A National Survey of Physics Graduate TA Preparation

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Pilot Survey of GTA Prep

- Needed because undergraduate students spend roughly half of their in-class time supervised by GTAs
- No "one size fits all" for GTA preparation nationwide; also, no information of nationwide practices available and their effectiveness
- Pilot survey of 15 randomly selected institutions (from AIP roster of physics departments), conducted in April 2022
- **Goals:**
  - Exploring the different GTA preparation strategies along with their measured effectiveness
  - Provide info to allow institutions to review and select the best strategies of GTA prep that suit the needs of their students in creating motivated and effective teachers

External/Internal Preparation

External preparation (outside department) limited to a singular 3-hour session without measurement of effectiveness in one respondent school

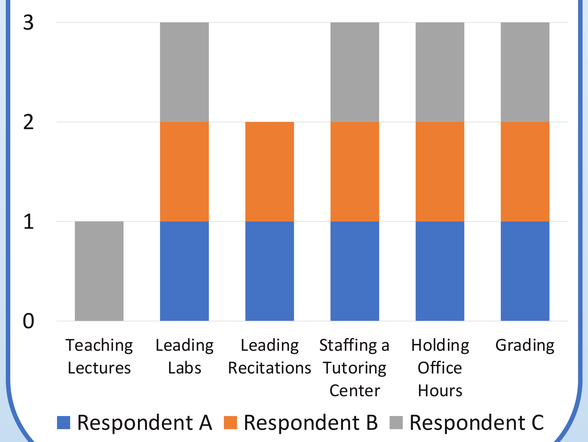
Internal preparation (inside department) usually occurs the week before the start of the semester

- Diversity among who runs the program: tenure-track faculty, grad students, etc.
- Effectiveness was measured by direct observation of GTA's, teaching evaluations from students, and GTA satisfaction surveys
- Respondents A and B:
  - Covered pedagogy as well as course content
  - Have continual trainings/meetings/feedback throughout the term

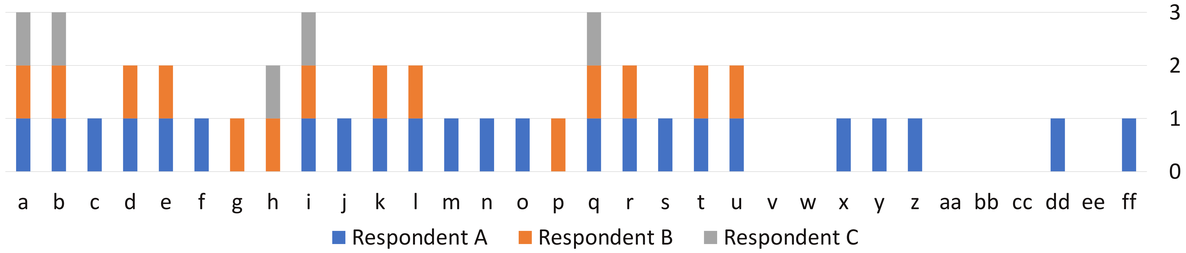
Respondent Overview

- 20% response rate
- All 3 respondents were from R1 institutions in the western US
- Respondent A
  - 6 days of prep followed by weekly meetings and monthly workshops
- Respondent B
  - 6 hours of prep followed by 1.5-hour weekly meetings
- Respondent C
  - 20 hours of prep

GTA Responsibilities



Topics Covered in Preparation



a. University rules and policies (e.g., academic misconduct, FERPA, etc.)
b. GTA duties, responsibilities, and expectations
c. Discussion of the syllabus/content for the course(s) the GTAs will be teaching
d. How to have a successful first day of class
e. Short teaching practice(lecture)
f. Short teaching practice (problem solving)
g. Short teaching practice (lab)
h. Preparation and setup of lab equipment
i. Strategies for effective/efficient grading
j. Classroom management strategies
k. Lab room management strategies (facilitating labs where students work in groups)
l. How to facilitate group work and/or cooperative learning
m. How to facilitate and coach students in problem-solving sessions
n. How to identify students' difficulties and common mistakes in problem solving
o. Expert/novice issues in the physics classroom
p. How to develop engaging explanations
q. How to address conceptual physics misconceptions
r. Discussion techniques for answering students' questions
s. How to motivate students and keep them motivated
t. Pedagogy and general learning theory
u. Active learning in the physics classroom
v. Bloom's taxonomy of higher-order thinking
w. Learning styles
x. Metacognition in problem solving
y. Formative and summative assessment
z. Giving and receiving feedback on teaching
aa. Philosophy of science and science teaching
bb. How to develop leadership skills
cc. Scientific communication
dd. Developing an identity as teachers, researchers, and physicists
ee. Professional development
ff. Time management
gg. Other: [free response]

Likert Analysis

Respondents	A	B	C
In general, our graduate students arrive at our department already well **prepared** to teach.	Neutral	Agree	Disagree
In general, our graduate students do an **excellent job** the first time they work as GTAs.	Strongly Agree	Agree	Disagree
In general, our graduate students **value the experience of teaching** as part of their professional development as physicists.	Strongly Agree	Agree	Disagree
In general, our graduate students feel **confident** in their teaching skills when they enter the classroom as first-time GTAs.	Agree	Neutral	Disagree
In general, our undergraduates are **satisfied** with the educational experience they receive from our first-time GTAs.	Strongly Agree	Agree	Agree
There is no need for our department to provide **additional discipline-based preparation** for our GTAs.	Strongly Disagree	Neutral	Strongly Disagree

Discussion and Future Investigations

- Majority of schools utilize GTAs to aide in undergraduate courses, and the majority require training
- Higher satisfaction with GTA preparation is correlated with continual training/feedback that discusses more aspects of both content and pedagogy

Complete Nationwide Survey with More Extensive Questions