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

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

- Teaching Lectures
- Leading Labs
- Leading Recitations
- Staffing a Tutoring Center
- Holding Office Hours
- Grading

Respondent A: Neutral
Respondent B: Agree
Respondent C: Disagree

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]

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