

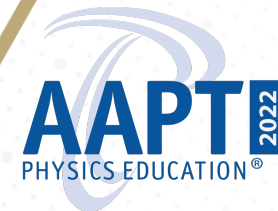
Classroom Observations as part of TA Training

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read along! →



SUMMER MEETING
July 9 - 13 Grand Rapids, MI



Georgia Tech College of Sciences
School of Physics

The need for TA preparation

- Students in large-enrollment intro physics classes spend up to half of their in-class contact hours supervised by TAs (labs, recitations, tutoring...)
- Potential to have large impact on student learning
- Graduate and undergraduate TAs are novice teachers, may have zero prior teaching experience
- **TAs need preparation for teaching!**
- They haven't learned to swim yet so don't throw them into the deep end without first giving them "water-wings of TA preparation" 😊



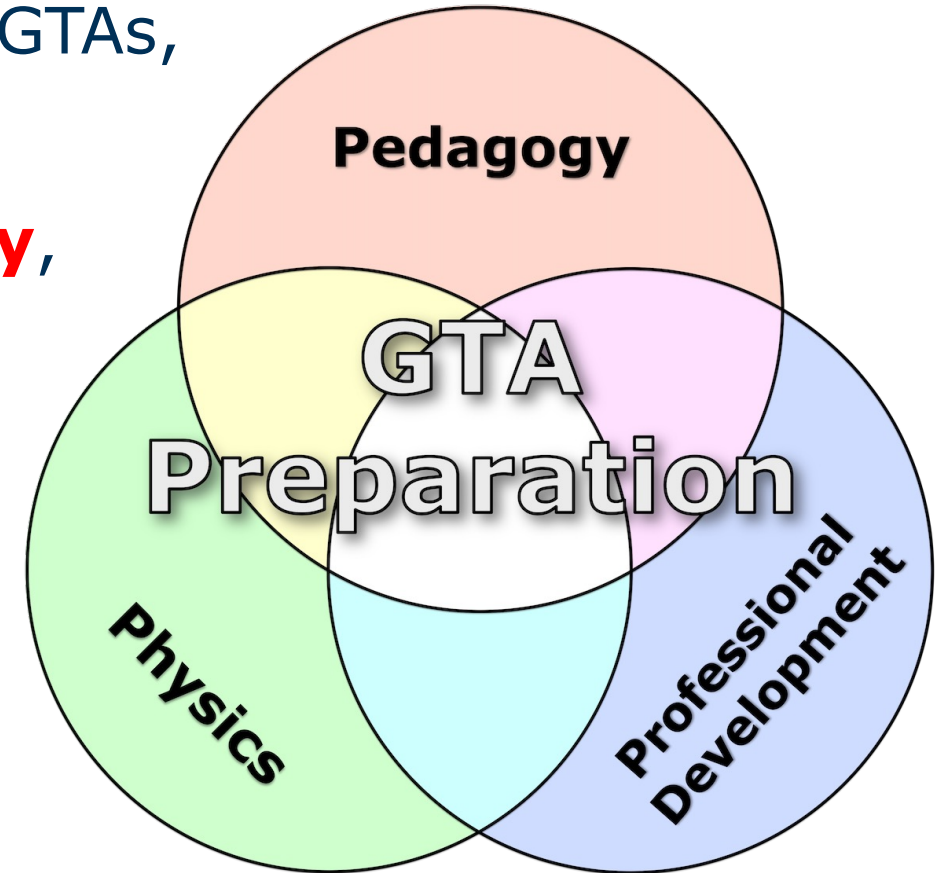
TA preparation works!

- Research shows* that training improves TAs' **confidence** and **self-efficacy**, enhances TAs' **pedagogical content knowledge**, and can result in the adoption of **learner-centered** teaching strategies
- TAs need to have the opportunity to **practice** and **receive feedback** on their performance, both before and during their teaching
- The best way to know what TAs are doing in the classroom is to **watch them teach** and provide them with useful **feedback** for reflection and improvement

* Alicea-Muñoz, PhD Dissertation, Chapter 2; Georgia Tech (2020)
<https://smartech.gatech.edu/handle/1853/62714>

Physics GTA preparation at GT

- One credit, pass/fail, required for first-time GTAs, offered every Fall semester since 2013
- **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**



* Phys. Rev. Phys. Educ. Res. 17, 020125 (2021)

Classroom Observations

- One of the **Out-of-Class Activities** in our GTA preparation program
- Goal is to observe each GTA **twice** per Fall semester:
 - Observation #1 in early September (around week 3-4 of the semester)
 - Observation #2 in late October (around week 10-11 of the semester)
- Caveats:
 - Some semesters have had one single observation due to logistics problems (e.g., semesters in which there are 30+ first-time GTAs)
 - Fall 2020 (the COVID fully-remote semester) had zero observations
 - Observations are **VERY time-consuming**; sometimes I have a TA that assists me (😊), but other times I'm all by myself (😞)



Classroom Observations

- **Benefits:**

- Get to see exactly how the TAs are teaching
- More reliable than self-reporting on effectiveness of training
- Catch bad teaching practices before they become habit
- Feedback allows TAs to improve their teaching

- **Drawbacks:**

- Can't observe ALL the teaching, all the time, for all TAs
- Surprise observation could catch TA on a bad day; pre-scheduled observation could lead TA to prepare extra hard for that one single time
- Student-TA interactions could be quantum phenomena (observation affects the outcome)



Observations checklist

- Pre-observation survey
- Scheduling the observations
- The observations:
 - Option for **video recording** (recommended but not required)
 - Each TA observed for **30 minutes** (labs are 2-3 hrs, recitations are 1hr)
 - Review observation (watch video or read notes taken),
 - Use **rubric** to write **feedback**, then send feedback to TA via email
 - Repeat for second observation
- After receiving feedback from both observations, TA writes **reflection** on the feedback received



Pre-observation survey

- Sent to TAs during first week of classes
- Google Form:
 - Name
 - Class you are teaching
 - Teaching schedule (day/time/location), first and second preference [for each observation]
 - Video recording [yes/no]
 - **Name one aspect of your teaching for which you want focused feedback** [for each observation]
- All are required fields – last item forces TAs to think about specifics (not just “general feedback please”)



Scheduling the observations

- Attempt to honor first-preference for each TA's observations, but sometimes not possible
- Possible logistics issues:
 - Scheduling around your own teaching schedule
 - Some labs are late at night – may cause issues for observers (e.g., family obligations, can't drive at night, etc)
 - Some labs/recitations happen at the same time – a single observer can't be in two places at once
 - Too many observations in one single week can be exhausting – results in observations spreading over 2-3 weeks, depending on how many observers
- Share observations schedule with TAs as soon as it's set



Observation rubric

- Nine evaluation criteria, scored in a four-point scale
- Rubric created in-house, modified several times as needs arose; current rubric is Version 4.1*
- Note: research-validated observation protocols exist (e.g., RIOT, TA-IOP, RTOP, COPUS, LOPUS), but we have not used them so far (future plans)

* Version 4 appeared in Phys. Rev. Phys. Educ. Res. 17, 020125 (2021); small edit in 2022 to have more inclusive language

GTA Evaluation Criteria
Uses the first 10 minutes of recitation/lab effectively
Speaks with a clear, audible, and well-modulated voice
At the board, the GTA's handwriting is legible
Shows enthusiasm for physics and tries to motivate students
Checks for student understanding by asking probing questions (without sounding condescending)
Helps students develop the necessary problem-solving skills and coaches them without giving away the answers
When students are working in groups, the GTA makes sure that all group members are actively participating
Spreads their time reasonably among the various groups of students in the lab/classroom
Comes to the lab/recitation prepared and can think on their feet if there's a need for troubleshooting

Video recording equipment

- 2014 – 2018: borrowed a camera from IT, sometimes also a mic
 - Issues: unreliable, always depending on whether the equipment was available, couldn't always get a microphone which resulted in low-quality audio
- 2019 – present: managed to convince the Chair of the need for dedicated classroom observation equipment (yay!)
 - ~ \$3000 budget, to buy two sets of equipment
- Possible near future (2023? 2024?): camera+mic at each lab table
 - If approved by IT...
 - Potential improvement: non-intrusive “invisible” recording



Video recording equipment

Item	Cost Per Item	N	Total
Canon VIXIA HF G50	\$ 1,099.00	2	\$ 2,198.00
Canon Extra Battery and Charger	\$ 36.95	2	\$ 73.90
Wireless Lavalier Microphone	\$ 169.99	2	\$ 339.98
Rechargable batteries and charger	\$ 17.99	2	\$ 35.98
Lightweight foldable headphones	\$ 22.96	2	\$ 45.92
256GB SD Card	\$ 77.44	2	\$ 154.88
AmazonBasics Gadget Bag	\$ 22.60	2	\$ 45.20
Heavy Duty Video Tripod	\$ 128.99	1	\$ 128.99
Totals	One set \$ 1,575.92		Two sets \$ 3,022.85

Notes:

All items
purchased on
Amazon

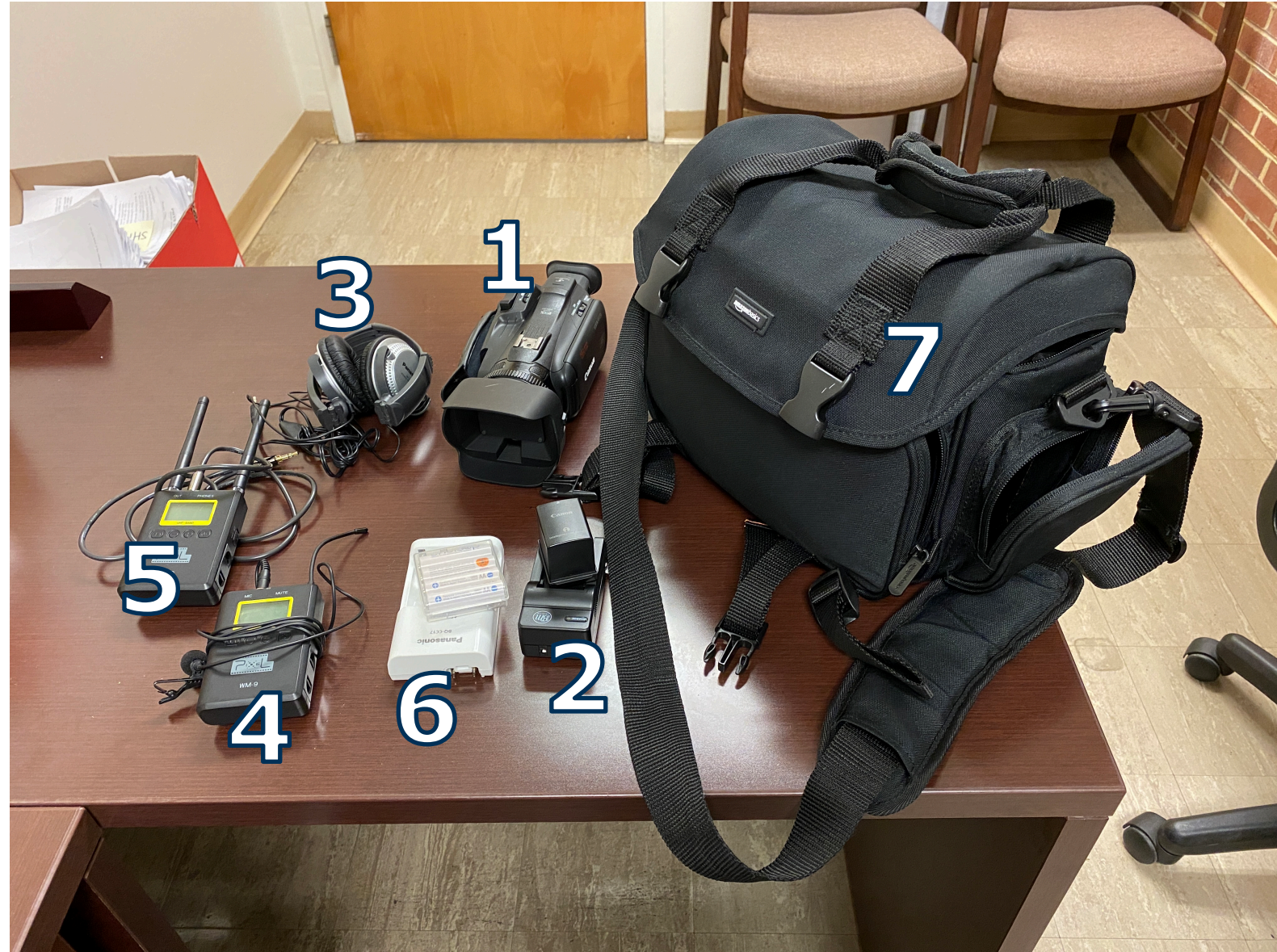
Prices are
from 2019



Video recording equipment

1. Camera
2. Extra camera battery
3. Headphones
4. Microphone
5. Mic receiver
6. Rechargeable batteries and charger
7. Carrying case

Not pictured: tripod, SD card



During the observations

- Determine what time in the lab you'll observe the TA
 - Start of lab/recitation: good for observing pre-lecture, not good for observing interactions with students
 - Middle of lab/recitation: good for observing interactions with students, but can't observe the lab pre-lecture
 - Never schedule to observe near the end – many students will have left already
- Announce the observation to the students
 - Assure them that video won't show up on social media
- If no video, follow TA around with a clipboard to take notes
- If video, give TA microphone, follow TA around with camera
- Leave after 30 minutes



Sample clip from an observation



After the observations

- Rest your camera-holding arm
- Upload videos to Dropbox
- Watch video recordings or re-read notes to write feedback to TA
 - Pro-tip: watch videos in 1.5x – 2x speed!
- Email each TA:
 - Filled-out rubric and written feedback
 - Link to their own video(s) on Dropbox
 - Offer for one-on-one meeting to discuss observation and feedback
- Debrief with other observers (if more than one person doing observations)



Observation reflection

- Assignment counted towards GTA preparation course grade
- Forces TAs to read and reflect on the feedback received

“After you’ve received all your observation feedback, answer the following questions in essay format:

- How does the feedback you received from your instructors differ from the feedback you received at the microteaching practice?
- Does the new feedback reflect an improvement on your teaching skills? Explain.
- Is there anything that stands out in your feedback that you’d like to discuss?”



Results

- No observations in pilot semester (2013)
- One or two observations per TA per semester since 2014 (except 2020)
- Approximately **620 GB** of video recordings accumulated so far

Year	#GTAs	Observation 1		Observation 2	
		Video	No video	Video	No video
2014	13	9	4	N/A	N/A
2015	34	20	14	N/A	N/A
2016	23	16	7	14	9
2017	26	13	13	N/A	N/A
2018	16	11	5	11	5
2019	18	10	8	7	11
2020	22	N/A	N/A	N/A	N/A
2021	20	13	7	13	7

Results

- Final survey at end of semester asked TAs to rate topics and activities (17 total items)
- Five-point Likert scale
- Classroom observations ranked **#2** in 2015, **#3** in 2016 (but higher score compared to 2015)
- Not pictured: **#5** in 2017 and 2018; analysis not yet completed for 2019 – present

Rank	Item	Score ($M \pm SD$)
2015		
1	Microteaching	4.38 ± 1.07
2	Individual Classroom Observations	3.79 ± 1.29
3	Teaching Physics	3.76 ± 1.06
2016		
1	Microteaching	4.32 ± 0.72
2	Teaching Physics	4.23 ± 0.69
3	Individual Classroom Observations	4.09 ± 1.11
2017		
1	Intro & Georgia Tech Policies	4.38 ± 0.82
2	Microteaching	4.35 ± 1.07
3	Teaching Physics	4.29 ± 1.20
2018		
1	Lab Simulation	4.80 ± 0.41
2	Microteaching	4.67 ± 0.82
3	Teaching Physics	4.33 ± 1.11

What happens to the videos?

- TAs are offered an opt-out: “let me know if you want me to delete your observation videos”
 - 1-2 people ask for their videos to be deleted every year
- Kept videos are used for later TA training
 - Videos of past TAs shown when discussing classroom management
 - More videos of past TAs discussed later in the semester
 - Clips chosen to highlight specific mistakes or things done well
- If TA signed IRB consent form, videos can be used for research
 - But that’s future work...



Summary

- Classroom observations are a useful tool to assess the effectiveness of TA training by seeing first-hand what the TAs do in the classroom
- TAs benefit from feedback given based on classroom observations
- Logistics can be difficult; video recordings help TAs and observers
- Hard to tell if TA-student interactions are affected by observations
- Email me if you'd like to discuss! **ealicea@gatech.edu**

Scan for all my
GTA preparation
materials and
research



For more TA prep research:
see my student **Greg Carroll's**
talk (Session LG) and
PERC poster (Session 1)



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