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!
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**

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

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

N = 393

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 find the Orientation useful

Microteaching was a valuable practical experience.
Going through the Orientation before the TA'ing is helpful.
The ok/not-ok game was useful for clarifying GT policies.
I feel better prepared to be a TA after the Orientation.
The pair and group activities were useful.
There was a good balance between lecture and activities.
The Orientation sessions were [not] a waste of time.
The ok/not-ok game was entertaining.
I liked working on real introductory physics problems.
The handouts/resources have been useful.
My concerns about teaching were addressed properly.
I expect the Follow-Up Meetings will be useful.
The Lab Simulation was a valuable practical experience.
I would [not] have preferred more lecturing than activities.

Overall: 4.28 ± 0.05 (M ± SE)
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)

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