## Lessons learned from a decade of GTA preparation

#### **Emily Alicea-Muñoz**

🗹 ealicea@gatech.edu

SUMMER MEETING July 6 - 10 Boston, MA Georgia Tech College of Sciences School of Physics

## The need for GTA preparation

- Students in large-enrollment intro physics classes spend up to half of their in-class contact hours supervised by GTAs (labs, recitations, tutoring...)
- Potential to have large impact on student learning
- GTAs are novice teachers, sometimes have zero prior teaching experience

#### • GTAs need preparation for teaching!







#### **GTA preparation works!**

- Research shows that training improves GTAs' confidence and selfefficacy, enhances GTAs' pedagogical content knowledge, and can result in the adoption of learner-centered teaching strategies
- GTAs need to have the opportunity to practice and receive feedback on their performance, both before and during their teaching



Otero & Alicea-Muñoz. Research on the Development of Faculty, Graduate Teaching Assistants, and Undergraduate Learning Assistants. In *The International Handbook of Physics Education Research: Teaching Physics*. AIP Publishing (2023)

#### **Physics GTA Preparation at GT**

- One credit, pass/fail, required for first-time GTAs, offered every Fall semester
- **3P Framework** integration of **pedagogy**, **physics**, and **professional development** results in GTAs who are motivated and effective teachers and helps GTAs develop transferable professional skills
- Structure: Orientation (before semester begins), Follow-Up Meetings (during semester), Out-of-Class Activities





Alicea-Muñoz et al, Phys. Rev. Phys. Educ. Res. 17, 020125 (2021)

#### **Program Assessment**

- 245 graduate students total (first-year PhD students, 2013-2023)
- Assessment period spans 2014-2022
  - 152/198 graduate students signed informed consent (77%)
  - 30% women, 36% international, 43% have prior TA experience
- Mixed-methods assessments spread throughout Fall semester:



#### **Initial conditions of first-time GTAs**



#### **Initial conditions of first-time GTAs**



#### **GTAs feel better prepared for teaching after going through the Orientation**

- Same question asked before Orientation (Entry Survey) and after (Orientation Survey)
- "How prepared do you feel for your first GTA assignment at Georgia Tech?"
- Very large effect size (Cohen's d = 1.126)



# At the end of the semester, GTAs indicate the class in general was useful

- 5-point Likert items, one for each session in Orientation, Follow-Ups, and Activities
- Utility score: mean of means in each category
- Course overall:
  3.71 ± 0.08 (M ± SE)
- Orientation always considered most useful



### **Approaches to Teaching Inventory**

- ATI: research-validated instrument\* to determine how teachercentered or learner-centered is an instructor's approach to teaching
- 16 Likert items creating two 8-item Likert scales, one for teachercentered and one for learner-centered
- GTAs fill out ATI before the Orientation (pre) and again on the last day of classes (post)
- Our results are mixed but trending more towards learner-centered



\* Trigwell & Prosser, Educational Psychology Review, 16, 4 (2004)

#### **Approaches to Teaching Inventory**



#### Summary

- First-time GTAs are concerned about content mastery and time management, among many other things
- GTAs consider teaching to be an **important** part of their professional development as physicists
- GTAs feel **better prepared for teaching** after participating in a week-long Orientation, and consider a semester-long preparation course to be generally useful (but not as useful as the Orientation by itself)
- GTAs who participate in GTA preparation generally adopt more **learner**centered teaching approaches





Email me if you have questions or would like to know more: ealicea@gatech.edu

