Disciplinary TA Development: Partnerships between Centers and Departments

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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

Center for Teaching and Learning (Carol)
- General course content
- Pitching the program to the Department
- Super TA model
- Needs assessment
- Mentoring

School of Physics (Emily)
- TA Experience
- Customizing course content
- Teaching the class
- Conducting research
- Long-term goals

Discipline-based TA Preparation program
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 are 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?

(Hestenes et al. 1992)
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?
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

Pedagogy
- Group work
- Active learning
- Explaining
- Classroom management
- Teaching philosophy
- Micro-teaching
- Midterm evaluations
- Grading
- Time management

Physics

Professional development

Fall 2014

Pedagogy
- Classroom observations
- Active learning
- Classroom management
- Leadership
- Problem solving
- Grading
- Micro-teaching
- Midterm evaluations
- Being a physics TA
- GT policies
- Time management

Physics

Professional development
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

Implementation

Curriculum Development

Assessment
Thank you!