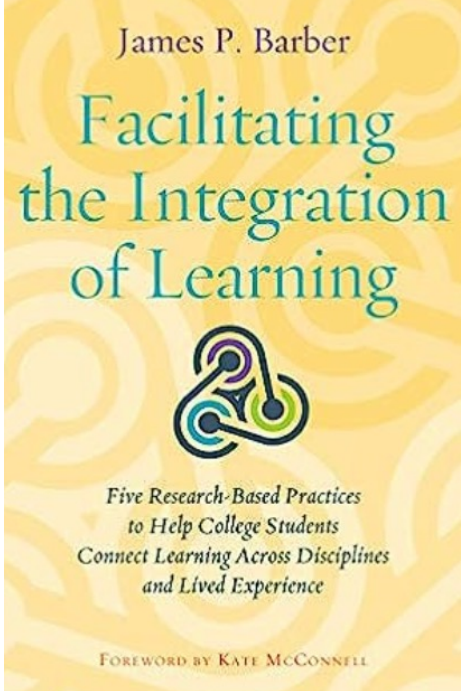
Multi-Tasking.

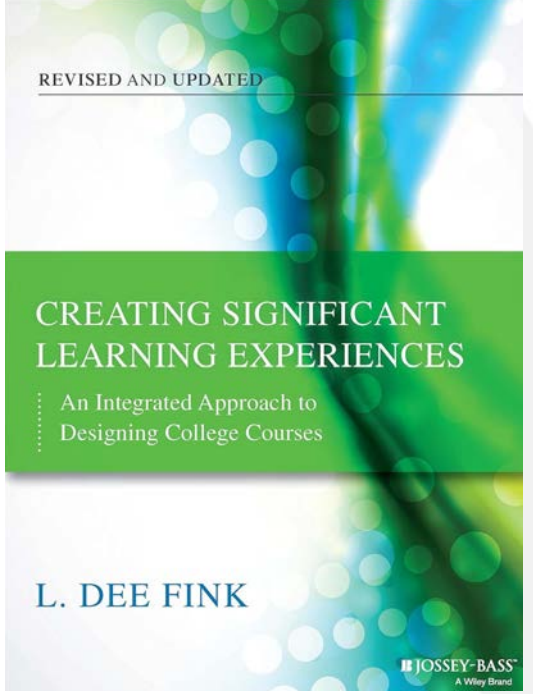
Digital Natives.

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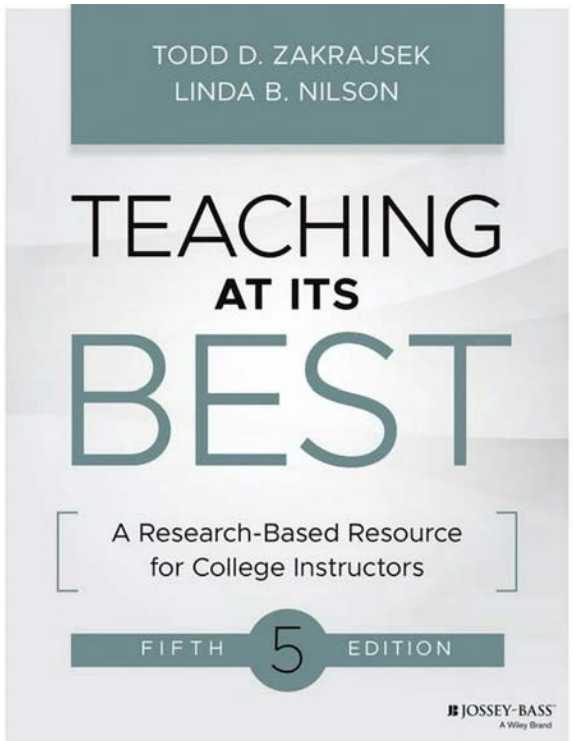

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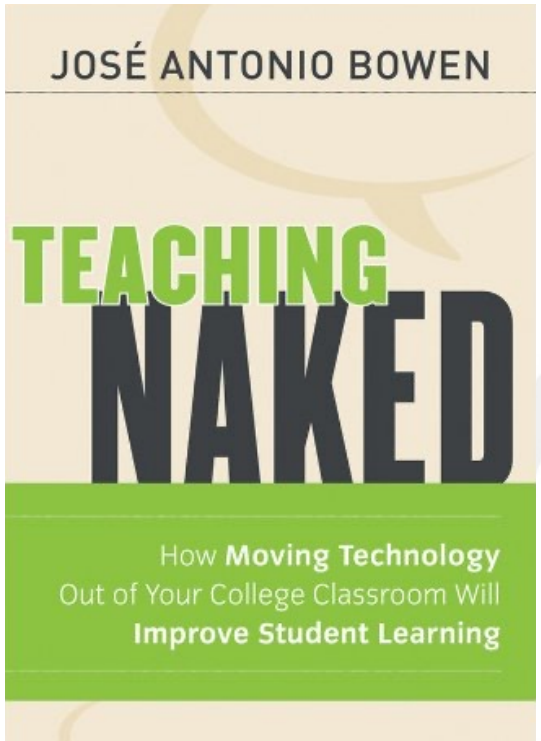

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A HANDBOOK FOR COLLEGE FACULTY
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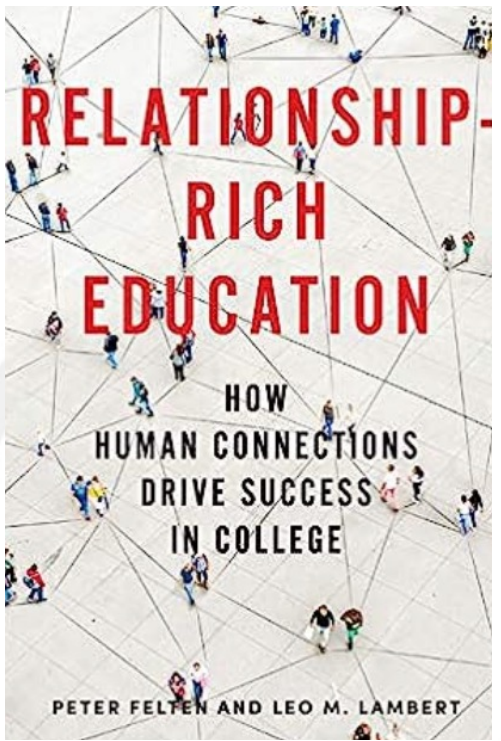

James P. Barber
Facilitating the Integration of Learning
Five Research-Based Practices to Help College Students Connect Learning Across Disciplines and Lived Experience
FOREWORD BY KATE MCCONNELL

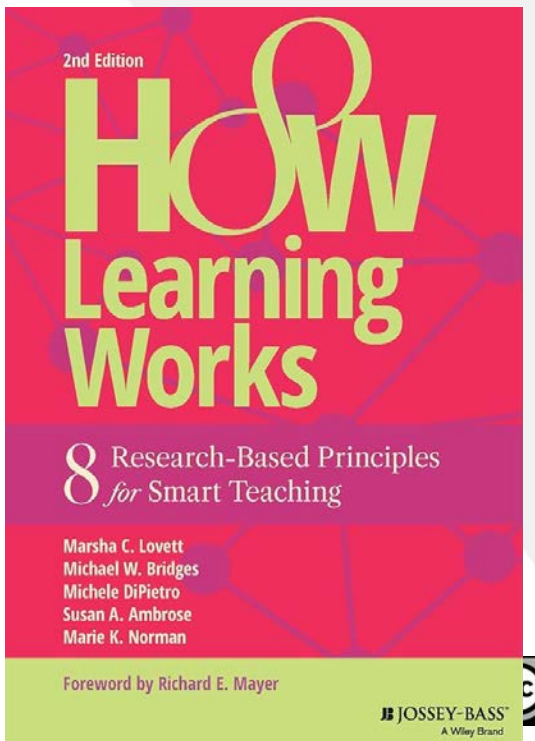

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An Integrated Approach to Designing College Courses
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And take the “strawman” head on.



~~R~~r.

Academic ~~F~~eedom.

Interra~~t~~reliability.

“Fill-in-~~th~~e-blank”

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Our Promise:

A well-designed, course-embedded approach to assessment can **catalyze critical conversations**, serve as fodder for **improving instruction**, provide the evidence necessary for **SoTL** endeavors, and **satisfy accreditation/ accountability** mandates, all while maintaining academic rigor and freedom.

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How do we get to high impact? Session 2:

1. **Reflect** on your path as a learner
2. **Own** who you are as a professional
3. **Stretch** to be what your students/ colleagues/institution needs
4. **Support and challenge** one another

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#3 - Stretch.

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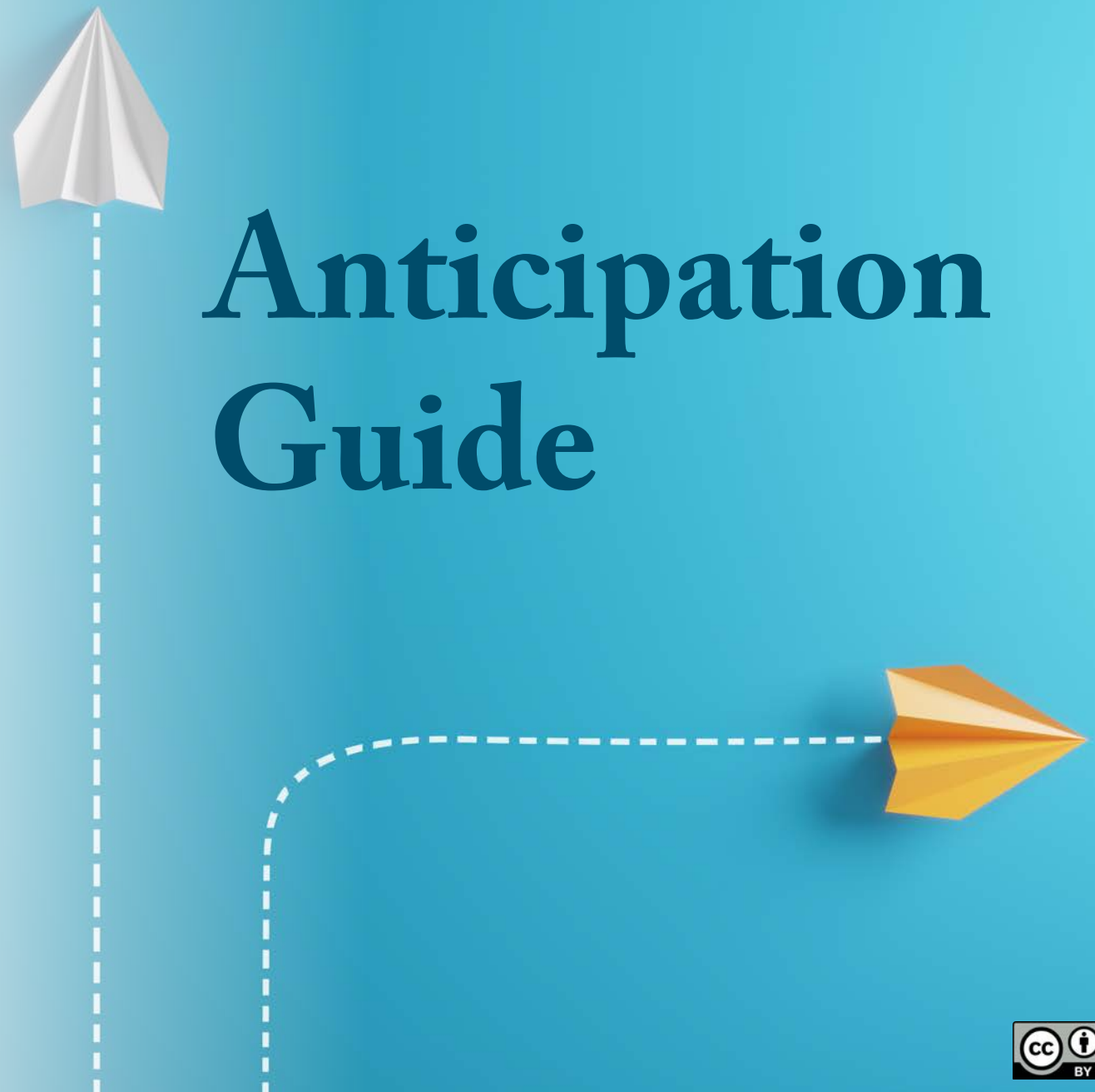
ACTIVITY

I’m going to present you with a series of statements.

For each statement, **indicate how much you agree or disagree:**

- If you **agree** with the statement, toggle to the agree end (10).
- If you **disagree** with the statement, toggle to the disagree end (1).
- Feel free to also land somewhere in the middle!

Anticipation Guide



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You can improve your assessment process even before you have data.

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Assessment is mostly about box checking and satisfying accreditors.

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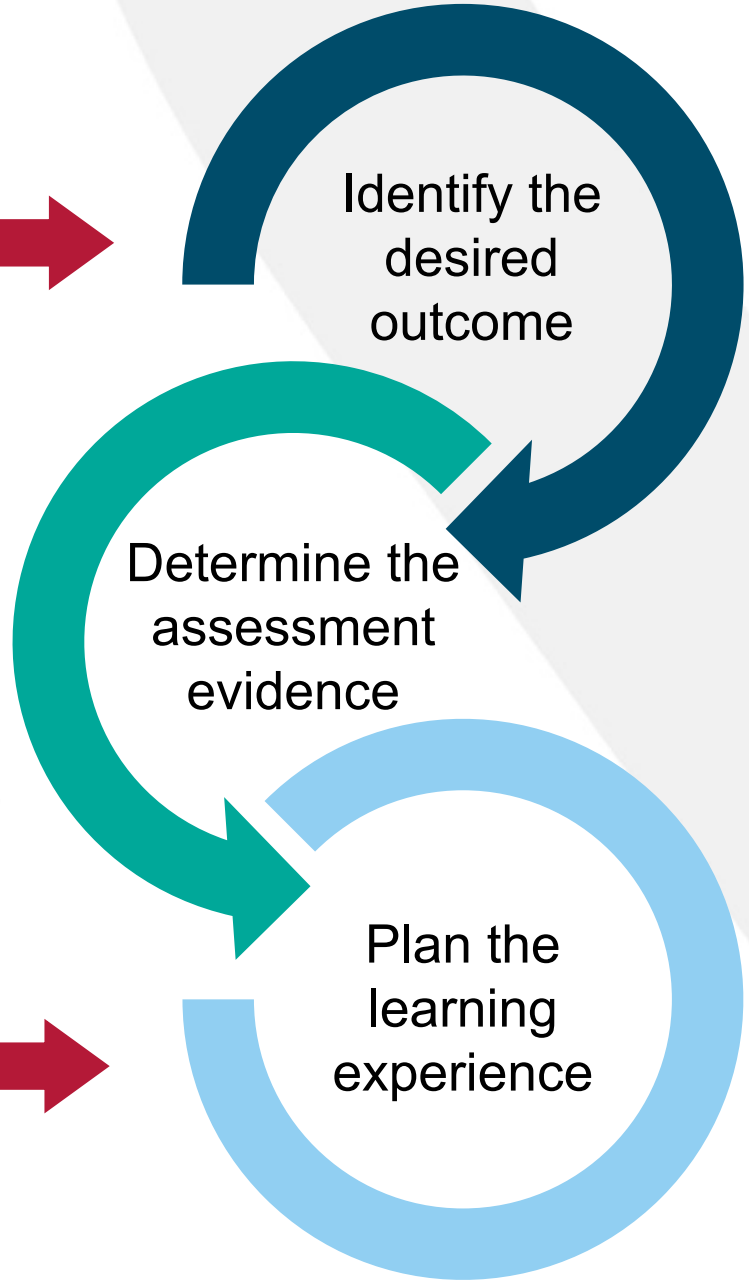
There is no magic.

We make these things happen by design.

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Backward Design

- What outcome(s) are you interested in assessing?
- How will students demonstrate the outcome?
- What does success look like?
- Consider how students learn and process information.

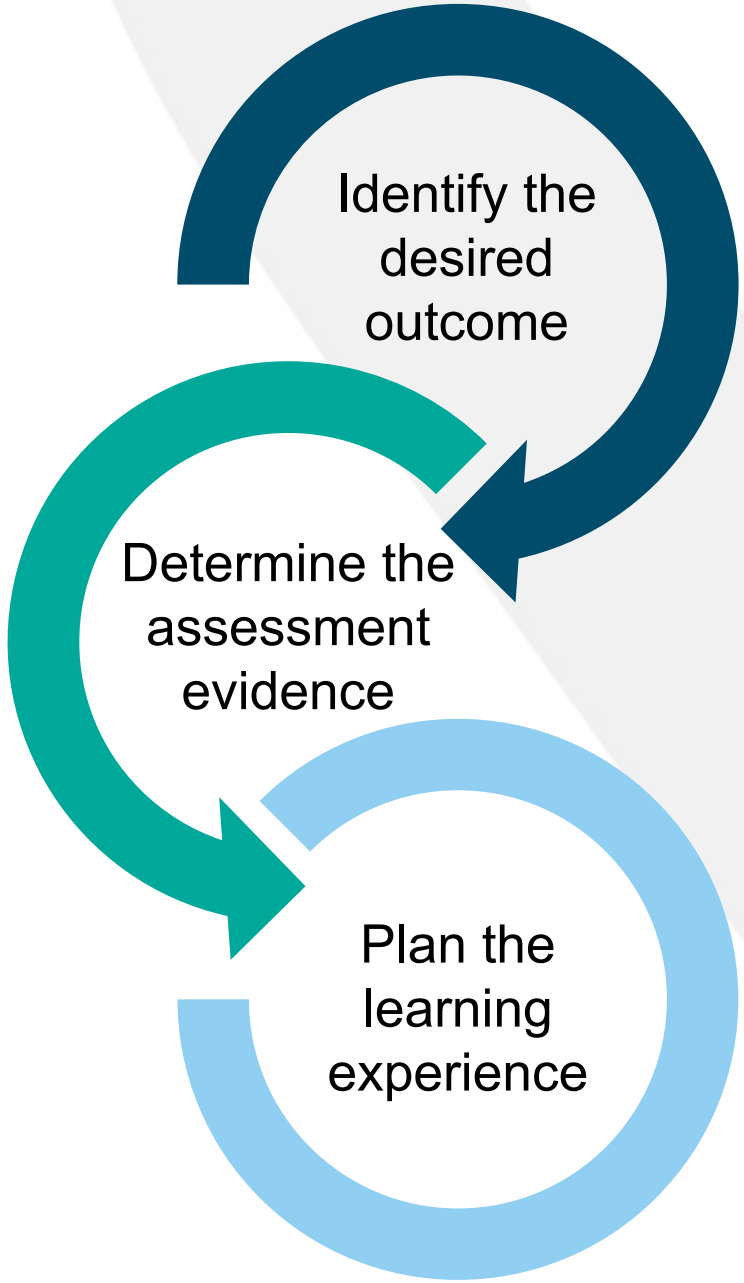


(Wiggins & McTighe, 1998)

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This is where learning sciences meets assessment.

The evidence step is where measurement lives.

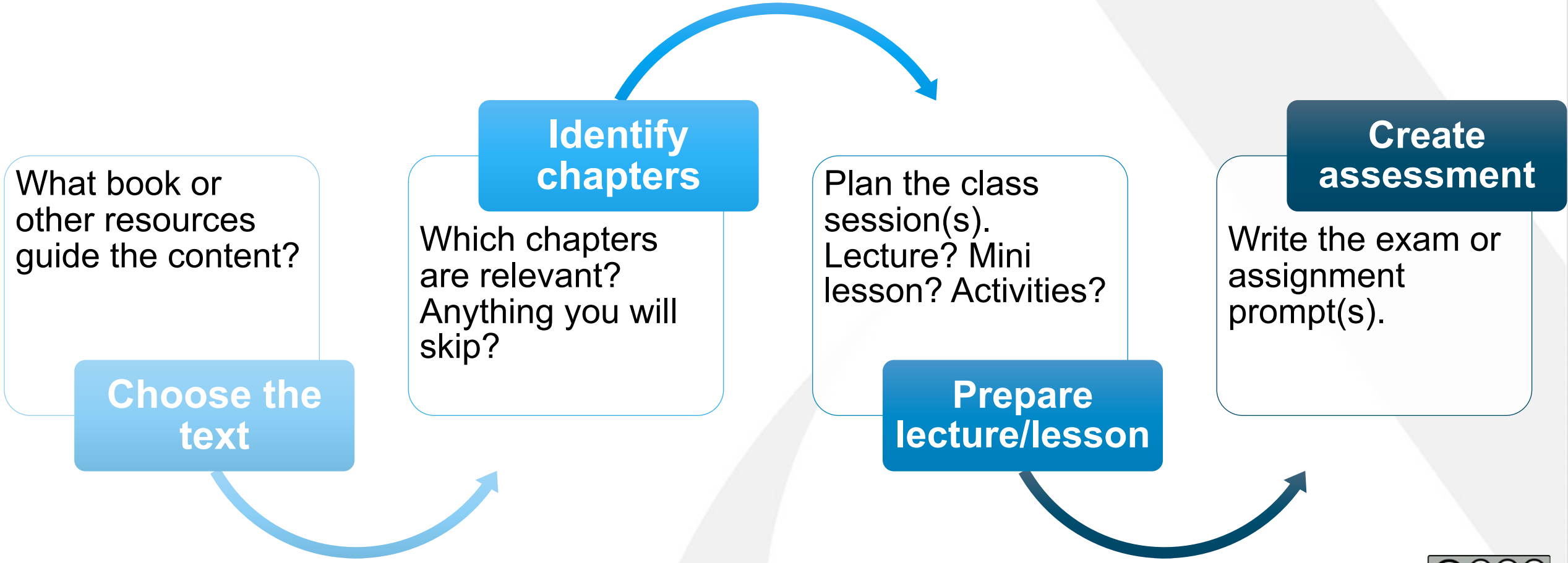


(Wiggins & McTighe, 1998)

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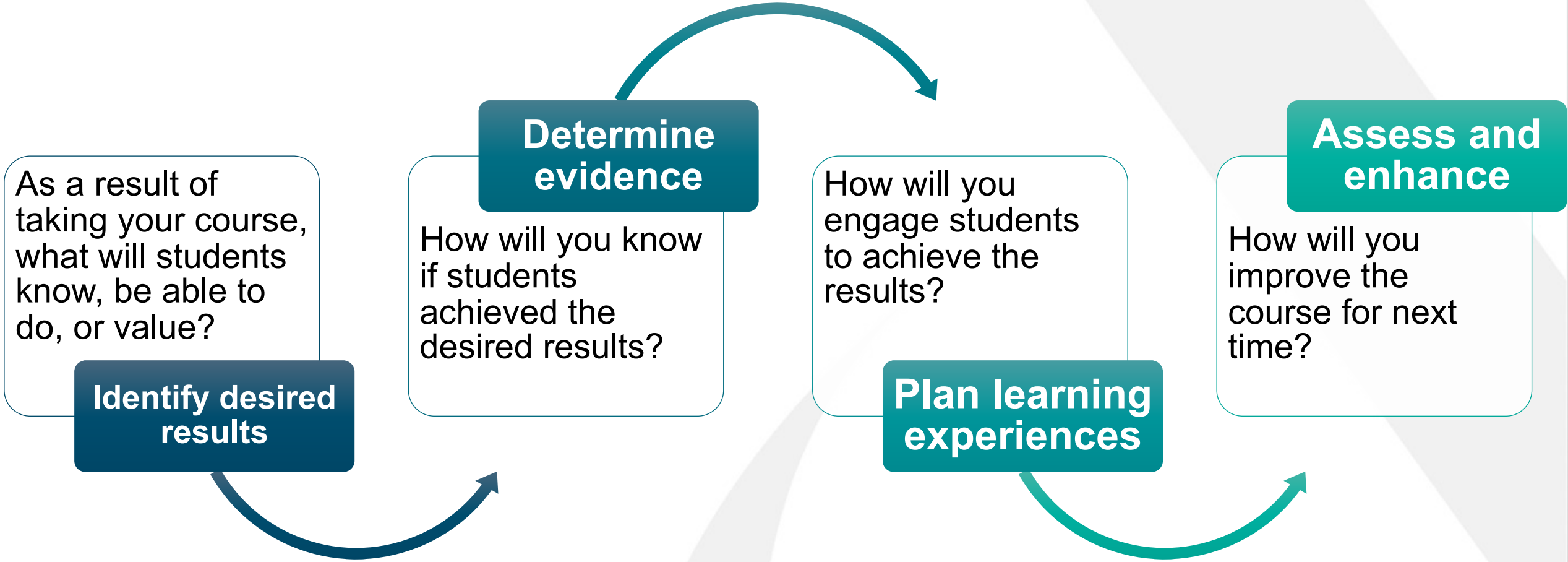
Common Approach to Course Design: Content-Centered

- Content-centered approach
- “List of topics” approach



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Backward Course Design



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Before data, there is design.

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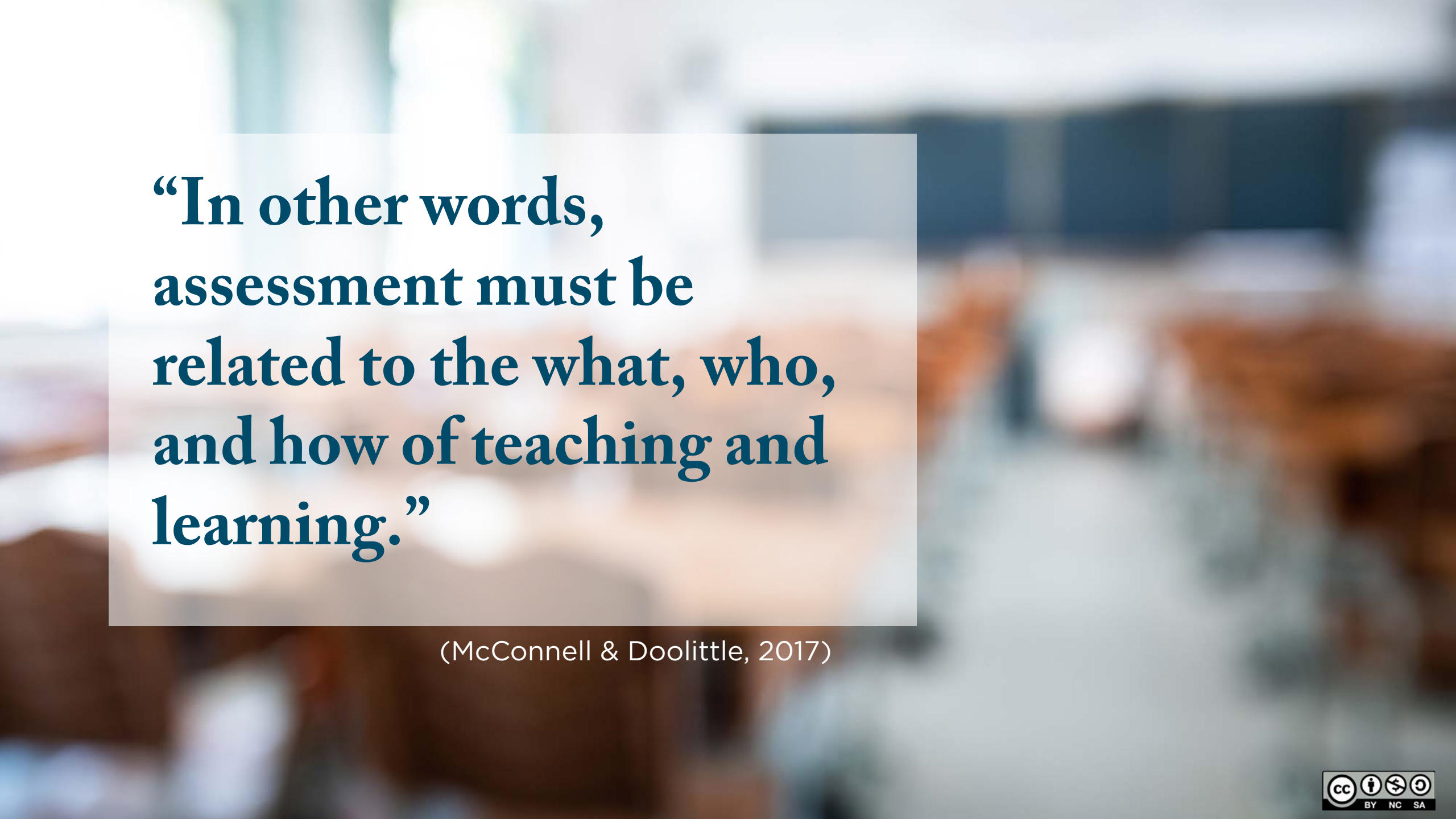
Naming it High-impact does not make it so.

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"For classroom assessment to generate **meaningful information**, all aspects of the classroom experience **must align pedagogically**: course outcomes, course content, the learners themselves, the instructional and performance contexts, and the pedagogical strategies used."

(McConnell & Doolittle, 2017)

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“In other words, assessment must be related to the what, who, and how of teaching and learning.”
(McConnell & Doolittle, 2017)

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All about alignment

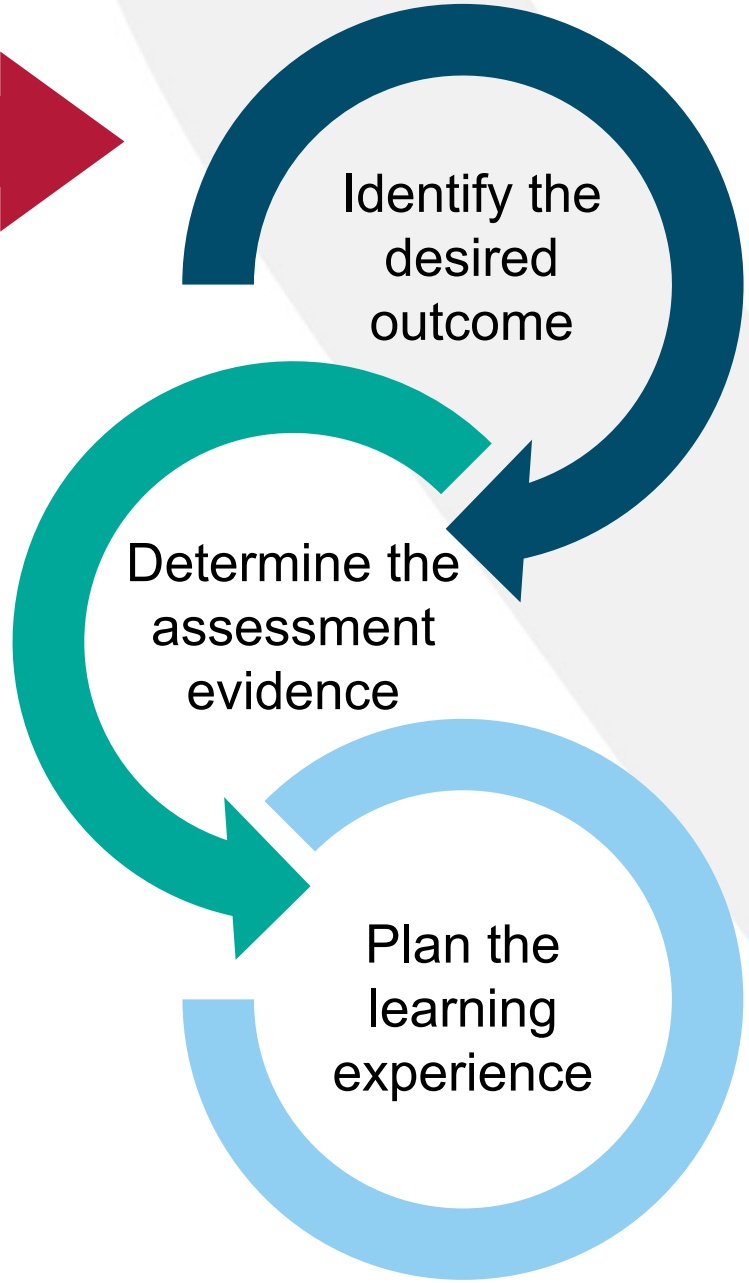


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Now, how do we measure learning and student success?

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For starts, a shared sense of "the end"



(Wiggins & McTighe, 1998)

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Is it “teaching to the test” or TILT?

TILT Higher Ed
TRANSPARENCY IN LEARNING & TEACHING

TILT is a research-backed framework for designing assignments that make expectations clear and accessible to all students.

Why it Matters

\ Boosts student confidence
\ Leads to stronger, more focused work
\ Promotes greater equity in learning outcomes

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Let's talk evidence.



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Evidence “Smell Test”



1. Are the data important? Or just interesting?
2. Do the data align meaningfully with your strategies? With your outcomes?
3. Do the data represent all of your students? Who might be left out?
4. In your design, have you allowed the “perfect” to be enemy of the “good”?

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- Move beyond the mean.
- Rubrics data—qualitative or qualitative?
- Data are not value-neutral.
- Outliers warrant attention.
- You must ask the tough question: Does your approach marginalize some students?
- Just as the learning sciences inform pedagogy, how might they enhance assessment (e.g., mindsets, stereotype threat)?



How do we get to high impact?

1. **Reflect** on your path as a learner
2. **Own** who you are as a professional
3. **Stretch** to be what your students/ colleagues/institution needs
4. **Support and challenge** one another



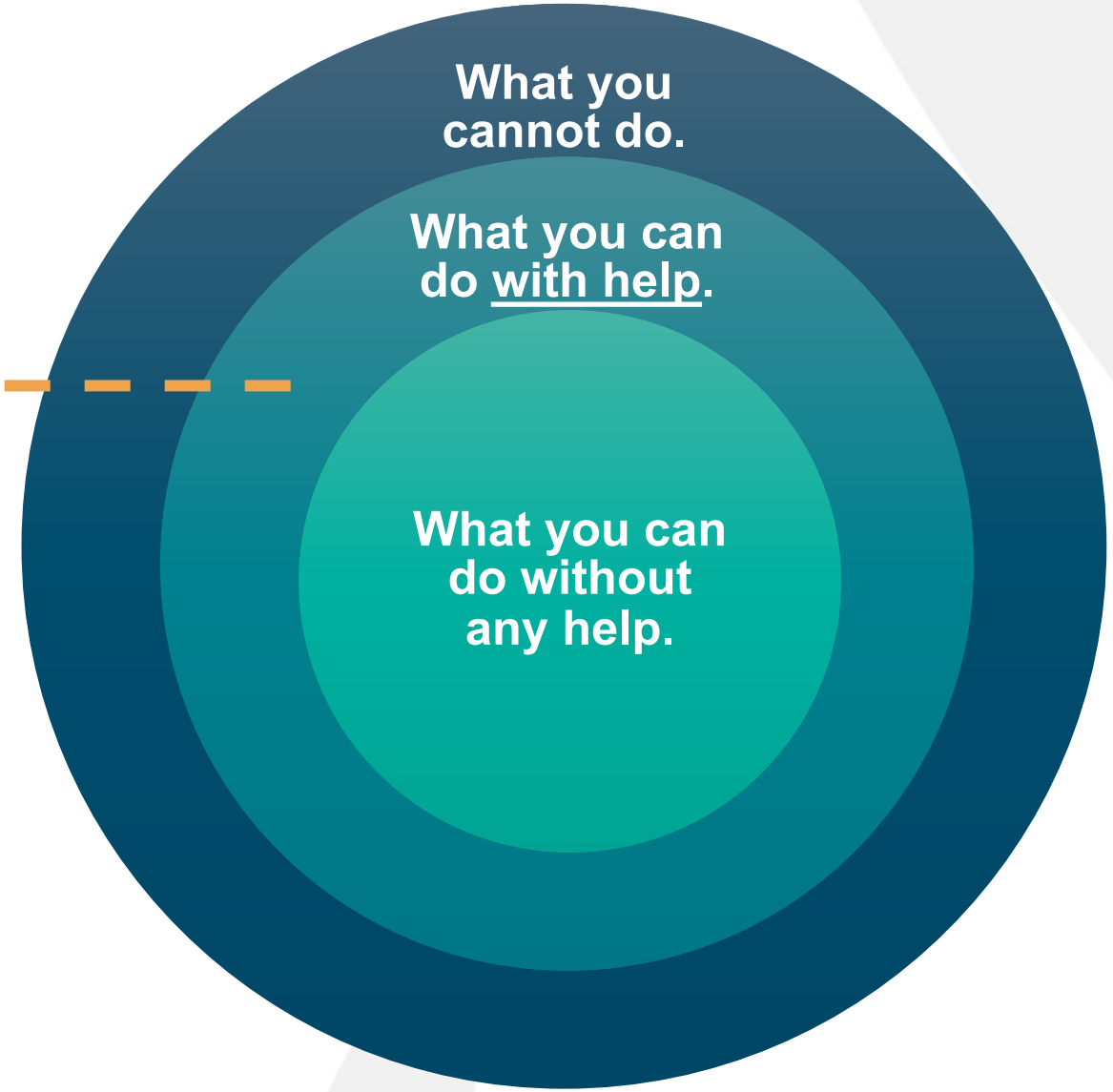
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#4
Support.
Challenge.




development
ZONE
COMFORT
ZONE

Zone of Proximal Development (ZPD)



The sweet spot for learning (faculty + students)

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Avoid the fundamental attribution error.

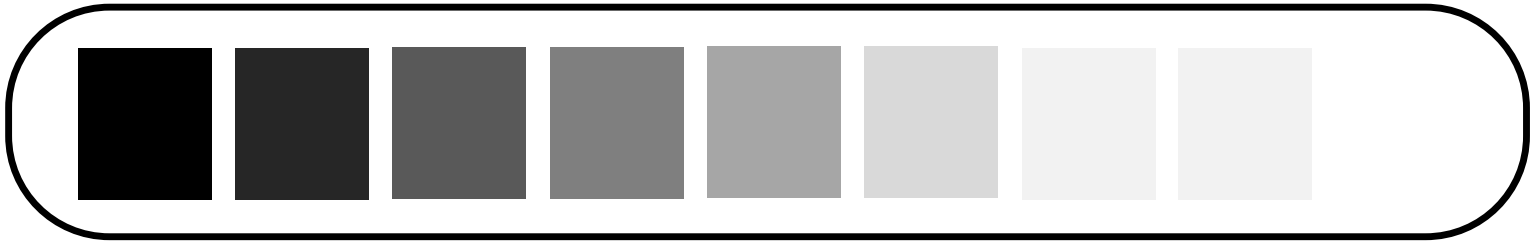
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"I am urging that we avoid the fundamental attribution error and look first to the **structure of the work** rather than the personalities of the workers for the source of the resistance to change."

John Tagg, Change Magazine, Jan/Feb 2012

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LOADING . . .



EMPATHY

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Understand that *faculty* are key players in any assessment initiative, and as assessment leaders, you can support and challenge them as well as one another.

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What Faculty Need for Innovation to Work

- **Clear goals** that connect to what you already care about.
- **Time and space** to learn, experiment, and ask questions.
- **Institutional support** that's real, sustained, and visible.
- **Recognition** for your effort, professionally and formally.

(Furco & Moely, 2012)

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What do you think?

Can assessment be a HIP?



Performance expectations set at appropriately high levels



Frequent, timely, and constructive feedback



Significant investment of time and effort by students over an extended period



Periodic, structured opportunities to reflect and integrate learning



Interactions with faculty and peers about substantive matters



Opportunities to discover relevance of learning through real-world applications



Students are exposed to and must contend with people and circumstances that are unfamiliar



Public demonstration of competence

(Kuh & O'Donnell, 2013)

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What about your assessment process is already on the way to being a HIP?



Performance expectations set at appropriately high levels



Significant investment of time and effort by students over an extended period



Interactions with faculty and peers about substantive matters



Students are exposed to and must contend with people and circumstances that are unfamiliar



Frequent, timely, and constructive feedback



Periodic, structured opportunities to reflect and integrate learning



Opportunities to discover relevance of learning through real-world applications



Public demonstration of competence

(Kuh & O'Donnell, 2013)

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Questions?

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