Change and Adoption:
Scaffolding Your New Faculty Workshop Experience

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- Scaffolding
- Transparency

Scaffolding: National Research Council 2015
Transparency: Winkelmes et al. 2016

Build a useful scaffold for your NFW experience

- Anticipate steps in **building teaching expertise**
- Apply a framework for **making wise instructional choices**
- Identify aspects of **your context** that matter most

Plan:

1. **Developing expertise**
2. Wise instructional choices
3. Context matters

University science teaching is changing

University science teaching is changing

1. Developing Expertise

RBISs

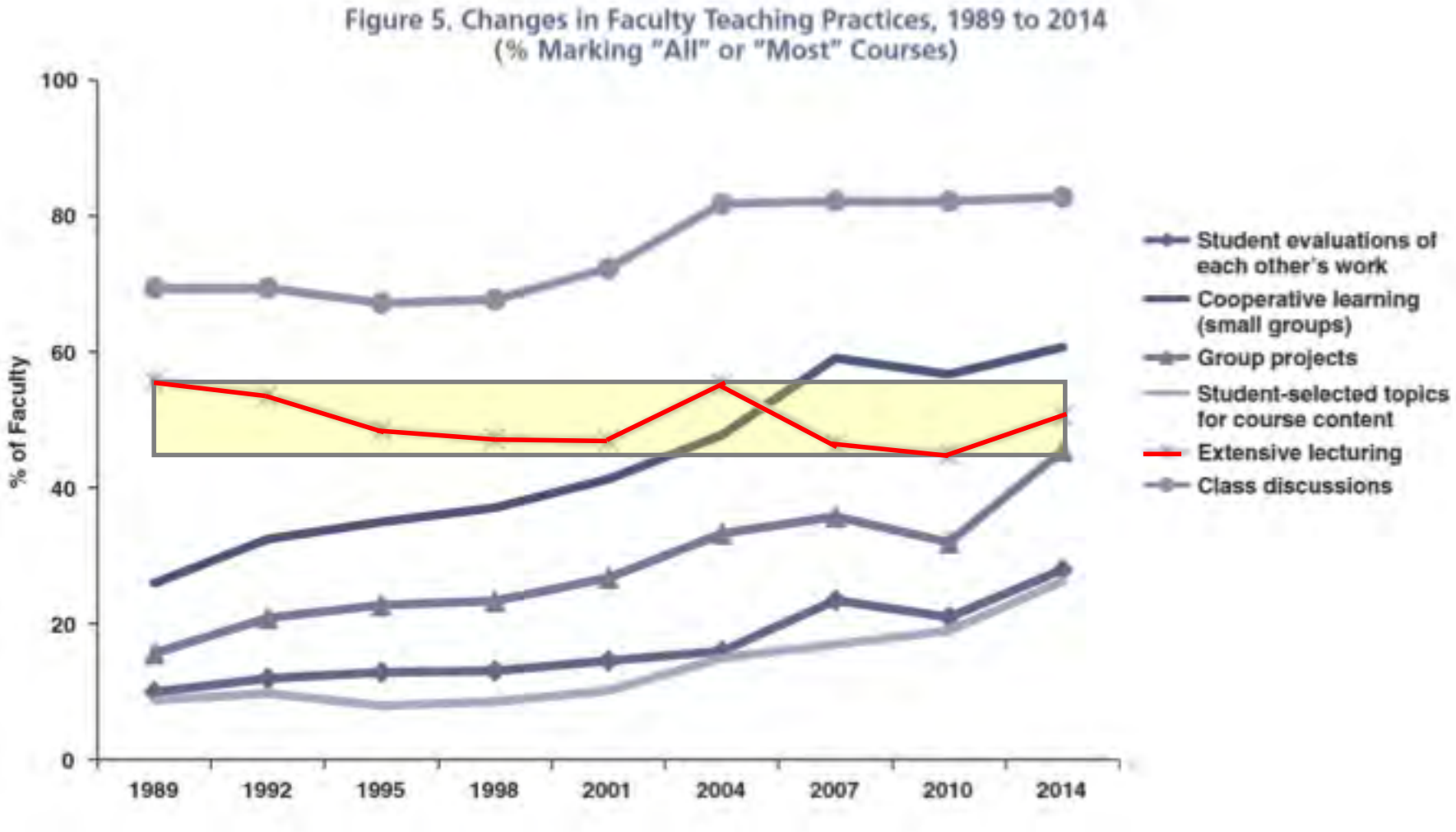
Research Based Instructional Strategies

Close relatives:

EBIPs

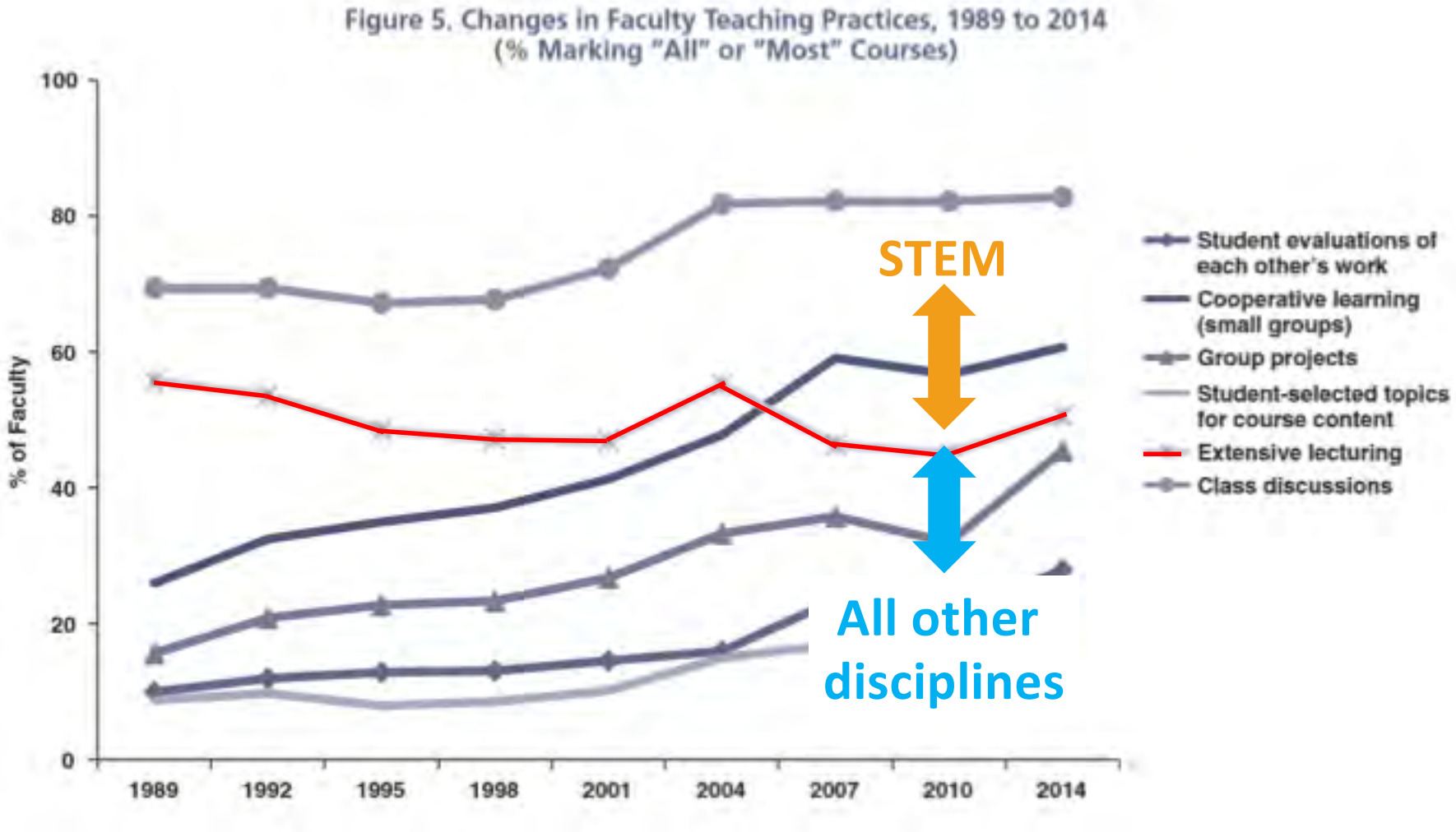
Evidence Based Instructional Practices

All Disciplines: 2014 HERI Faculty Survey



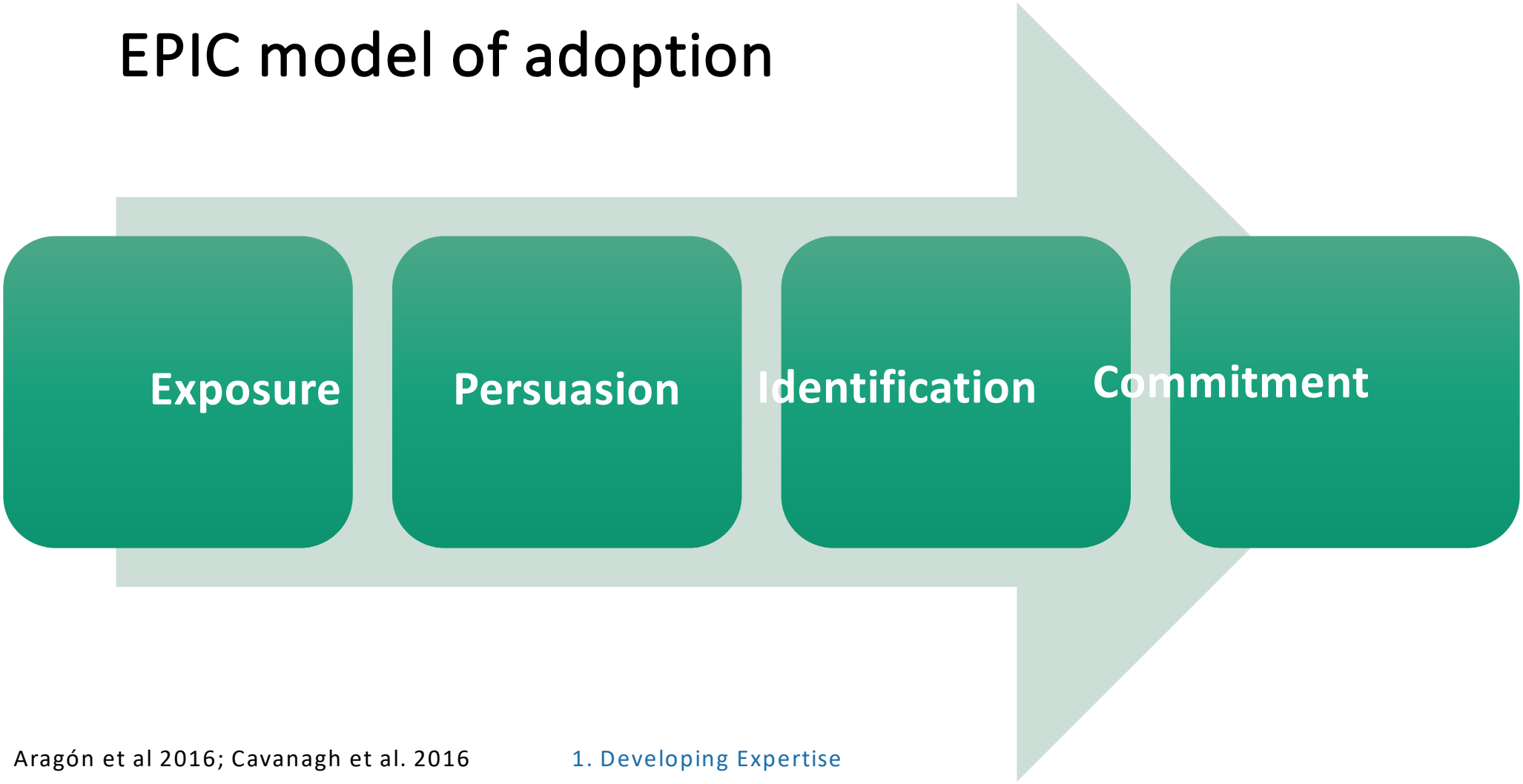
Eagan et al. 2016

All Disciplines: 2014 HERI Faculty Survey



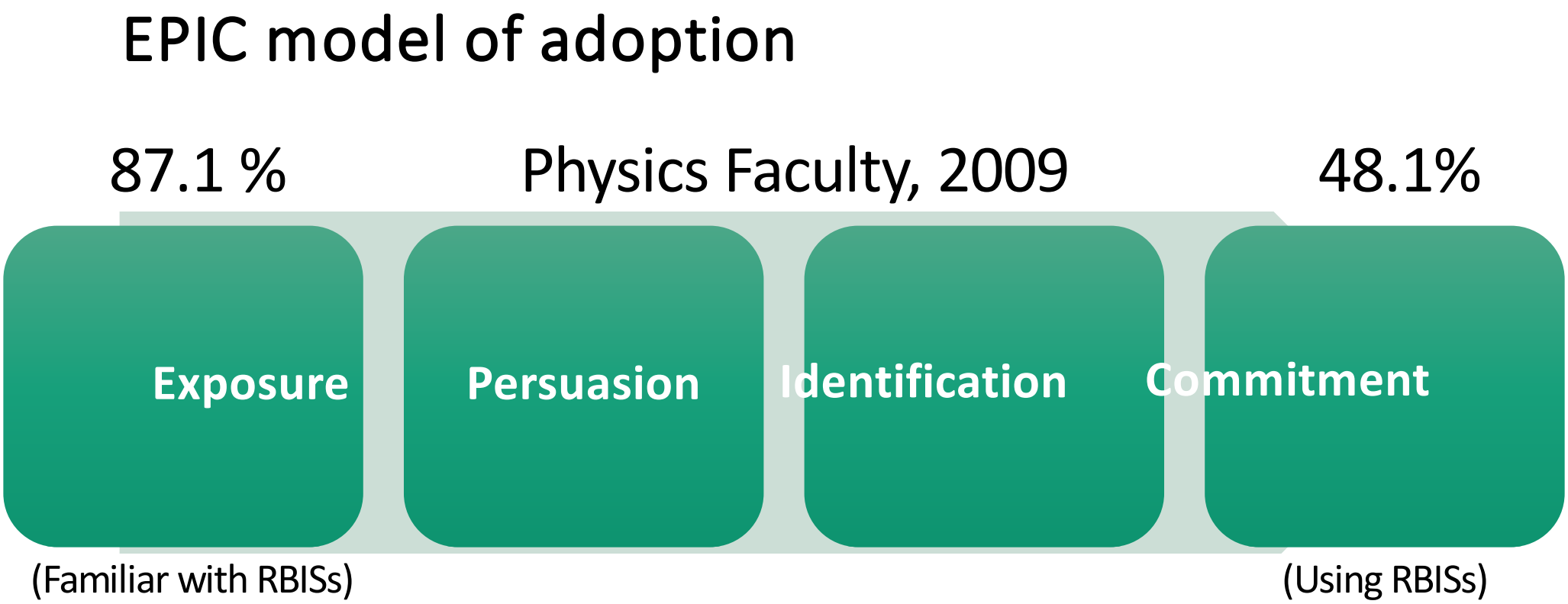
Hurtado et al. 2011

EPIC model of adoption



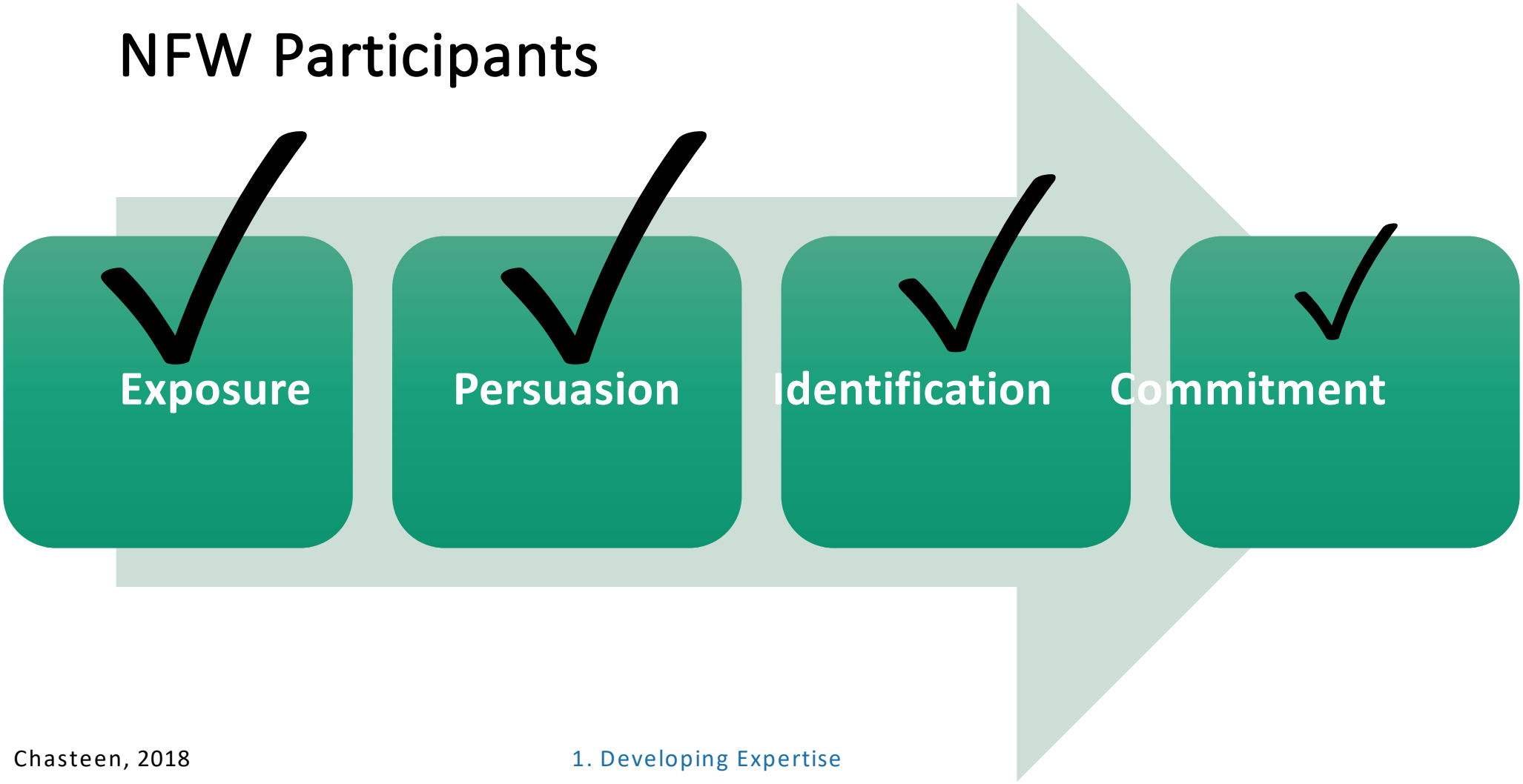
Aragón et al 2016; Cavanagh et al. 2016

EPIC model of adoption

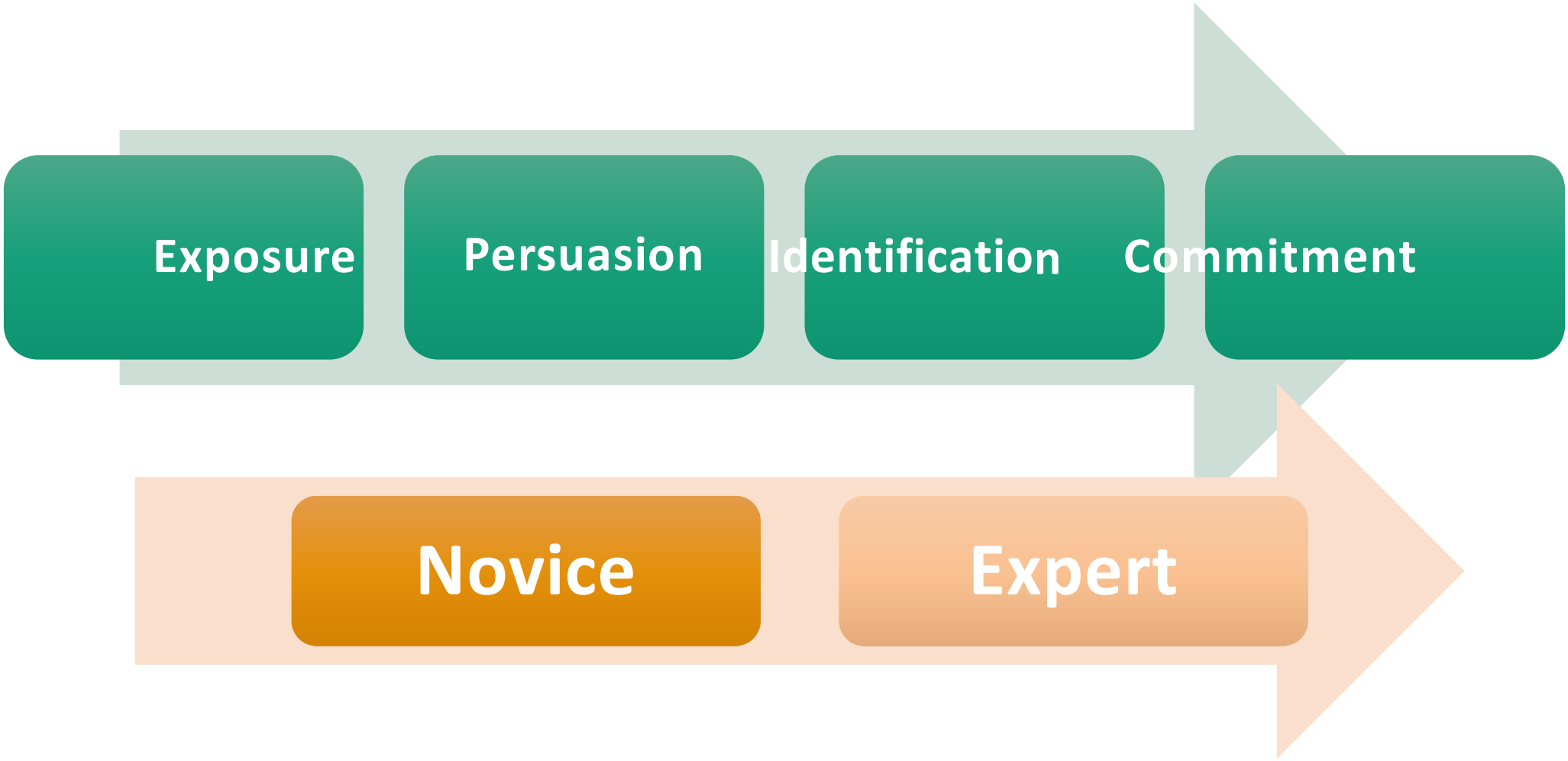


Henderson & Dancy, 2009

NFW Participants



Chasteen, 2018


Exposure
Persuasion
Identification
Commitment
Novice
Expert

On the way to expertise, you might…

- Struggle to organize new information effectively.
- Have fewer automated processes.
- Work harder & feel less efficient than usual.
- Notice yourself “doing school” vs “sense-making”

Part 1 Takeaways:

- Be aware of EPIC:
  Exposure, Persuasion, Identification, Commitment
- Rely on supports to help you develop expertise and build robust knowledge structures.
  E.g., scripts, templates, etc.
- Notice when you are “doing school” vs “sense-making” – invest in sustainable adoption with the latter

1. Developing expertise
2. **Wise instructional choices**
3. Context matters

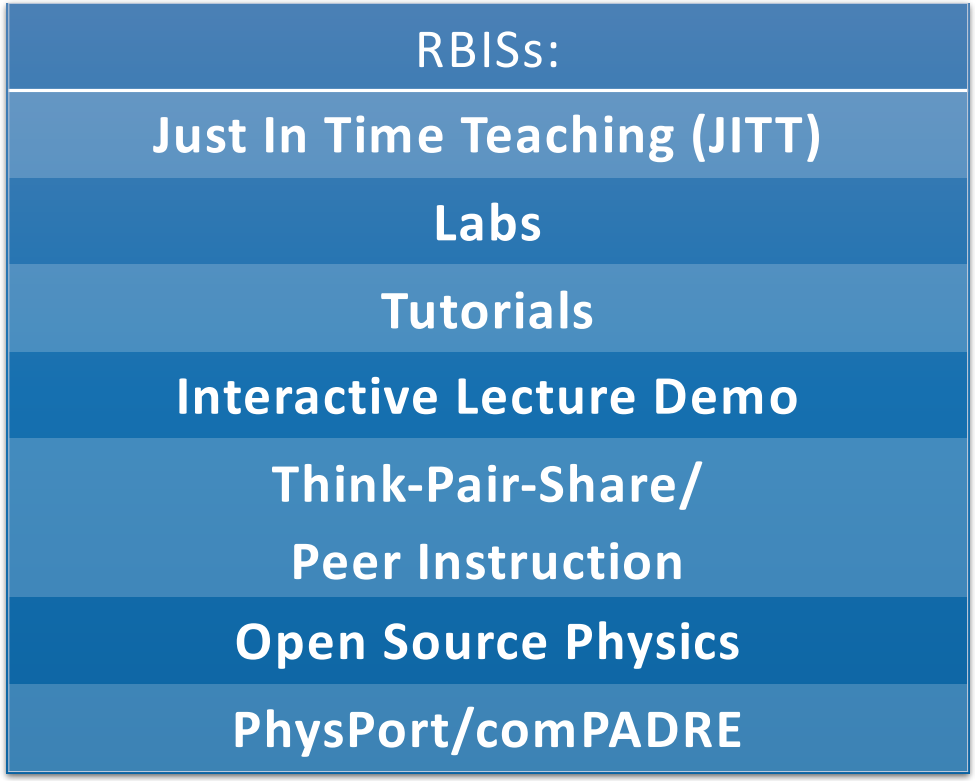
On the way to expertise, you might…

- Struggle to organize new information effectively.
- Have fewer automated processes.
- Work harder & feel less efficient than usual.
- Notice yourself “doing school” vs “sense-making”

NRC 2015

Olmsted and Turpen, 2017

Having a framework will help:



You will encounter:

- Evidence of effectiveness
- Use:
  - Sample(s)
  - Demo(s)
  - Case(s)
- Implementation advice
- Discussion/application

Crucial questions to ask about RBISs

- **Why use this?**
- **What aspects are essential?**
- **What are the potential pitfalls?**

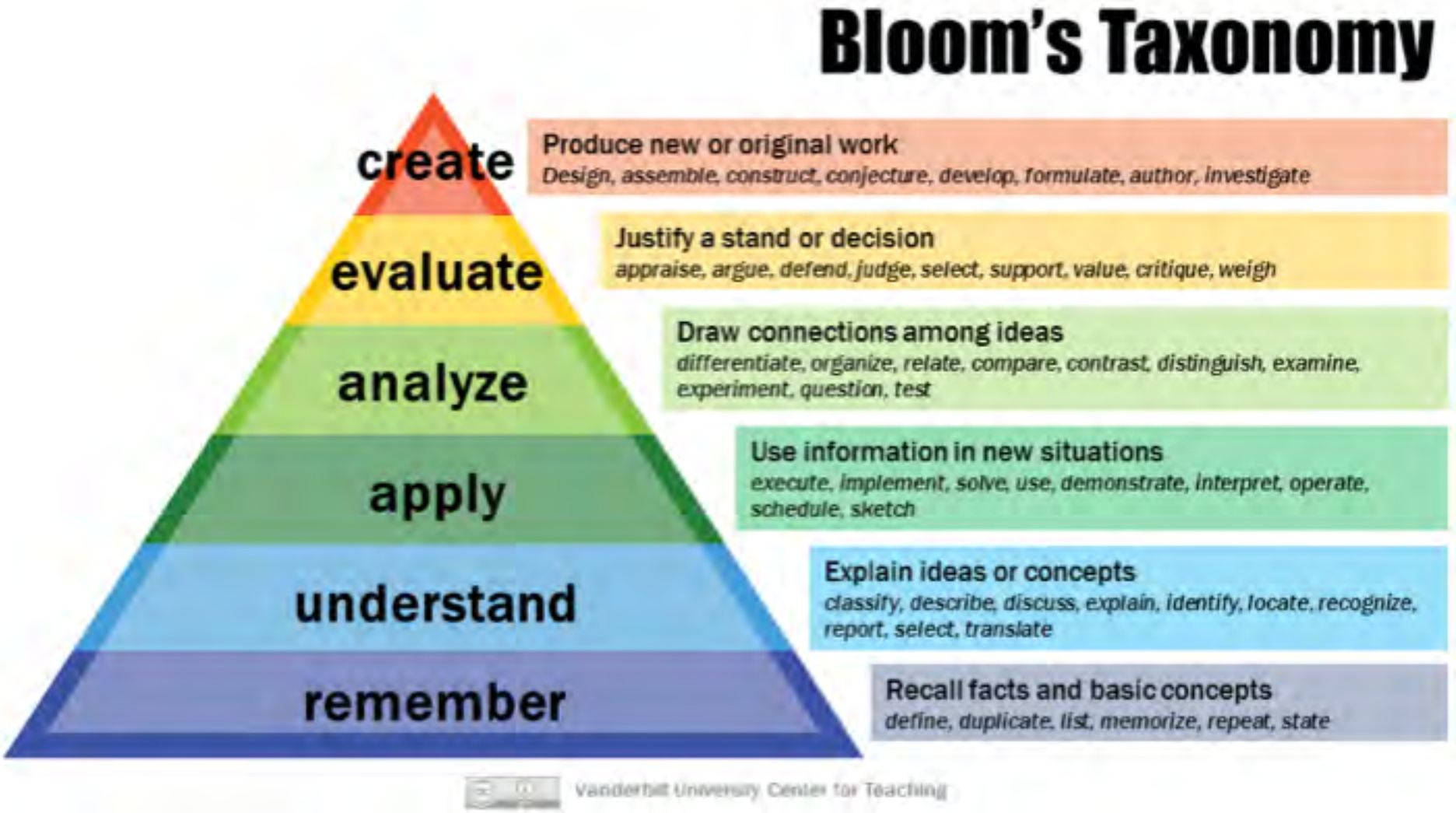
Why use this?

Hypothetical RBIS A

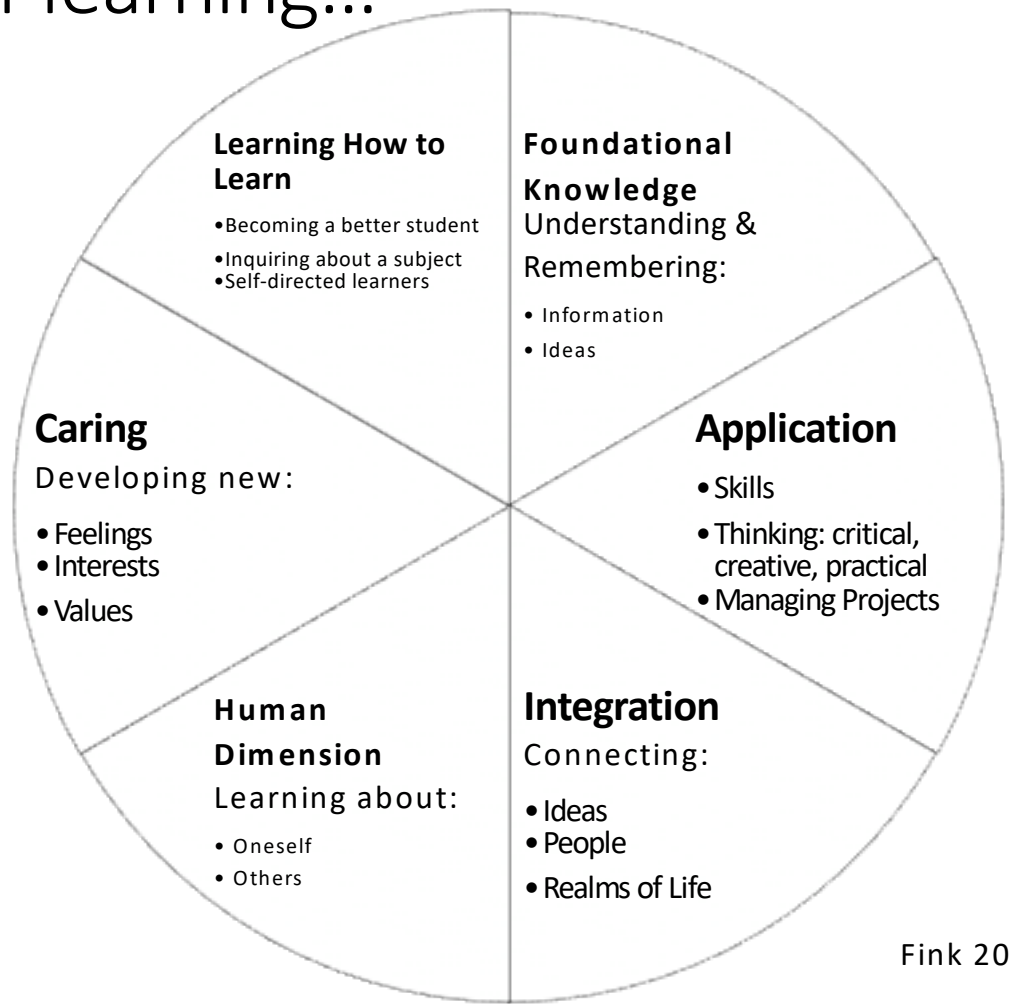
- Students work in pairs
- Short conceptual questions
- One cycle takes a few minutes

Hypothetical RBIS B

- Students work in teams of four
- Multi-part problems/cases
- One cycle takes 20-30 minutes


Bloom's Taxonomy
create
Produce new or original work
Design, assemble, construct, conjecture, develop, formulate, author, investigate
evaluate
Justify a stand or decision
appraise, argue, defend, judge, select, support, value, critique, weigh
analyze
Draw connections among ideas
differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test
apply
Use information in new situations
execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch
understand
Explain ideas or concepts
classify, describe, discuss, explain, identify, locate, recognize, report, select, translate
remember
Recall facts and basic concepts
define, duplicate, list, memorize, repeat, state
Vanderbilt University Center for Teaching

Other kinds of learning…



Fink 2003

Affordances

- **What a technology/approach/environment offers**
- What it makes possible
- May include:
  - Usefulness
  - Usability
  - Educational functionality
  - Social functionality
- Could be desirable or not

Kirschner et al. 2004

Affordances: E.g., CHALK

- **What a technology/approach/environment offers**
- What it makes possible
- May include:
  - Usefulness
  - Usability
  - Educational functionality
  - Social functionality
- Could be desirable or not

Stable place to record ideas

Students see multiple panes/ phases of thinking; editable

Standing, Writing, Seeing

Often used by only the instructor; may be used collaboratively

Why use this?

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Hypothetical RBIS B

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What kinds of learning can it address?
What are its key affordances?

Crucial questions to ask about RBISs

- **Why use this?**
  What kinds of learning can it address?
  What are its key affordances?
- **What aspects are essential?**

Fidelity of adoption

High Quality Reproduction

What's essential? What's adaptable?

Li et al. 2015

Minimum increment

What aspects are essential?

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- Students work in pairs
- Short conceptual questions
- One cycle takes a few minutes

Hypothetical RBIS B

- Students work in teams of four
- Multi-part problems/cases
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Fidelity of adoption?
Minimum increment?

What are the potential pitfalls?

- Common “mistakes” (non-optimal implementations)?
- Ways to avoid them?

Potential pitfalls

FEEDBACK

“ [Student] comments on the use of polls is generally mixed, but encouraging.

One of the general takeaways, that you had already warned me about, is that such things can be useful, but one has to be very careful how one uses it.

I enjoyed the [method] and aim to use it more in the future, but it requires a lot of thought to make it productive. And even more to have the students recognize the value :-) ”

What are the potential pitfalls?

- Common “mistakes” (non-optimal implementations)?
- Ways to avoid them?

NFW practice sessions – you will get several main pitfalls out of the way here.

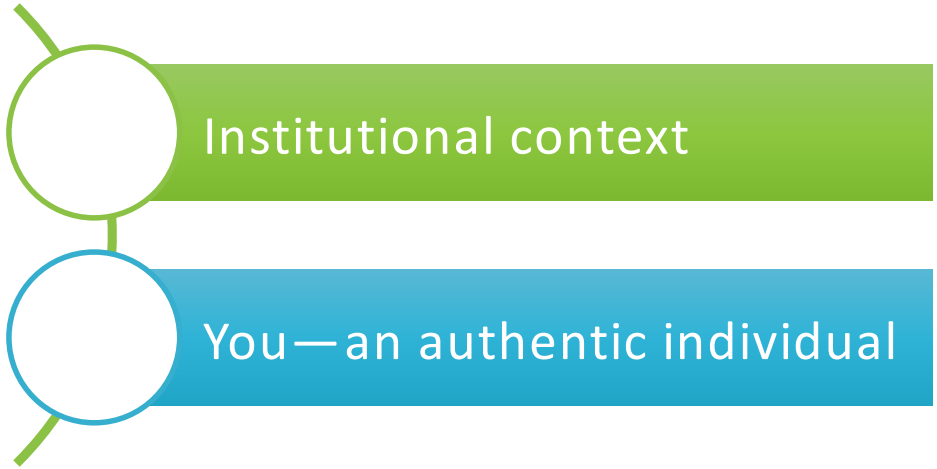
Ask:
- **NFW Facilitators**
- **Each other**

These may not always be articulated in the published literature…

1. Developing expertise
2. Wise instructional choices
3. **Context matters**

Common hurdles in adopting/sustaining RBISs:

- **Training**
- **Time**
- **Incentives**
- **Tensions with professional identity**



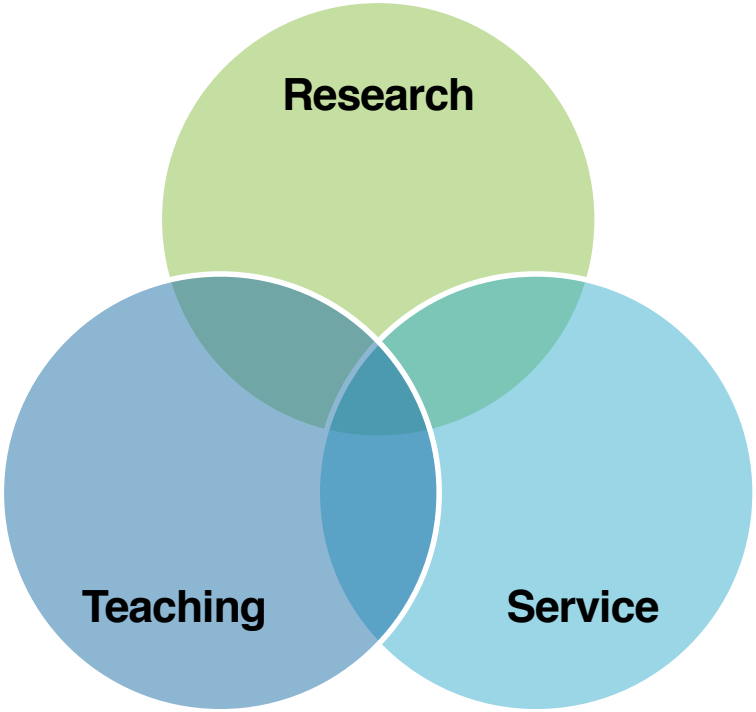
Brownwell & Tanner 2012

Institutional context

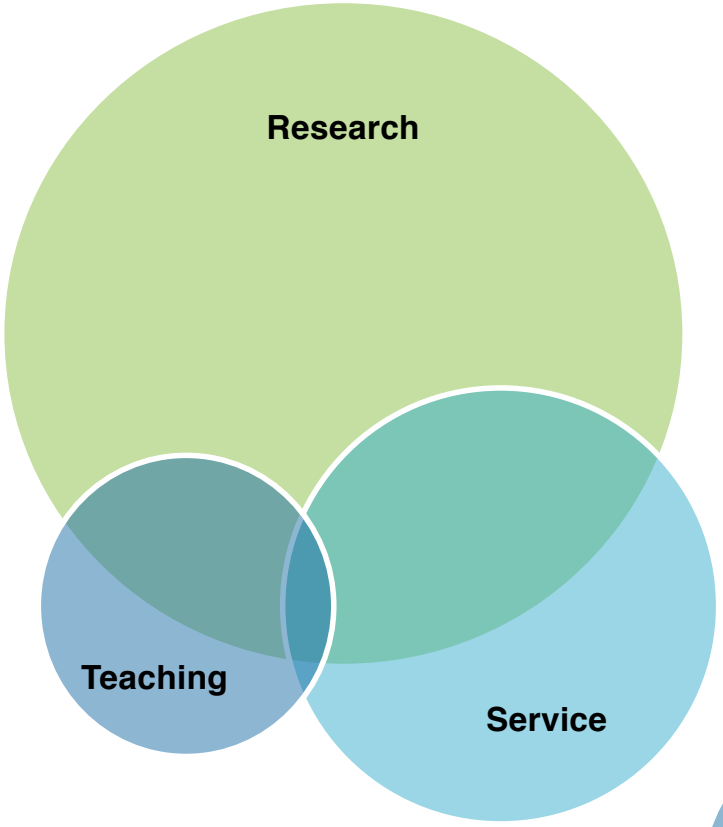
Time

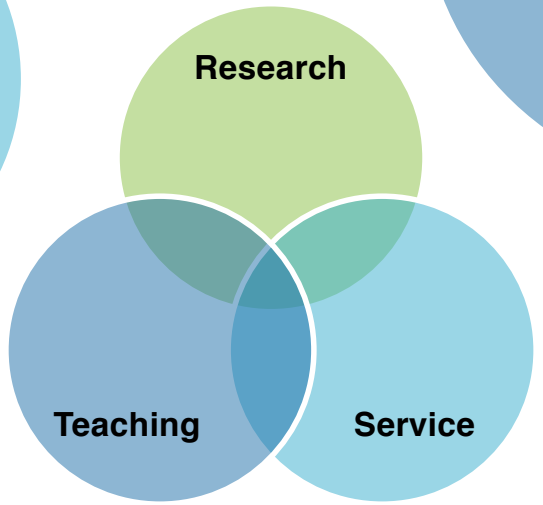
Incentives

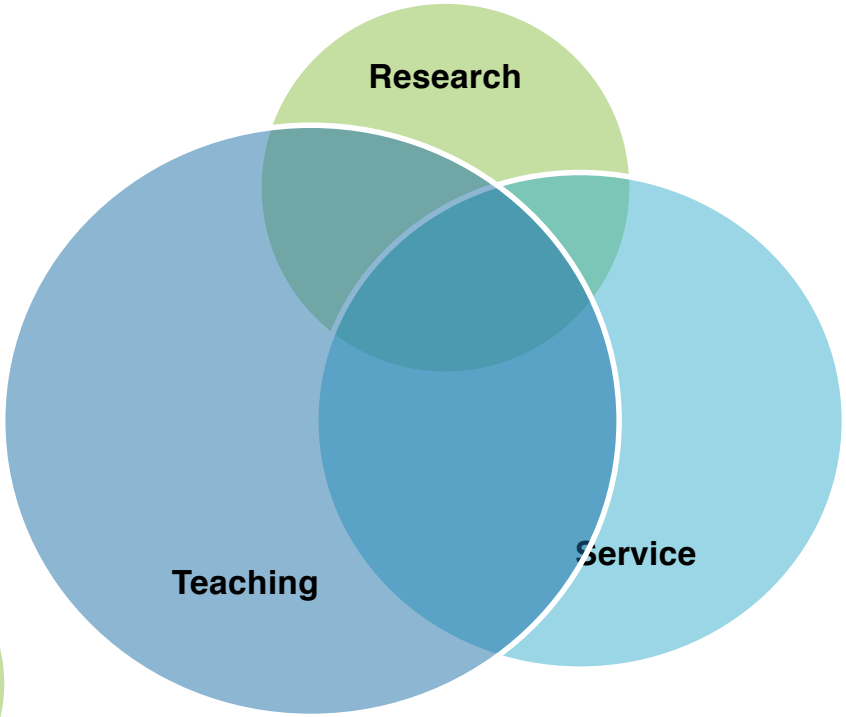
Identity



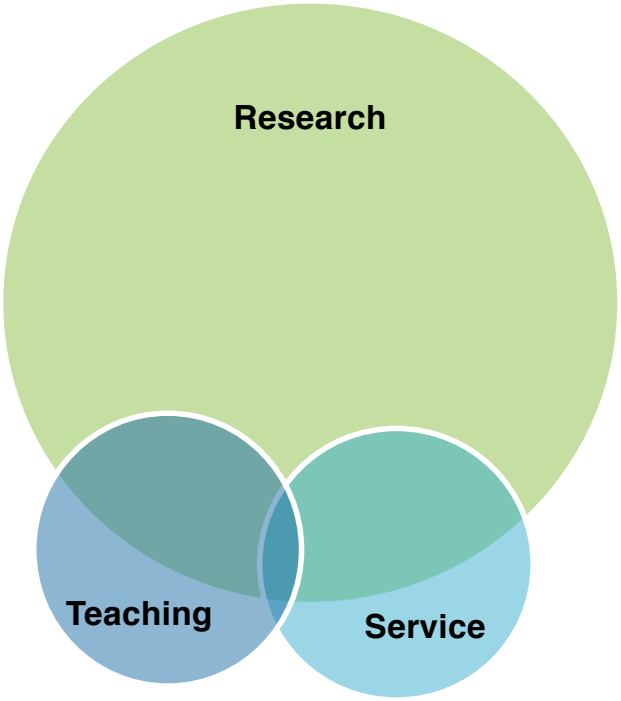
Context: Institutional Differences

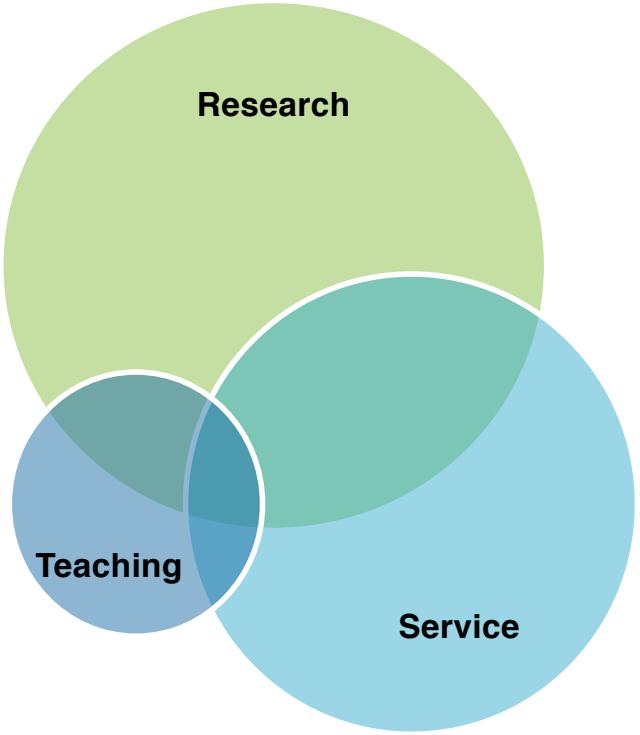


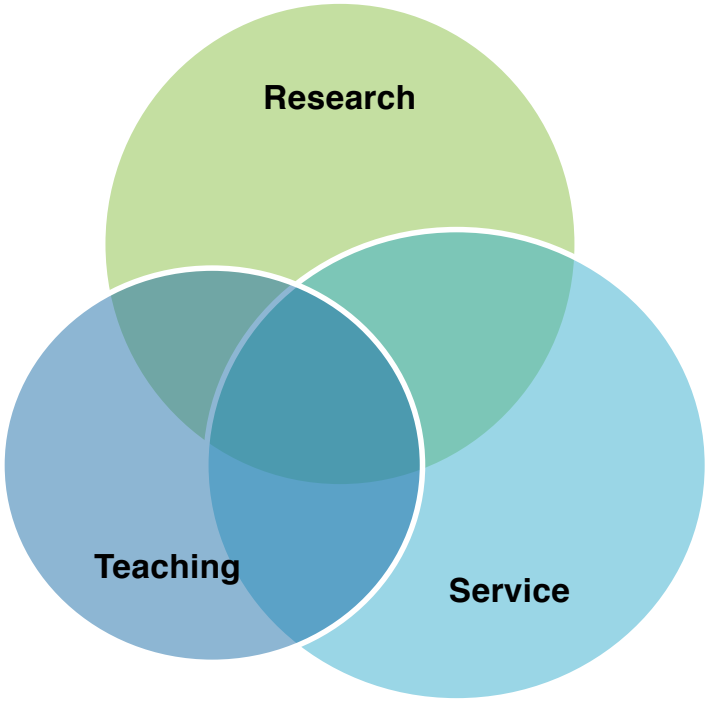




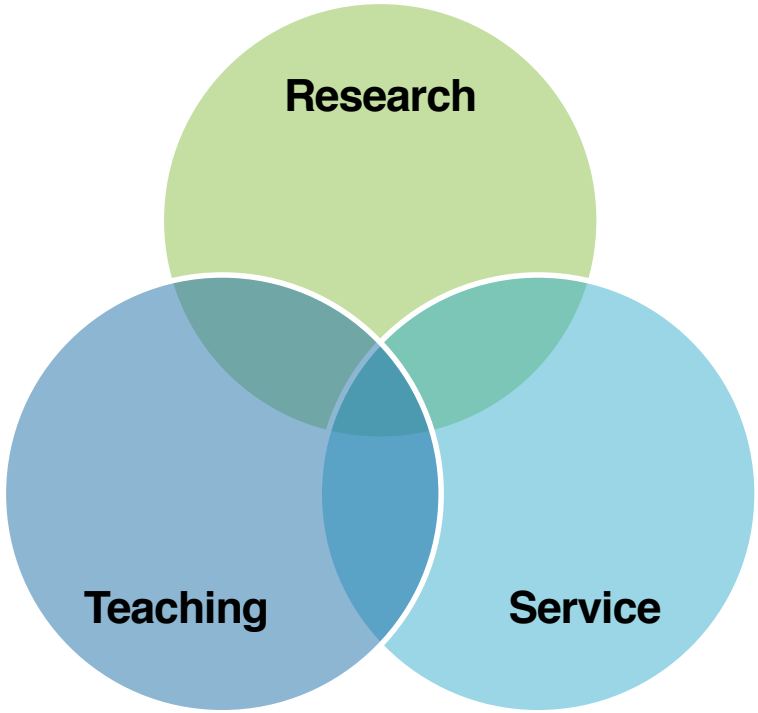
Context:
Career Stage Differences

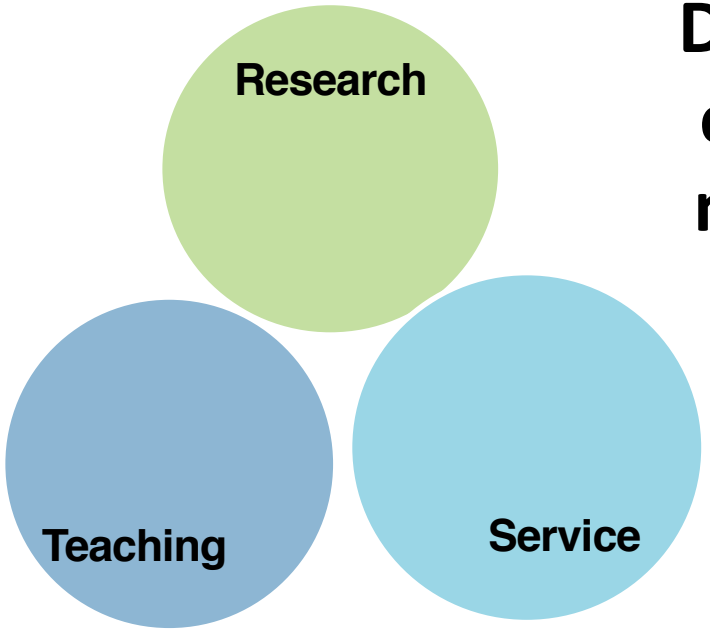




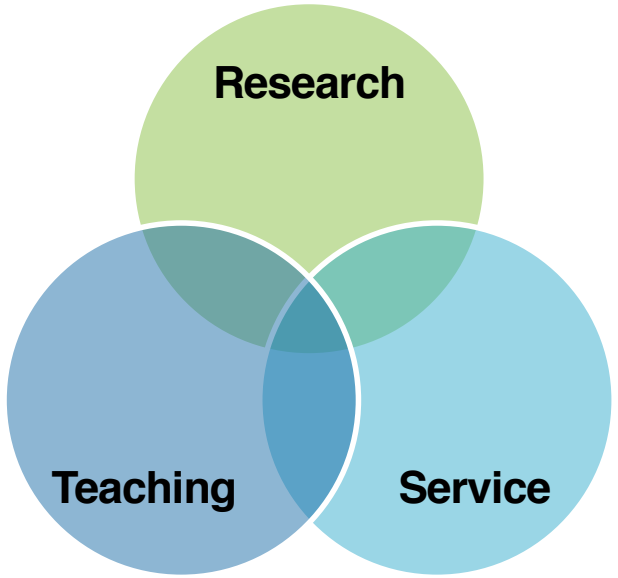


Evaluation Criteria (Promotion/Tenure)



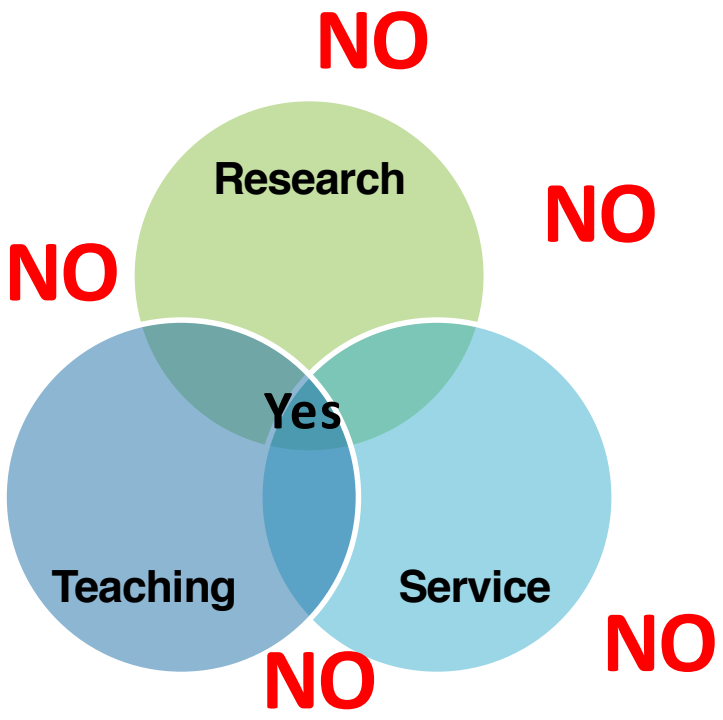


Does the overlap matter?

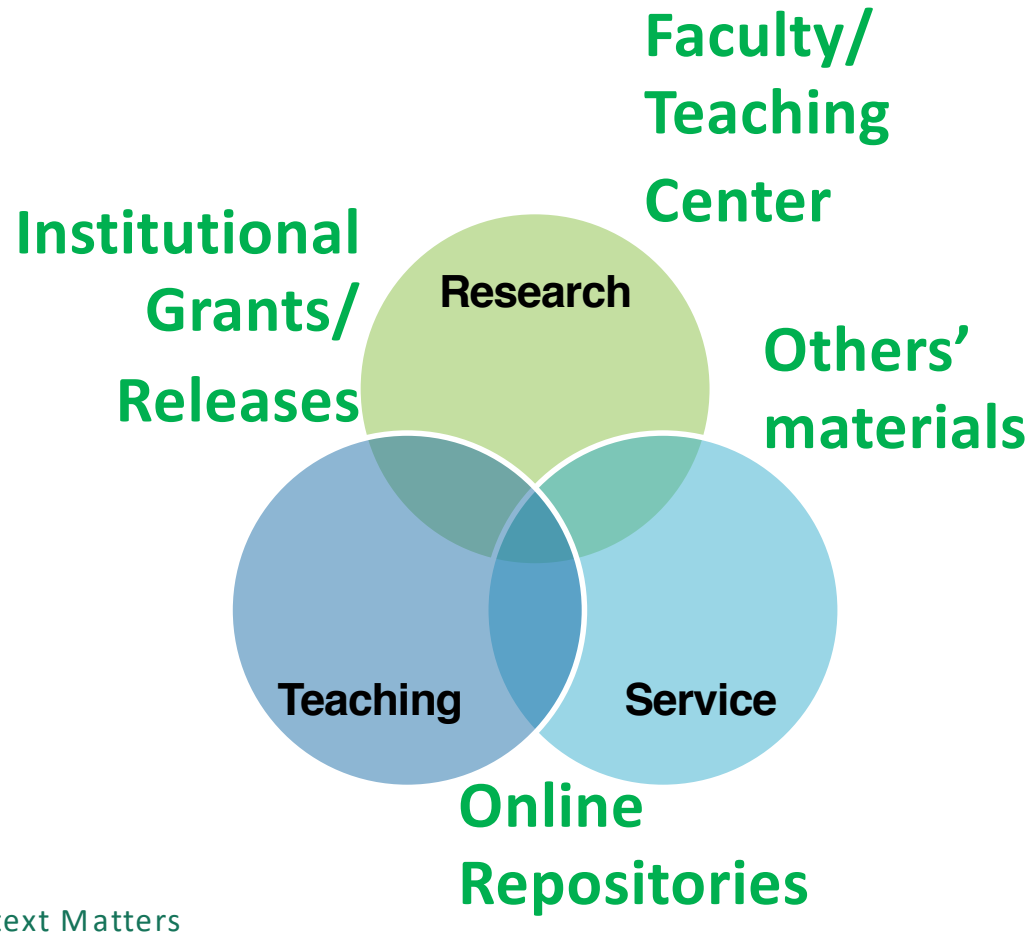


Bubbles exclude things, too:

SAYING NO



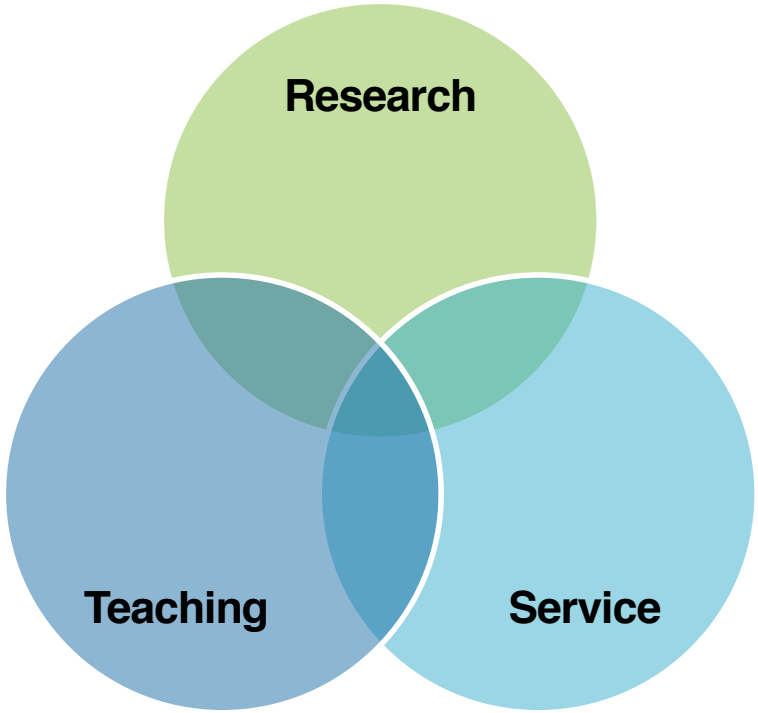
USING RESOURCES



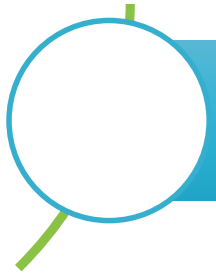
Institutional context

Time

Incentives



Productive Alignment



You—an authentic individual

Professional & Personal Identity Matters

- Who you are as a scientist, educator, mentor, colleague, person…
- Circumstances in which you best express your enthusiasm and passion…

Context and Identity

Hypothetical RBIS A

- Students work in pairs
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- One cycle takes a few minutes

Hypothetical RBIS B

- Students work in teams of four
- Multi-part problems/cases
- One cycle takes 20-30 minutes

What if you:

- Have multiple course preps in a term?
- Teach in rooms with fixed, tiered seating?
- Find it challenging to interrupt/improvise?
- Have a full set of course materials from a colleague and are teaching for the first time?

Physics and Astronomy New Faculty Workshop: June 2018

The following questions may be helpful when deciding which RBISs (Research Based Instructional Strategies) to implement

Why use this RBIS? • For what kinds of learning goals and objectives is it well suited? • What are its key affordances?	
What are the essential aspects? • What do you need to do to maintain fidelity? • What's the minimum increment?	
What are the potential pitfalls? • Common "mistakes" (non-optimal implementations)? • Ways to avoid them?	
How does this RBIS align with your context? • Time and Effort • Support and Resources • Expectations in Your Role	
How does it align with your teaching personality, values, and goals? • How does it seem like a good fit? • What might be challenging? • Are the challenges worth it now?	

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