Disciplinary TA Development: Partnerships between Centers and Departments

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Georgia Institute of Technology

Workshop presented at the annual conference of The POD Network

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Georgia Tech Center for Teaching and Learning

Georgia Tech Physics College of Sciences

Workshop Goals

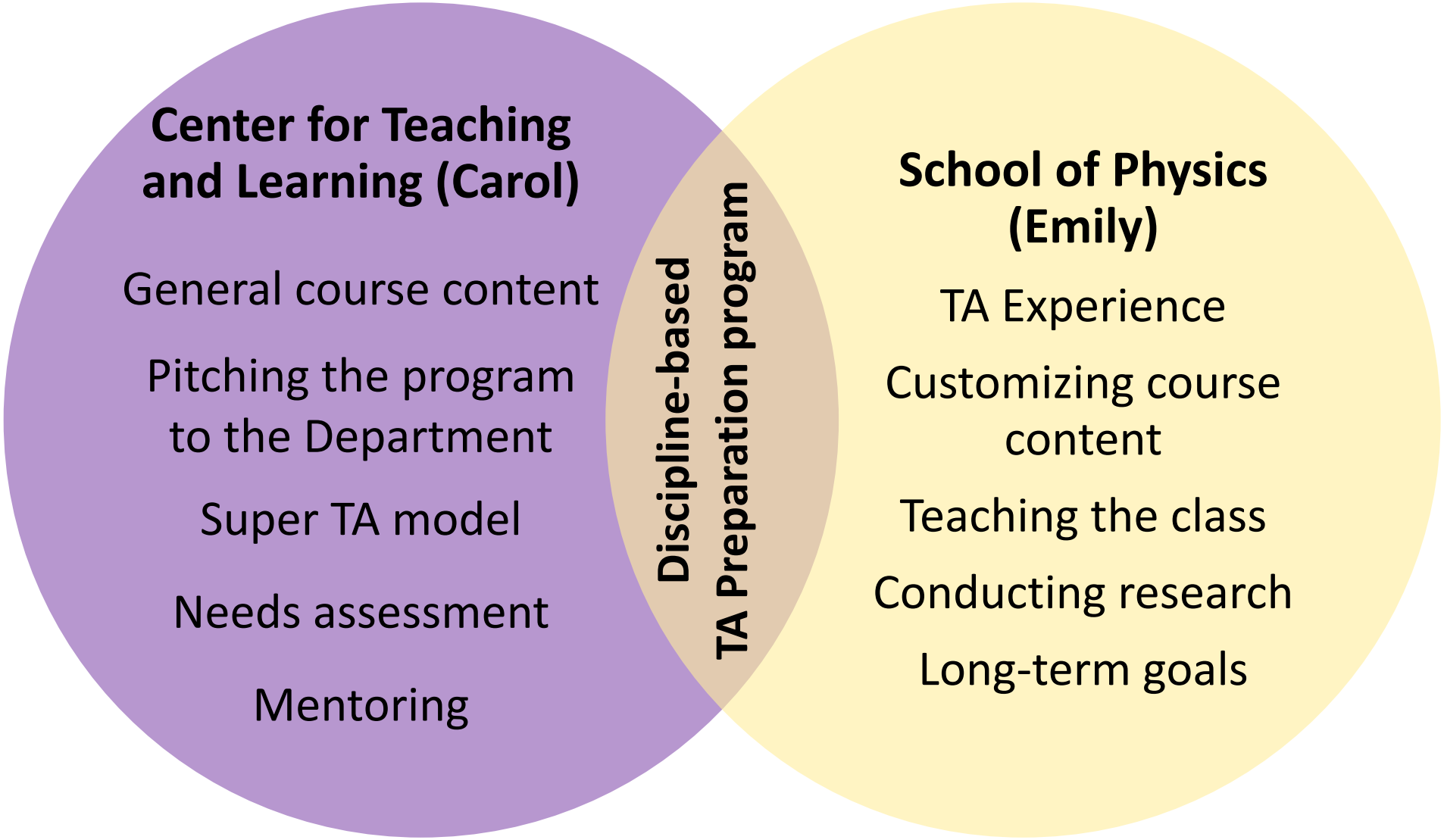
- Consider the challenges and opportunities of **adapting discipline-based TA Development** to participant's home contexts in order to anticipate factors important for establishing a partnership between the Center for Teaching and Learning and the Academic Unit.
- **Create TA development experiences** that target discipline-specific pedagogical challenges.
- Identify potential **organizational challenges** at participants' home institutions and reflect on how our partnership model might be modified to address the challenges they anticipate encountering.

Welcome and Introductions

Carol
Center for Teaching and Learning,
Educational Development, Anthropology

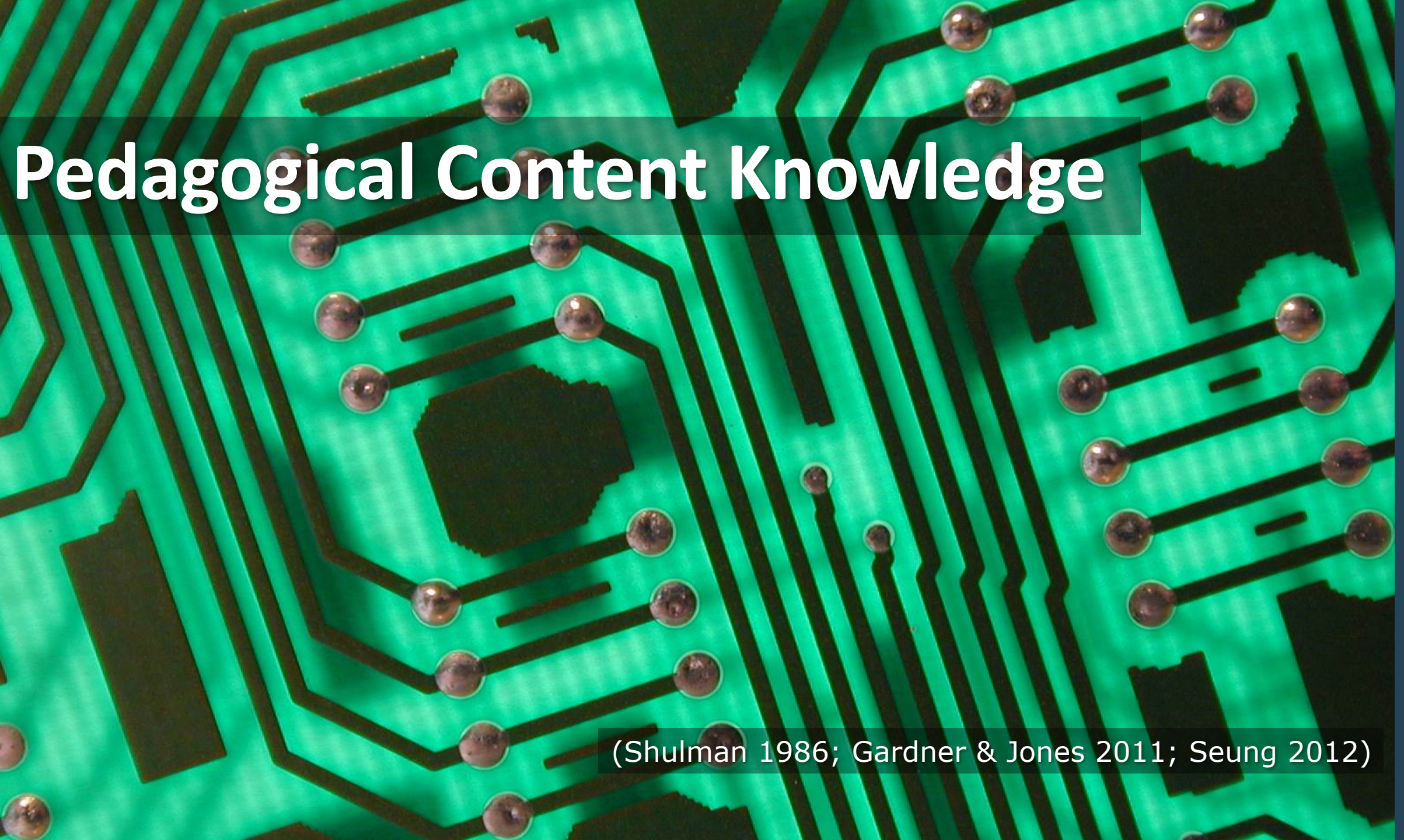
Emily
Physics Ph.D. Candidate, Astronomy,
TA, Physics Education Research

Partnership



What are your interests in disciplinary TA development?

Why do discipline-based TA Development?



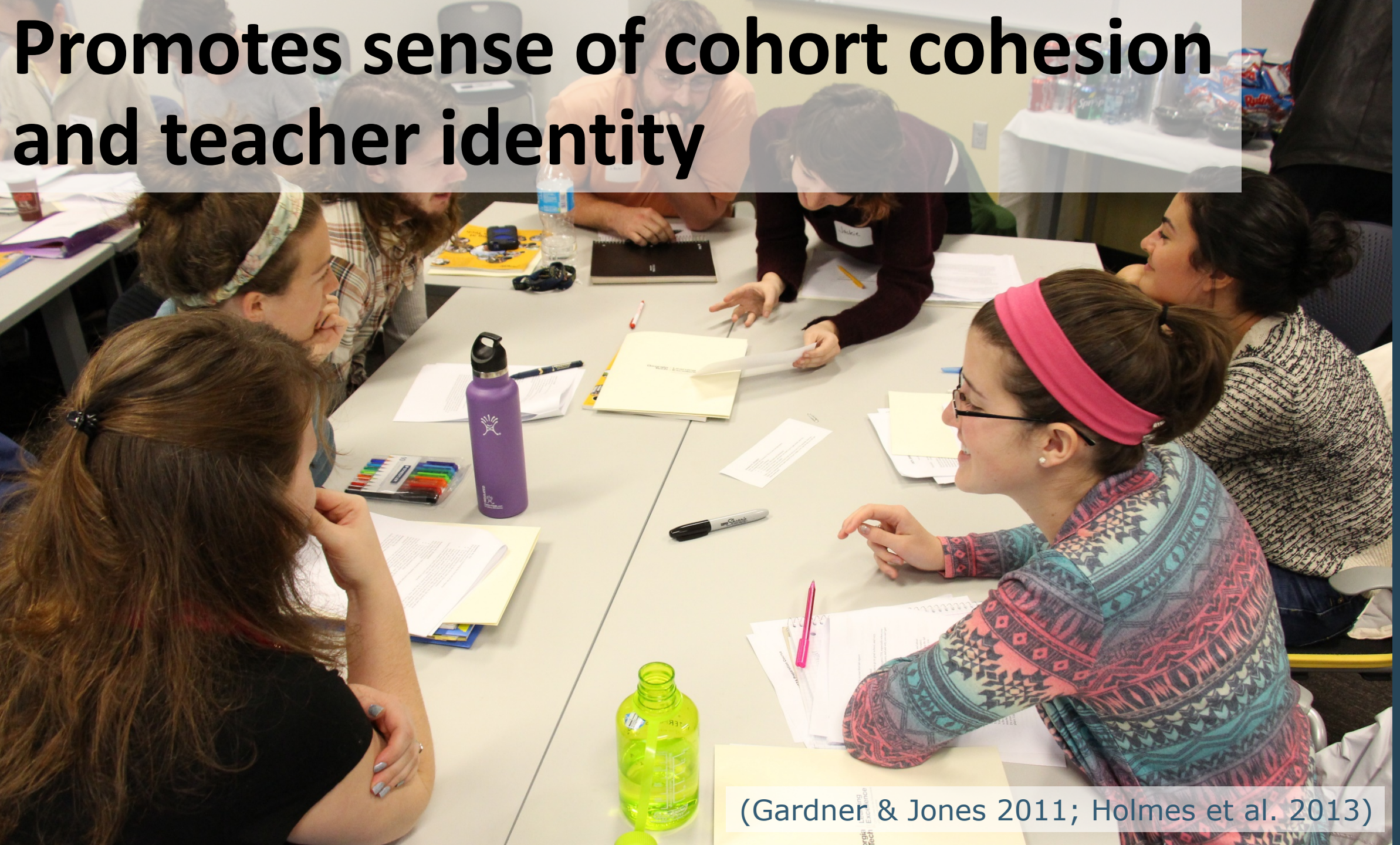
Pedagogical Content Knowledge

(Shulman 1986; Gardner & Jones 2011; Seung 2012)

Teaching is valued by department

(Armenti & Wheeler 1978; Heller 2014)

Promotes sense of cohort cohesion and teacher identity



(Gardner & Jones 2011; Holmes et al. 2013)

What are some challenges of discipline-based TA Development?

Incomplete expertise

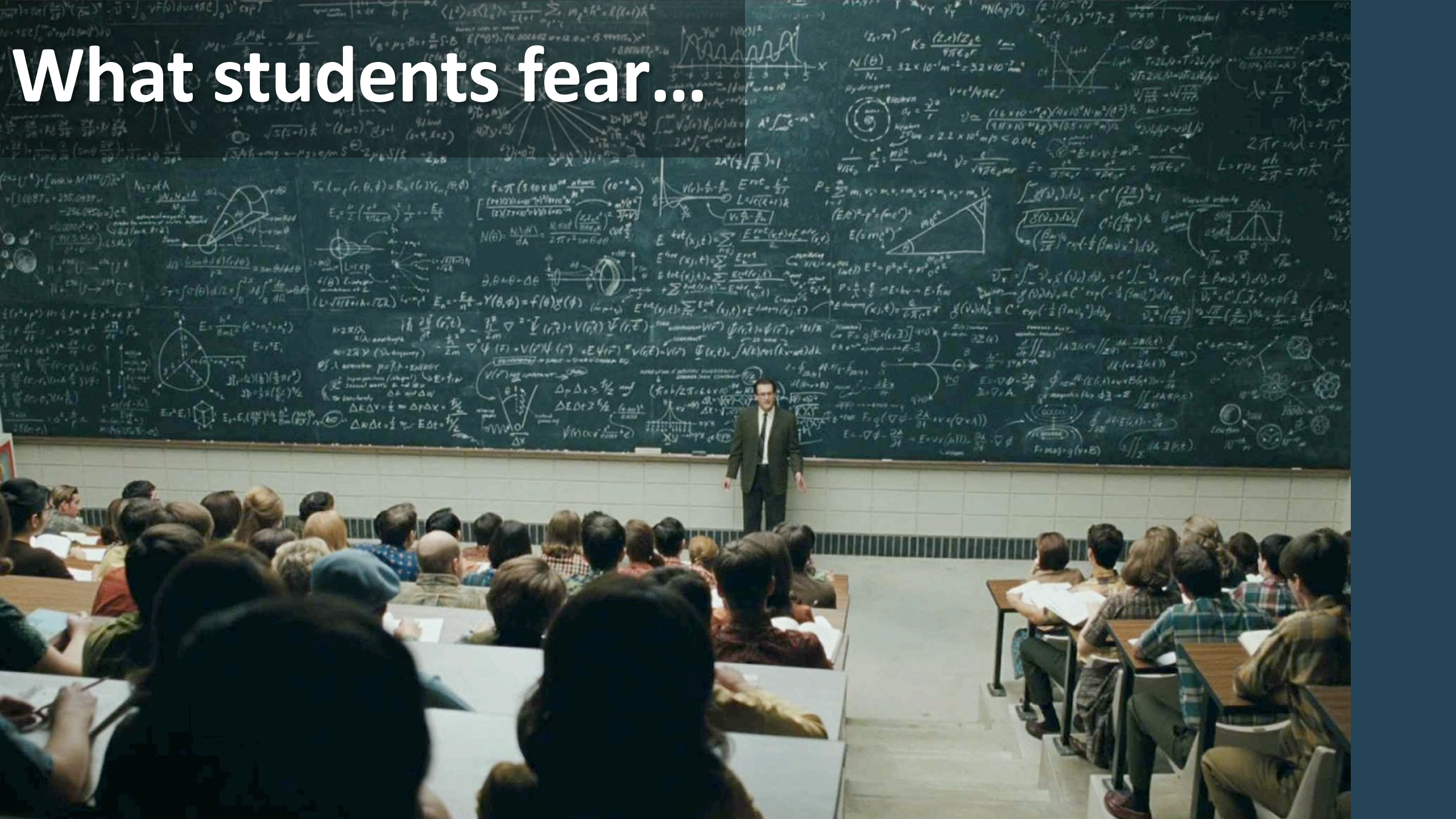
Insufficient structural support

(Luft et al. 2004)

What issues do you anticipate will be the most pressing for your context?

Teaching Physics

What students fear…



Reality is not much different…

…but things <u>are</u> better

What students experience with TAs

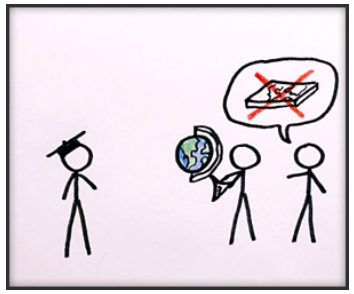
Design learning experiences for TAs to address physics-specific challenges

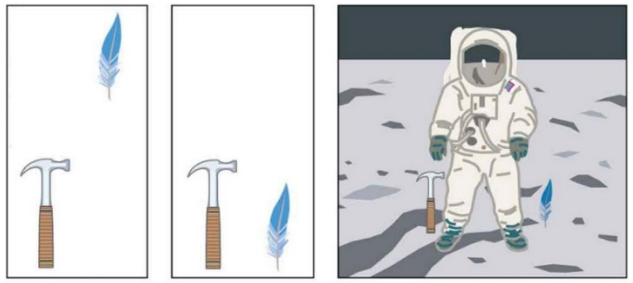
Module: "Teaching Physics"

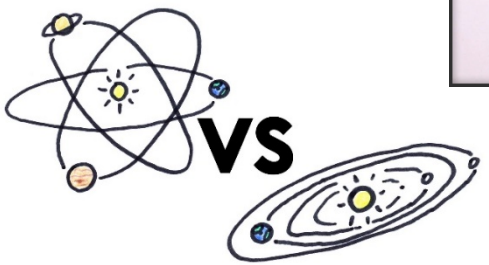
- Best way to teach physics, best way to learn physics?
- Expert/novice differences
- Active learning in physics
- Problem solving
- Unpacking student questions
- Prior knowledge and building good explanations
- Preconceptions, misconceptions

Physics Misconceptions

- Incorrect mental models that are strongly held and difficult to counter
- Important for physics teachers to correct students' misconceptions
- Directly confronting the misconception is better for student learning than simply stating the correct facts



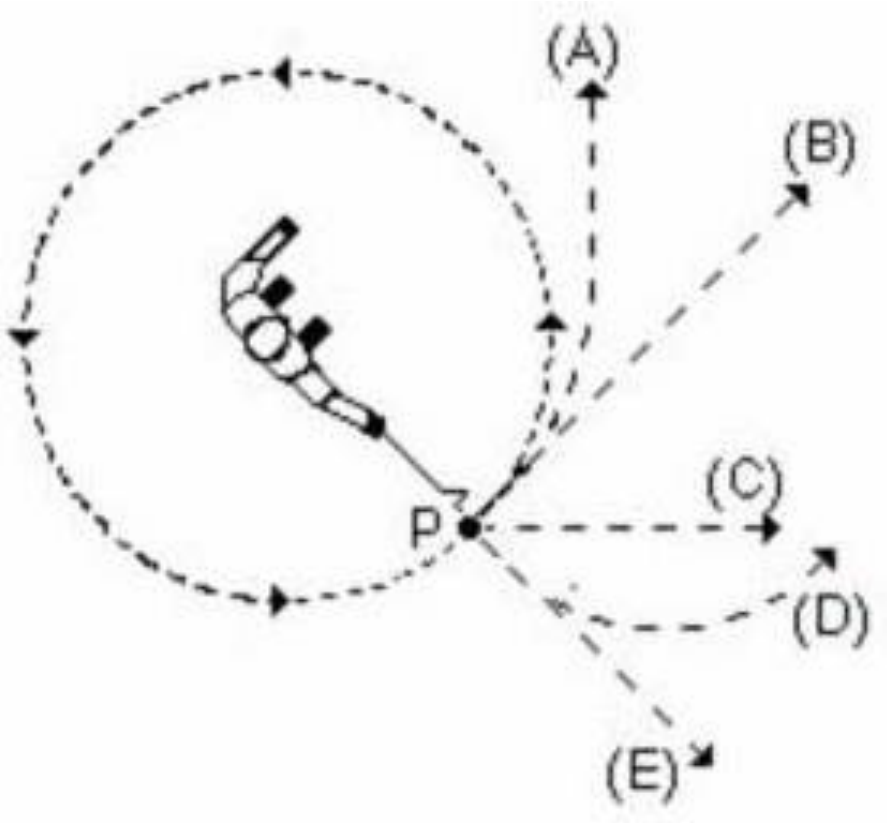




(Knight 2003; Muller 2008)

Misconceptions Activity

A steel ball is attached to a string and is swung in a circular path in a horizontal plane as illustrated in the accompanying figure. At the point P indicated in the figure, the string suddenly breaks near the ball. If these events are observed from directly above as in the figure, which path would the ball most closely follow after the string breaks?



Question from the Force Concept Inventory (FCI)

(Hestenes et al. 1992)

Misconceptions Activity

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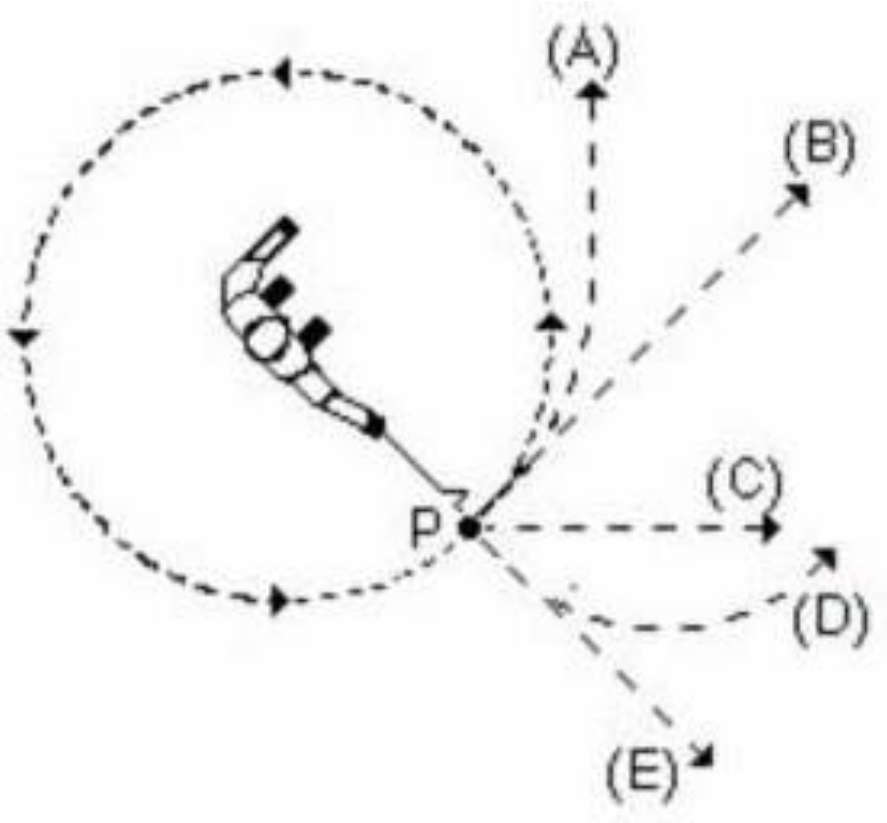
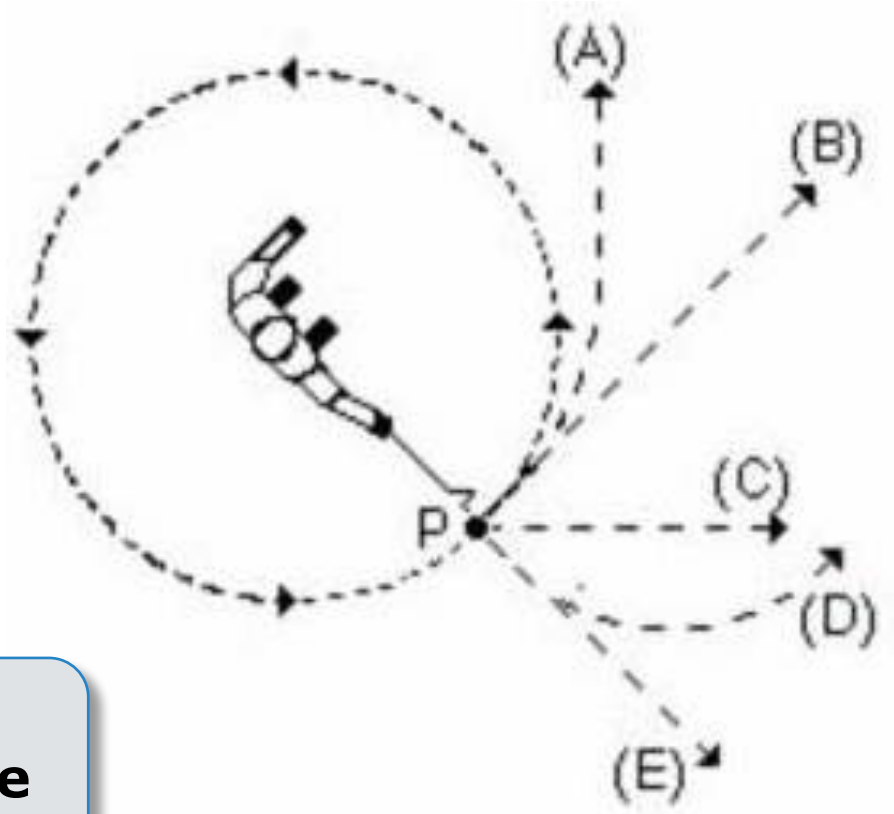


Question from the Force Concept Inventory (FCI)

(Hestenes et al. 1992)

Misconceptions Activity

- Correct answer is **B**
- Why would a student pick any of the incorrect answers?
- How would you address these misconceptions and correct them?

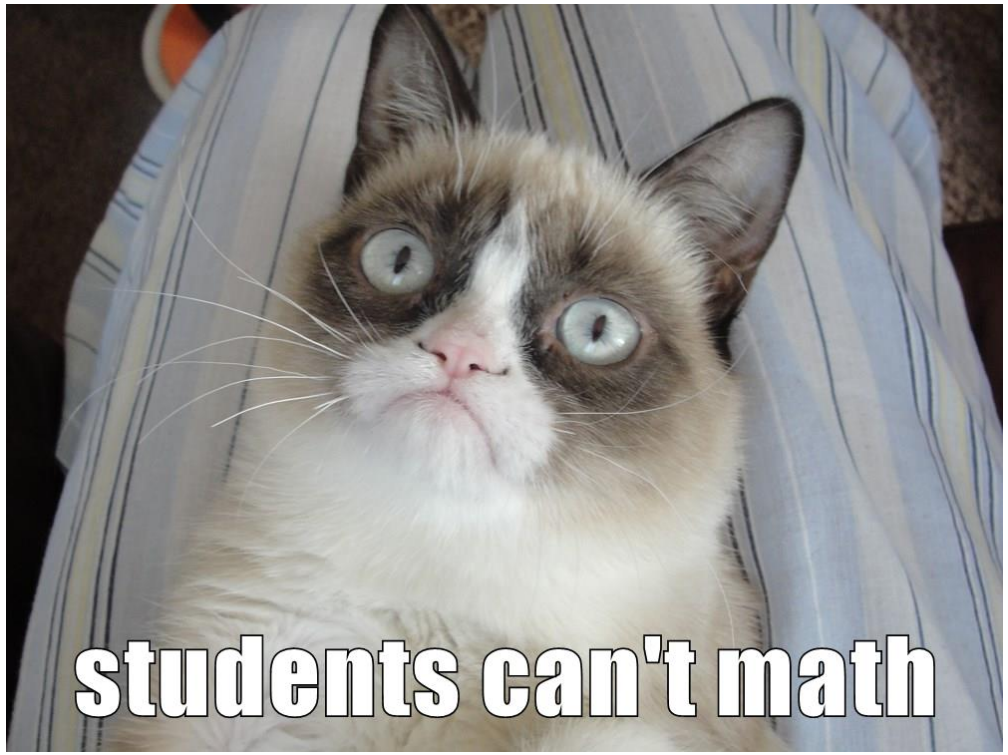


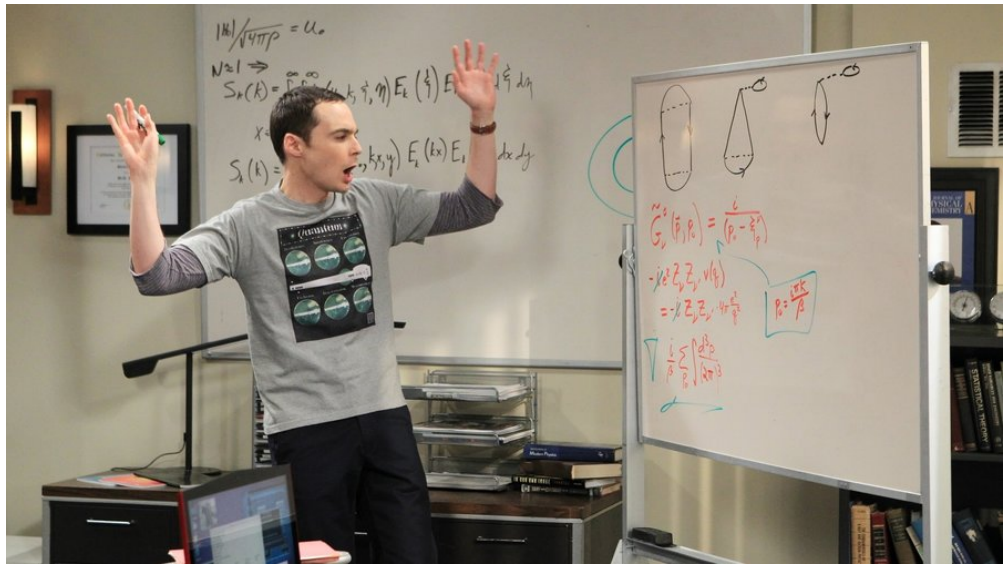
Activity allows TAs to get into the students' heads and gives them a chance to think of ways to meet this challenge

Challenges in preparing new Physics TAs

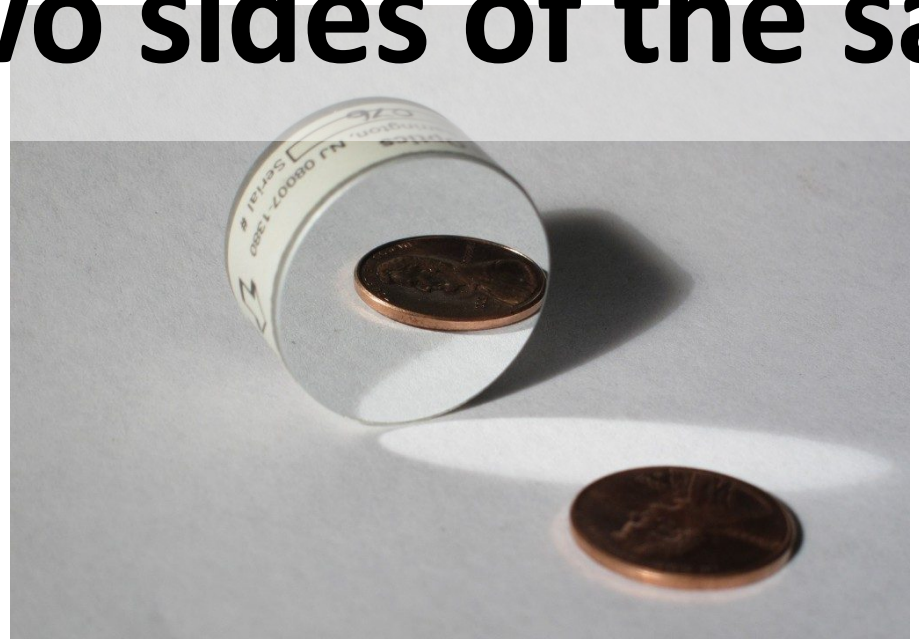
- Cultural inertia
- Negative attitudes
- The need to know everything

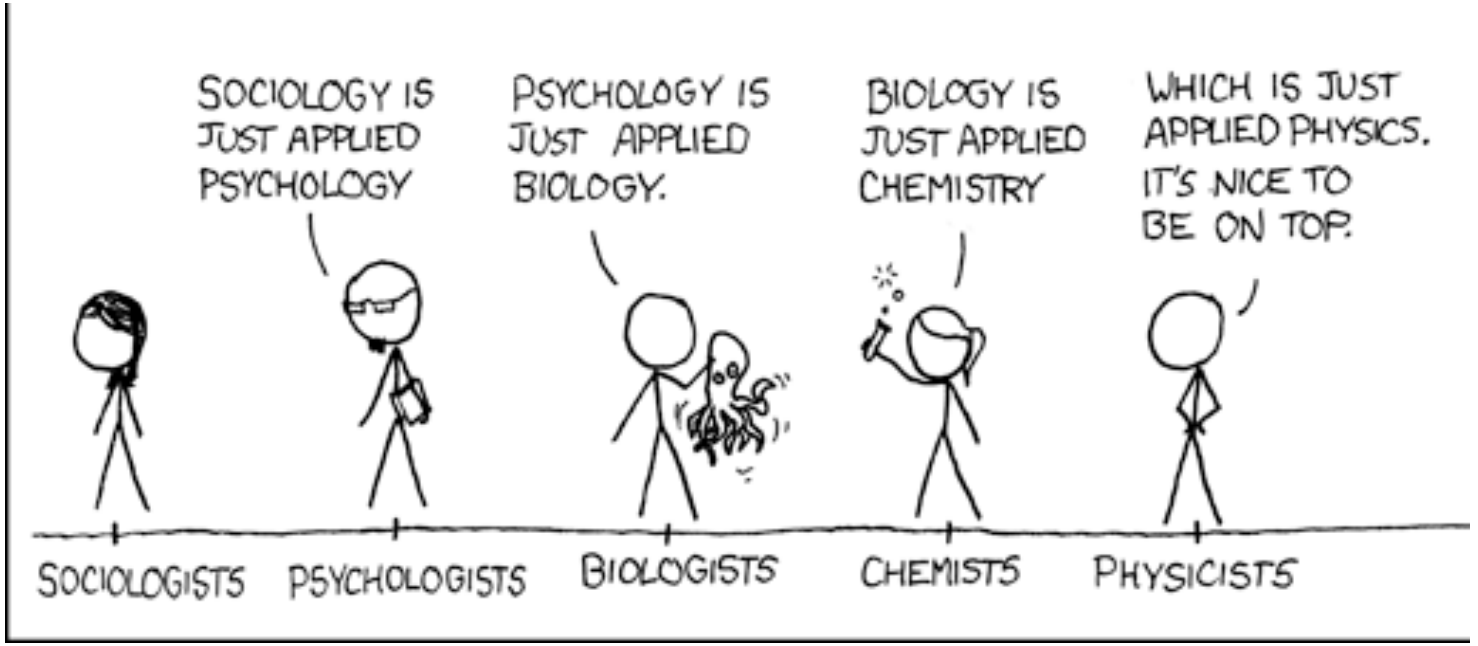
See handout: Case Studies

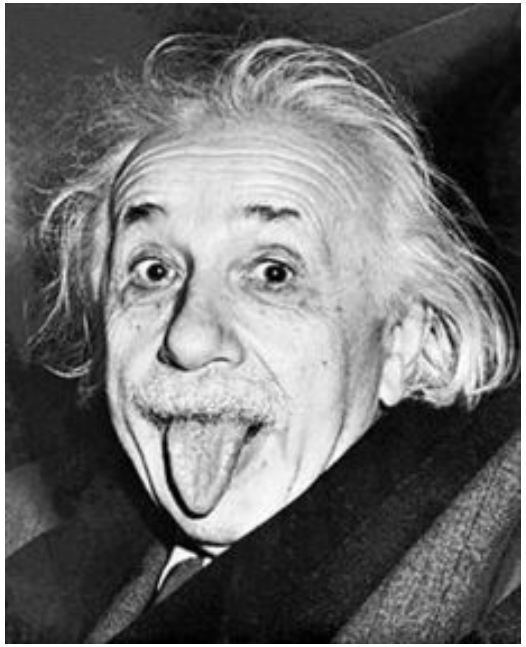




Two sides of the same coin…







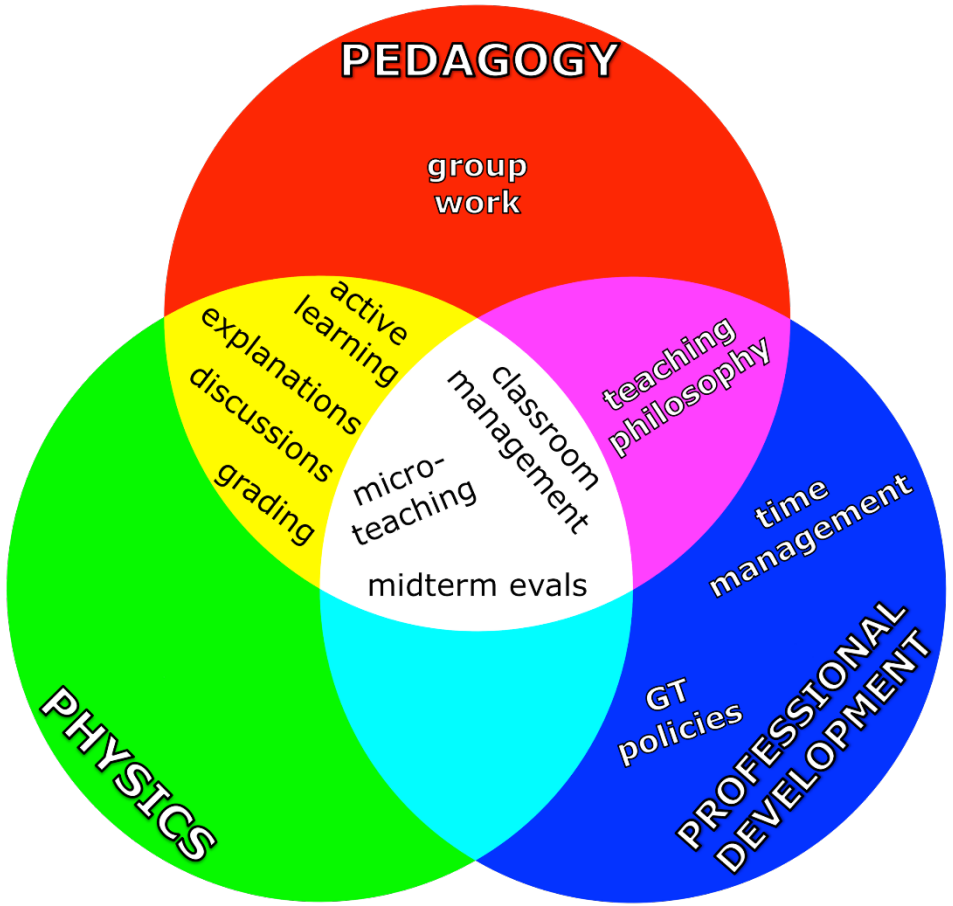
Our Model: CETL 8000

Discipline-Based TA Development Model

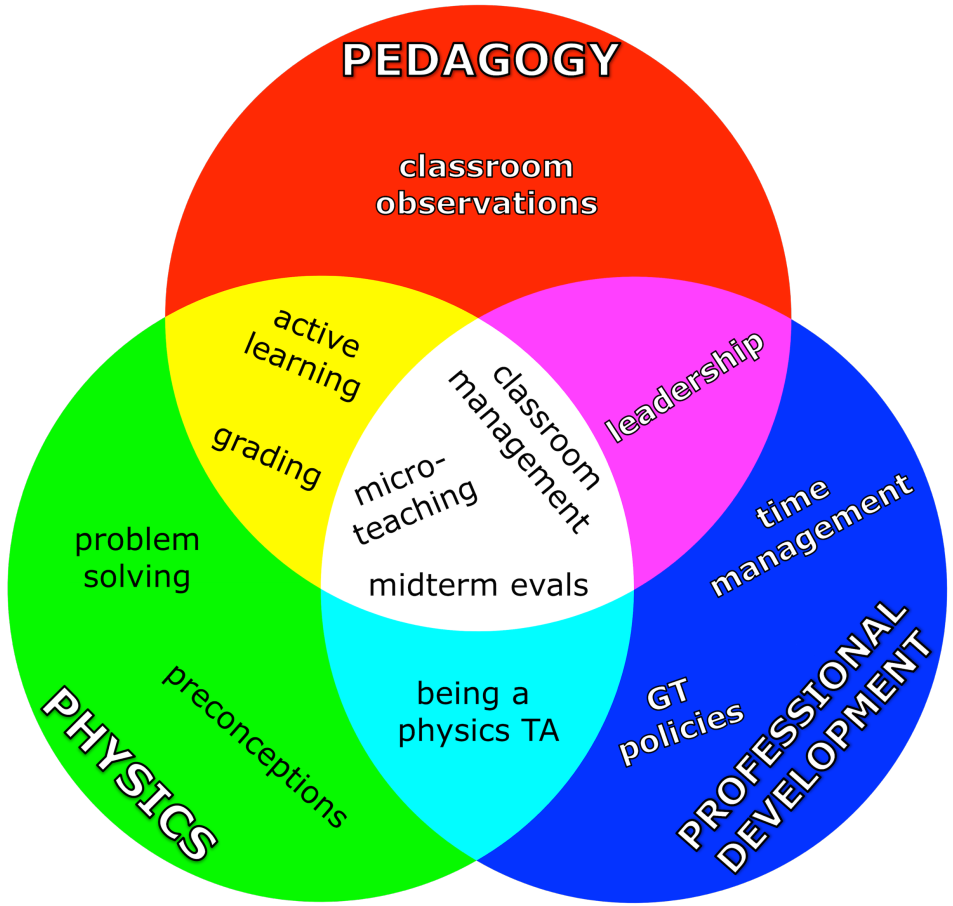
- Redistributed course meeting hours: CETL 8000 =
  - *Jump-Start to Teaching* before semester starts +
  - Class meetings during the semester
- Curriculum is tailored for each department
- Optional for interested Units:
  - Train-the-Trainer model: Super TAs teach CETL 8000
  - Super TAs earn credit towards the *Tech to Teaching* certificate

Content mapping

Evolution of our course content

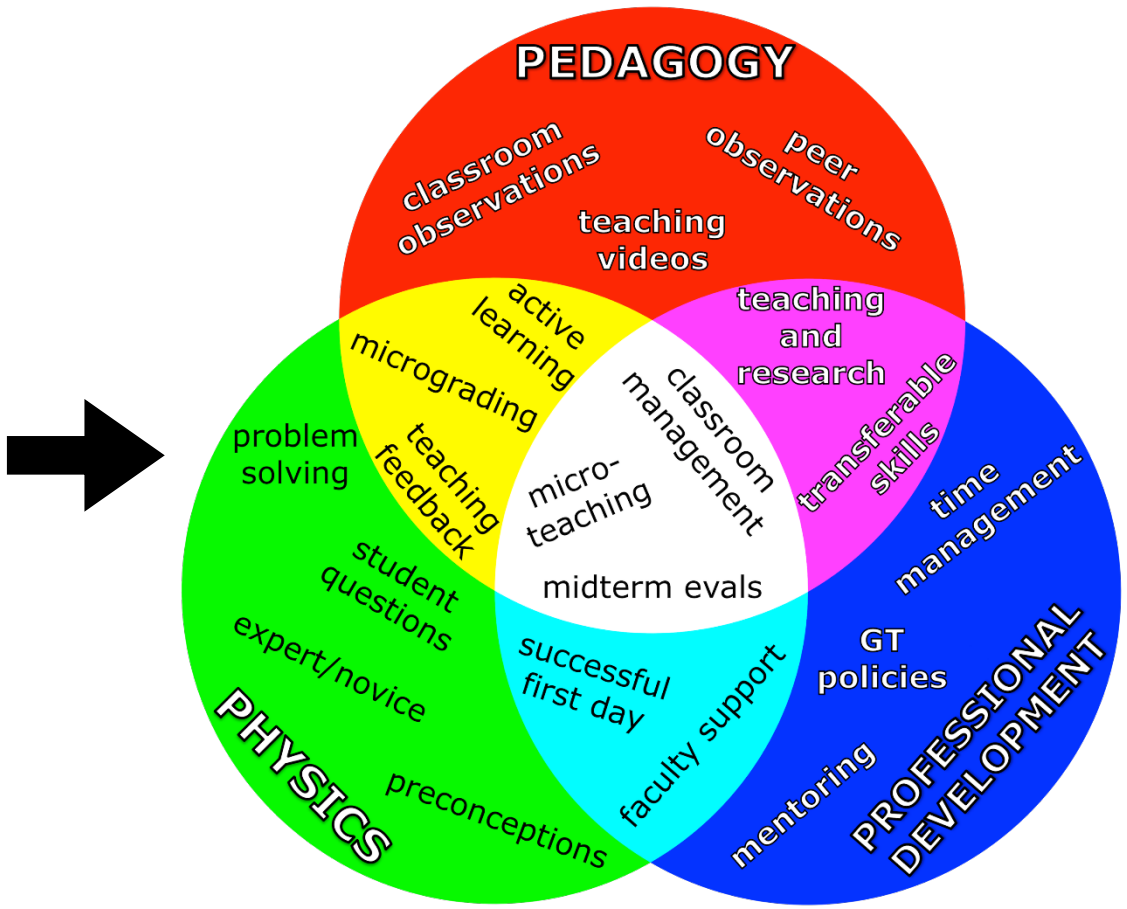


Fall 2013

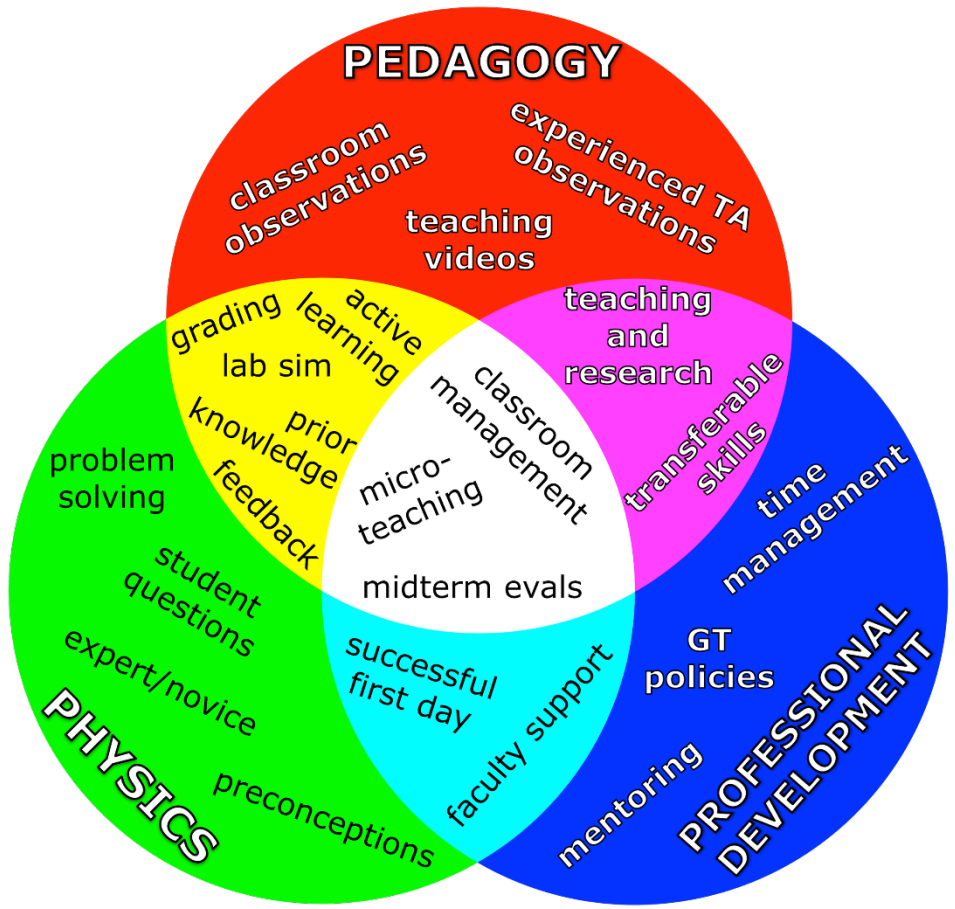


Fall 2014

Evolution of our course content



Fall 2015

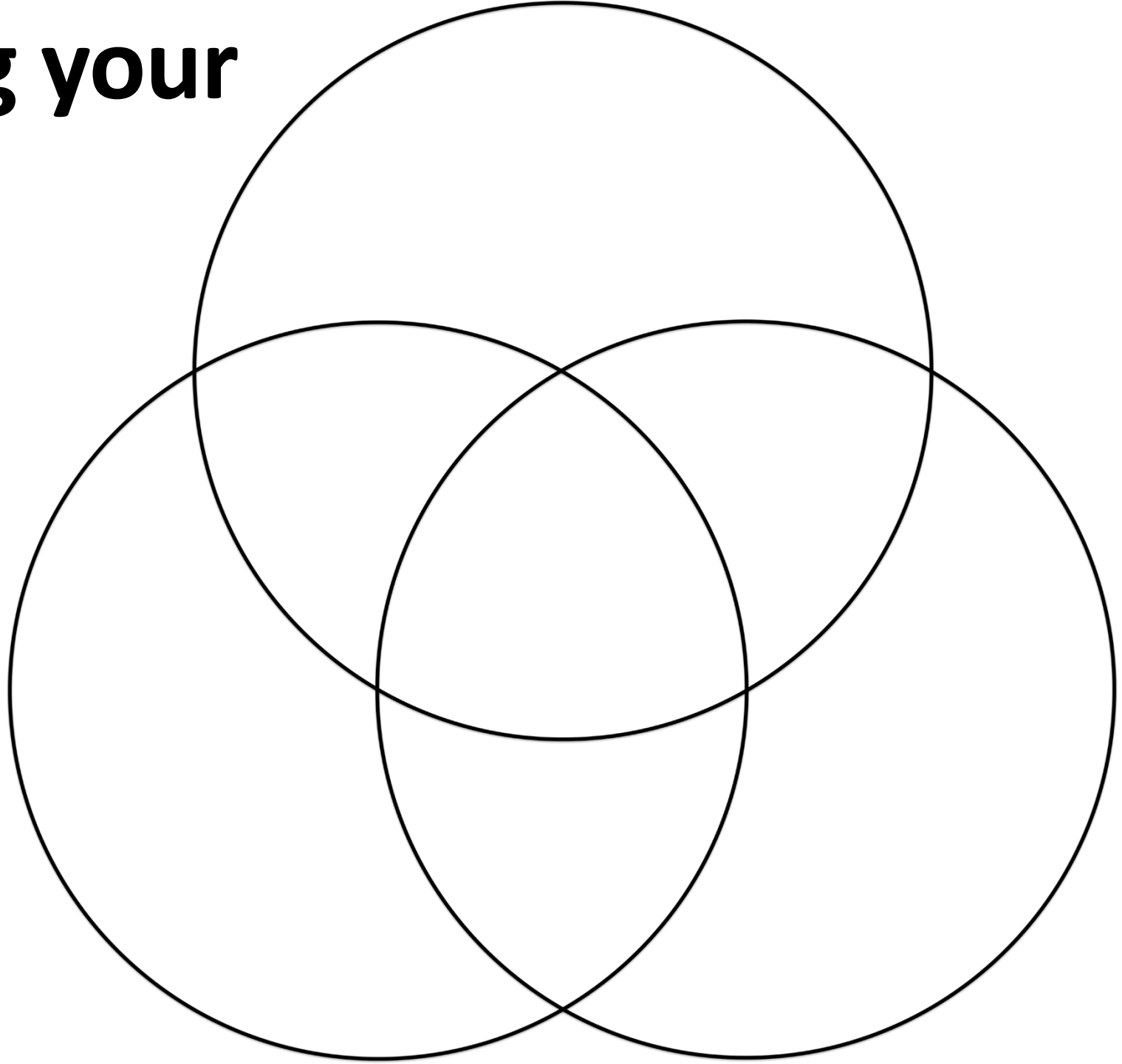


Fall 2016

Your Model

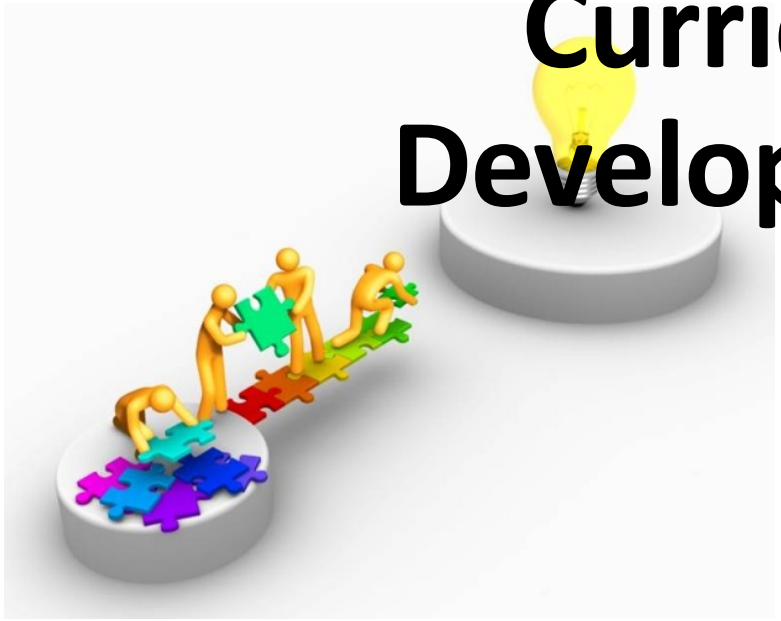
Each partnership is unique, but we've identified some elements likely to be common in most (handout pages 17-19)

Mapping your content



Partnership

Curriculum Development



Implementation

Assessment

Thank you!