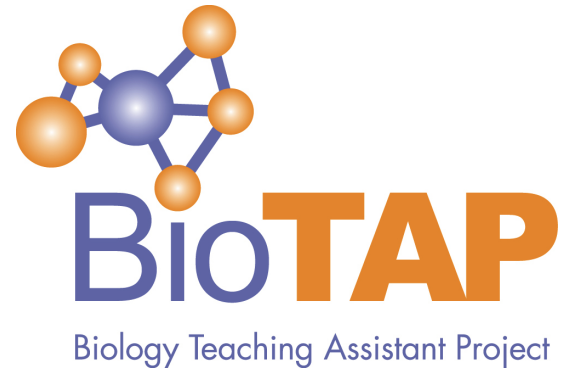


Biology Teaching Assistant Project 2021 Virtual Conference

Monday, November 8, 1:00 PM – 5:00 PM EST
Tuesday, November 9, 1:00 PM – 4:45 PM EST

*Open to all interested in Graduate/Undergraduate Teaching
Assistant Professional Development for Teaching!*



Talk and Discussion Abstracts

Monday, November 8

1:00 – 1:20 PM EST Introduction to the Conference and BioTAP

1:20 – 2:20 PM EST Conference Keynote

Measuring what we value: What does it take to transform GTA professional development?,
Daniel Reinholz (San Diego State University)

Abstract: The value of equitable, inquiry-based learning experiences for students are well-documented. However, delivering such learning experiences remains a challenge. In this talk, I draw from my own work on systemic change in STEM higher education and equitable instructor professional development and make connections to the work of GTA professional development. I argue that shifts to departmental culture are crucial for developing a positive teaching culture for GTAs. In addition, I illustrate how data, such as those generated by the EQUIP observation tool (<https://www.equip.ninja>) can play an important role in guiding instructional improvement.

2:25 – 2:45 PM EST

Culturally Responsive Undergraduate Science Education: A training program for justice-focused science teaching, **Hillary A. Barron** (Bemidji State University)

Abstract: Undergraduate science classrooms strive to mimic the broader practices of the scientific community and therefore have tremendous potential to perpetuate the exclusion of certain groups of people. They also have, however, the potential to be a catalyst for equitable participation in science. Utilizing pedagogies of empowerment, such as culturally responsive science teaching, can mitigate the gatekeeping phenomenon seen in science. The CRUSE program (Culturally Responsive Undergraduate Science Education) advances the conversations of equity and social justice in undergraduate science education by creating a localized approach to culturally responsive science teaching that is informed by the views and experiences of biology teaching assistants (TAs) and faculty. At its core, CRUSE aims to ensure that all students – particularly those historically excluded from science – have opportunities to build positive science identities and experiences around science, and maintain a rightful presence. CRUSE furthermore draws on frameworks of anti-racist science teaching to interrogate how to dismantle systemic structures of inequity. There are three focal areas of CRUSE: culturally relevant pedagogy, funds of knowledge, and social justice science issues. This presentation describes each of these domains, and examines how biology TAs and faculty, at multiple institution types, have engaged with and enacted CRUSE teaching strategies.

2:55 – 3:15 PM EST

Avoiding, Minimizing, or Wrestling?: Discussing Uncertainty in Undergraduate General Biology Labs, **Sam Skrob-Martin*** (Florida State University), **Sherry A. Southerland** (Florida State University)

Abstract: Recent calls for reforms in biology education emphasize the need for students to engage in the ways of thinking, feeling, and doing that biologists engage in as they work to explain phenomena. (AAAS, 2011; NRC, 2003.) Part of this engagement involves wrestling with uncertainty, that is the aspect of scientists' work that is unknown or non-obvious (Manz, 2018)). The ways in which students engage with such uncertainty is influenced by their interactions with instructors. This study examines how teaching assistants support undergraduate students in a non-majors biology lab as they navigate uncertainty during lab investigations. Four of 16 undergraduate TAs of a General Biology Laboratory course for non-science majors were involved in this study. Small group interactions between the TAs and students were recorded and transcribed to describe how the students and TA navigated through scientific uncertainty. We categorized how the four TAs navigated through uncertainty noting if they avoided the uncertainty or wrestled to resolve it. All four of the TAs had different approaches to uncertainty, including avoidance by making the work procedural or wrestling by encouraging students to work through the unknowns. Implications in regards to TA support and student disciplinary engagement will be discussed.

3:15– 3:30 PM EST **BREAK** (get a snack, walk around, come back!)

3:30 – 4:25 PM EST

Nascent Idea Discussion: A Research Coordination Network in Undergraduate Biology Education (RCN-UBE) for Scientific Writing Instructors, **Dan Johnson** (Wake Forest University)

Abstract: NID will assess interest, identify collaborators, and inform content of an RCN-UBE application (due 1/24/22) to connect those who train TAs to teach scientific writing. Discussion questions are:

1. Problem: Who trains your GTAs to teach scientific writing? Is their strategy evidence-based?
2. User needs: What would you want to know or learn more about related to teaching scientific writing? What measures would be most meaningful? What training tools or resources do you need?
3. Interest, challenges: Do you have students, TAs that could participate? What are your barriers to participation?

4:30 – 4:50 PM EST

“How might you explain what happened?”: Fostering sensemaking in a biology lab through educative curricular supports for TAs, Alyssa Freeman, Anna S. Grinath (Idaho State University), Angela Google, Zhigang Jia, Tina Carter (Middle Tennessee State University)*

Abstract: Due to the crucial role of teaching assistants (TAs) to the health of biology departments, they should be provided supports to meet instructional goals and promote an equitable learning environment. Ambitious Science Teaching (AST), is one way that promotes teacher use of talk moves to support students to reason through talk with peers and as a class. However, promoting rigorous explanatory talk is challenging and TAs need to be provided supports through educative curriculum materials integrated into a program of professional development. This research focuses on four case studies of undergraduate TAs who were tasked with implementing features of AST in an introductory biology lab course when provided educative supports. We examined one way that TAs engaged with educative supports by coding annotations TAs made in their written curriculum guide according to the type of teaching knowledge it represented (content, pedagogical, or pedagogical content knowledge). We also analyzed the explanatory rigor of student talk in the classroom when TAs implemented elicitation and explanation discussions. This allowed us to explore how TAs use of the educative supports (annotations) was related to the explanatory rigor of student talk. We found that early in the semester TAs made more annotations related to pedagogical content knowledge. As the semester progressed, TAs made fewer annotations, yet were increasingly successful at supporting rigorous explanatory talk. These findings provide insight into TA learning, and suggest, that as TAs learn how to effectively use talk moves, they change how they use educative supports by writing fewer annotations.

4:50 – 5:00 PM EST Day 1 Conclusion and invitation to Social Hour

8:00 - 9:00 PM EST SOCIAL HOUR

We're not *really* strangers. Get to know other people interested in the scholarship of Teaching Assistant Teaching Professional Development through a game of "We're Not Really Strangers." Intrigued? Come and perhaps leave with a new friend, colleague or collaborator.

Return tomorrow at 1:00 PM EST for Day 2

Tuesday, November 9

1:00 – 1:05 PM EST Welcome back

1:05 – 1:25 PM EST

*Talk moves as pedagogical tools for eliciting and working with student ideas in an undergraduate biology laboratory, **Evan Barnes** (Westmont College), **Ron Gray** (Northern Arizona University), **Anna S. Grinath** (Idaho State University)*

Abstract: This study described how TAs use talk moves as pedagogical tools to elicit and work with student ideas. We examined how TAs sequence talk moves during an elicitation discussion at the beginning of an undergraduate laboratory investigation. Our research question was: What qualitative patterns emerge in the sequencing of TA talk turns that elicit students' initial and exploratory ideas about the anchoring phenomenon of a biology lab investigation? We analyzed transcripts of 18 episodes of the same planned elicitation discussion (Week 8: Trophic Web Lab). We coded TA talk turns according to talk moves from the ambitious science teaching framework (Windshittl et al., 2018) and we coded the explanatory rigor of student talk turns at level 1, 2, or 3 (Thompson et al., 2016). We qualitatively analyzed patterns in sequencing of talk moves and student contributions across the 18 episodes. Our findings describe specific patterns of sequencing that either elevated or constrained the rigor of student talk. These findings have implications for designing TA professional development (PD) to support productive sequencing. This study also provides exemplars from university classrooms that can be used in TA PD to illustrate how to use talk moves as pedagogical tools.

1:30 – 2:25 PM EST

*Nascent Idea Discussion: Crafting a Blueprint for the Next Decade of Education and Scholarship on Graduate Teaching Assistant Professional Development, **Jeffrey T. Olimpo** (University of Texas at El Paso), **Amy Pate** (Arizona State University), **Amie M. Kern** (University of Texas at El Paso)*

Abstract: National reports have long emphasized the need to engage undergraduate students in high-impact practices (HIPs; e.g., field experiences; CUREs) designed to promote their success and persistence in STEM. Despite the increasing prevalence of graduate teaching assistants (GTAs) as facilitators of these experiences, there remains a critical need to explore the professional development (PD) provided to said GTAs and the outcomes associated with GTA involvement in HIPs. In this interactive session, attendees will work alongside the session facilitators and their peers to identify and outline areas of focus for future GTA PD efforts (e.g., inclusive teaching; mentoring). Attendees will likewise be encouraged to form collaborations with other participants interested in similar areas of GTA PD education and scholarship.

2:25 – 2:40 PM EST BREAK (get a snack, walk around, come back!)

2:40 – 3:00 PM EST

*Teaching assistant peer observation of labs and tutorials increased confidence, community and mindset in both novice and veteran TAs, **Cassandra Debets** (Simon Fraser University and University of Manitoba), **Megan Barker** (Simon Fraser University)*

Abstract: Teaching Assistants (TAs) usually have little formal teaching experience or training and may go into a teaching role with low confidence, and a lack of teaching community. One approach to providing TAs with training is peer observation. Thus, we investigated how to further improve teaching assistant's professional and pedagogical development using peer observation. We surveyed the TAs pre- and post- peer observation. In our surveys we used both Likert and long form style questions asking TAs about confidence, connection to other TAs (community), and their teaching abilities. We surveyed TAs pre and post peer observations. Using a concurrent triangulation design, we coded the survey responses into themed categories (negative, neutral, positive, and pedagogical). TAs strongly agreed with having confidence, and a sense of community in the post peer observation survey compared to the pre survey. Novice TAs reported increased confidence and sense of community compared to veteran TAs in long form responses. No novice TA felt connected to other TAs prior to the peer observation. We saw an 18% increase in positive codes to questions regarding confidence in our post surveys compared to pre peer observation. Using peer observation can advance how we both train and promote community among TAs.

3:05 – 3:25 PM EST

*How involving peer educators in curriculum development improves their own statistical training in the process of helping their peers, **Brent Stoffer, Brooke Lyman, Ally Boggs, Samantha Ashmore** (University of Cincinnati)*

Abstract: Incorporating statistics into biology curricula is essential for students to learn the foundations of data management, analysis, and visualization in a biological context. Here, we summarize the benefits of using peer educators in introductory biology labs at the University of Cincinnati in order to revamp the statistical curriculum of the course, with a special emphasis on ways to improve the undergraduate TA's own knowledge and transferable skills. Modifications to the course included the addition of resources such as video tutorials, standardized PowerPoints, worksheets, and pre-lab assignments, many of which were developed by UTAs in the course. A Data Exit Exam was also created in order to assess student understanding of hypothesis-testing, statistics, and graphing through a UTA senior capstone project. Further, we developed a Statistics Team, a group of UTAs each semester that are devoted specifically to developing the statistical curriculum of the course. In doing so, not only has there been significant improvement in student Data Exit Exam scores from 2018 to 2020, but there has also been qualitative feedback suggesting that the UTAs themselves have enhanced their own statistical understanding and skillset. Therefore, by including peer educators directly in the process of curriculum development, it creates opportunities for further professional development of a transferable skill that is useful across an array of future job opportunities.

3:30 – 4:30 PM EST Community Discussion: The Future of BioTAP

Although NSF funding for the Biology Teaching Assistant Project has expired, we have started to form groups to carry the work of the network forward. In the last four years, BioTAP has grown a community of scholars, like you, interested in research on biology teaching assistant teaching professional development. We are excited about the new directions these scholars may take BioTAP. Now is a critical time for *you* to help shape the future of BioTAP, so please join us to discuss plans and share new ideas to help BioTAP grow, transform, and reflect the needs of everyone in the network for years to come.

4:30 – 4:35 PM EST Closing

The Biology Teaching Assistant Project (BioTAP) was a research coordination network funded by the National Science Foundation (DBI 1539903) to empower universities to use research to improve the quality of graduate student teaching