Lessons learned from a decade of GTA preparation

Emily Alicea-Muñoz

ealicea@gatech.edu
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 self-efficacy, 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.
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

• 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:

   Entry Survey → Pre-Test → Orientation Survey ↔ Assessments → Post-Test → Exit Survey → Student Evaluations

   July → August → September → October → November → December

   Orientation → Start of Fall Semester → End of Fall Semester

Alicea-Muñoz et al, in preparation (2024)
Initial conditions of first-time GTAs

- GTAs have various concerns about their first teaching experience
- Content mastery and time management are the most common concerns

Alicea-Muñoz et al, in preparation (2024)
Initial conditions of first-time GTAs

GTAs overwhelmingly agree with this statement:

“I consider teaching to be an important part of my professional development as a physicist”

Alicea-Muñoz et al, in preparation (2024)
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

Alicea-Muñoz et al, in preparation (2024)
Approaches to Teaching Inventory

• ATI: research-validated instrument* to determine how teacher-centered or learner-centered is an instructor’s approach to teaching

• 16 Likert items creating two 8-item Likert scales, one for teacher-centered 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


Alicea-Muñoz et al, in preparation (2024)
Approaches to Teaching Inventory

Alicea-Muñoz et al, in preparation (2024)
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.

Scan for GTA preparation materials and research.

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