

Biology Teaching Assistant Project 2024 Virtual Conference

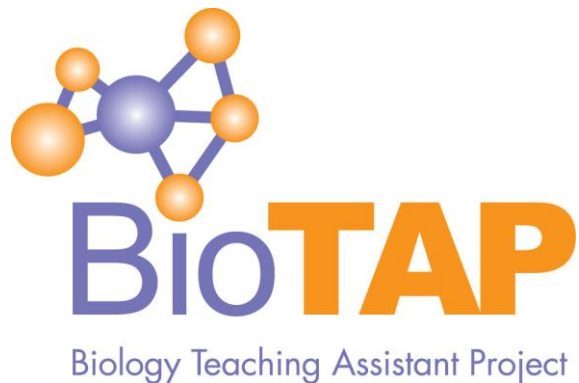
October 24-25, 2024

Zoom link:

<https://ua-edu.zoom.us/j/84363936227?pwd=QPKEyxdYVCDkLFyILgs8AYrted7uDn.1>

Meeting ID: 843 6393 6227

Passcode: 406470



Conference webpage: <https://biotap.org/2024-vconference/>

BioTAP: <https://biotap.org/>

BioTAP 2024 Virtual Conference Schedule at a Glance:

TIME (EST)	Presenter(s)	Title
<u>Thursday, October 24</u>		
1:00 PM		Introduction and Welcome
1:15 PM	Cotner, S.	Keynote - What Do We Know About the Critical Role of TAs in Our STEM Courses?
2:20 PM	Chouinard, A., B. Schussler, & J. Reid	Leadership Update and Community Hour
3:15 PM		BREAK
3:30 PM	Barron, H. A.	<i>Culturally Responsive Undergraduate Science Education</i>
3:55 PM	Sbeglia, G. C. & M. Martin	<i>Seeing Educational Equity: The Development and Validation of the SEE Instrument to Measure Equitable Noticing in STEM Teaching Assistants</i>
4:20 PM	BioTAP Ed Committee	<i>Education Committee Overview</i>
4:30 PM		Day 1 Conclusion
<u>Friday, October 25</u>		
1:00 PM		Welcome back
1:05 PM	Bell, K., Y. Kong, & Y. S. Seo	<i>Impacts of a Large Enrollment Online TA Training/College Teaching Course on Teaching Confidence</i>
1:30 PM	Freeman, A., B. Jangir, M. Said, C. Rolle, K. Riggs, & G. Gardner	<i>Impact of Autonomy on Graduate Teaching Assistant's Pedagogical Discontentment and Self-efficacy</i>
1:55 PM	Rosen, L. & S. Ahmed	<i>What Teaching Assistants Want: Implications for Professional Development</i>
2:15 PM		BREAK
2:30 PM	Akuoko, E. A. & G. Gardner	<i>Levers And Barriers to Graduate Students Teaching Professional Development (GS TPD): Results from Expert Consensus Using Delphi Methodology</i>
2:55 PM	Campo, F. M.	<i>TAs ROCK! Exploring a Master's-level TA-TPD Course for Components of Training that Serve as Sources of Teaching Self-efficacy Using Situational Leadership as a Framework for Delivery</i>
3:20 PM	Calinger-Yoak, K.	<i>Supporting Teaching Assistants as Research Mentors in Course Based Undergraduate Research Experiences (CUREs)</i>
3:45 PM	Majin, A., E. C. Bui, & A. C. Lew	<i>Individualistic and Collectivistic Cultures as Psychosocial Factors that Modify Effectiveness of Written Instructor Feedback</i>
4:05 PM		Closing

BioTAP Leadership:

Executive Members

President-Elect: **Josh Reid**
Acting President: **Adam Chouinard**
Past President: **Beth Schussler**
Treasurer: **Stephanie Gutzler**

Education Committee

Chair: **Kimberly Bell**
Vice Chair: **Petra Kranzfelder**
Megan F. Cole
Star Lee
Jeffrey Olimpo
Emma Goodwin
Marina Ellefson

Networking & Communications Committee

Chair: **Dan Johnson**
Vice Chair: **Kari Hodge**
Cody Smith
Diyala Shihadih

Conference Committee

Chair: **Kaleb Heinrich**
Vice Chair: **Ash Heim**
Amy Keagy
Katie Ingraham Dixie

Keynote Profile:

Sehoya Cotner, Ph.D.

Professor
Department of Biological Sciences
University of Bergen, Norway

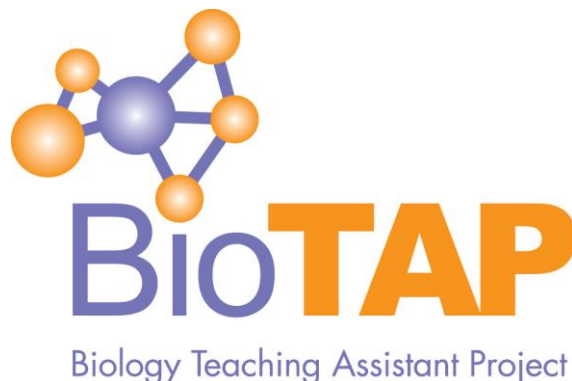
Sehoya Cotner earned her PhD in Conservation Biology at the University of Minnesota-Twin Cities. She is a Professor in Biological Sciences at the University of Bergen (UiB) in Bergen, Norway and an adjunct professor in the Department of Biology Teaching and Learning at the University of Minnesota. At UiB, she directed a National Centre for Excellence in Biology Education (bioCEED), while continuing to lead the EDU-STEM Network in the United States. While at the University of Minnesota, she led Building Excellence in Scientific Teaching (BEST), a TA professional-development program focusing on inclusive teaching in an inquiry-based teaching environment. More recently, she became the director of the new STEM Education Research Center at UiB. She collaborates on several projects that focus on inclusive, evidence-based STEM higher education, and she is also the Editor in Chief for the Nordic Journal of STEM Education. Sehoya has been awarded one of the University of Minnesota's Morse-Alumni Teaching Awards for undergraduate education, the National Association of Biology Teachers Professor of the Year Award, and she is in the Academy of Distinguished Teachers at UiB. She was also selected for the University of Minnesota's "Breaking the Silence" award for GLBTA leadership activities. Her books include *Arguing for Evolution: An Encyclopedia for Understanding Science* (2011, Greenwood Press) and *Understanding Galápagos: What You'll See and What It Means* (2013, McGraw-Hill).



Biology Teaching Assistant Project 2024 Virtual Conference

Thursday, October 24, 1:00PM - 4:30PM EST
Friday, October 25, 1:00PM - 4:15PM EST

*Open to all interested in
Graduate/Undergraduate Teaching Assistant
Teaching Professional Development (TA-TPD)!*



Schedule and Abstracts

Thursday, October 24

1:00 - 1:15 PM EST **Introduction to the Conference and BioTAP**

1:15 - 2:15 PM EST **Conference Keynote**
What Do We Know About the Critical Role of TAs in Our STEM Courses?
Sehoya Cotner (University of Bergen, Norway)

2:20 - 3:15 PM EST **Leadership Update and Community Hour**
Adam Chouinard (Current President, Oregon State University), **Beth Schussler** (Past President, University of Tennessee), and **Josh Reid** (President-Elect, Texas Tech University)

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

3:30 - 3:50 PM EST
Culturally Responsive Undergraduate Science Education, **Hillary A. Barron** (Bemidji State University)

Abstract: Culturally responsive science teaching in college biology continues to be a developing area of scholarship, despite the potential benefits to students who have historically been excluded in STEM disciplines. Professional development and learning opportunities for science instructors in this space have also been slowly evolving. The lasting impact that teaching assistants have on students, however, should make this a high priority. Using constructivist grounded theory methods, this study examines how iterations of a professional development program called Culturally Responsive Undergraduate Science Education (CRUSE) has impacted various groups of teaching assistant instructors.

3:55 - 4:15 PM EST

Seeing Educational Equity: The Development and Validation of the SEE Instrument to Measure Equitable Noticing in STEM Teaching Assistants, **Gena C. Sbeglia** (San Diego State University) and **Makenna Martin** (University of San Diego)

Abstract: The act of noticing inequities in education is demonstrably challenging and requires purposeful learning by the educator. But noticing is often a prerequisite to action, motivating the education community to focus on this construct, particularly as it relates to learning. However, despite its importance, there are few studies on teacher or TA noticing of equity, especially in large undergraduate courses, which are among the most problematic educational spaces. The SEE instrument is the first tool designed to measure Tas' ability to "See" Educational Equity in large enrollment STEM courses. In this talk, we describe the instrument, the grounding framework, the validity evidence gathered, and preliminary results.

The SEE framework is organized into six categories of equity-related classroom events drawn from Tanner (2013) and Couch et al. (2015): 1) course alignment, 2) science practices, 3) student participation, 4) cultural engagement, 5) classroom organization and structure, 6) feedback. Because noticing something has been conceptualized as related to, but distinct from, knowing about something, the instrument derived from this framework separately measures knowledge about equity (48 multiple choice items) and noticing of equity (20 multiple choice, ranked comparison, and free response items). We gathered validity evidence for the framework and items using AERA's construct validity framework (2014). Two expert interviews and 28 TA "think-allowed" interviews informed iterative framework and instrument revisions. A sample of 34 undergraduate TAs demonstrated the least knowledge about the cultural engagement category and most about the science practices category. There was also a moderate positive relationship between knowing and noticing ($r(34) = 0.55, p < 0.001$), and knowledge significantly predicted noticing ($F(1,32) = 13.5, p < 0.001$). This work is an important step forward in advancing the measurement and professional development of Tas' ability to notice educational inequities in the nation's most problematic classrooms.

4:20 - 4:30 PM EST

Education Committee Overview, **BioTAP Education Committee**

4:30 PM EST

Day 1 Conclusion

Return tomorrow at 1:00 PM EST for Day 2

Friday, October 25

1:00 - 1:05 PM EST

Welcome back

1:05 - 1:25 PM EST

Impacts of a Large Enrollment Online TA Training/College Teaching Course on Teaching Confidence, **Kimberley Bell** (Stony Brook University), **Yiren Kong** (Stony Brook University), and **Young Sik Seo** (SUNY Buffalo)

Abstract: Starting in Fall 2021, Stony Brook University's Center for Excellence in Learning and Teaching began to offer a large enrollment online TA training course focused on general college teaching pedagogy. All new PhD students and any Master's students who are teaching are expected to complete the course. This effort grew out of an in-person training for biology TAs, which was then expanded to an online version, and plans for comparison between the two were developed by the course instructor as part of BioTAP Cohort 3. With support from the Graduate School (and a little "help" from the COVID-19 pandemic), the training was then expanded to a fully online course. Fall enrollment is typically over 350 TAs. In Fall 2023, TAs completed 4 asynchronous modules in which they submitted brief written reflections and took a quiz at the end of each module. TAs also participated in a discussion on classroom scenarios either synchronously on Zoom or asynchronously with VoiceThread, depending on their preference. Throughout the modules and discussion, TAs have opportunities to reflect and apply the general pedagogy principles to their own discipline/course context. A voluntary survey was given at the beginning and the end of the course to assess impacts on teaching confidence and perceived learning across various dimensions of teaching. We compared matched pre-post surveys from 186 participants. Our results indicate that teaching confidence significantly increased for all dimensions of teaching, regardless of discipline (STEM vs. Humanities). The course has since been updated to give TAs more choice in the module topics and they now have the option for the training to count as a 0-credit course, Fundamentals of College Teaching. If chosen, TAs complete the modules and discussion, as well as 2 additional "practice tasks" which they get feedback on. Assessment of impacts on teaching confidence is ongoing.

1:30 - 1:50 PM EST

Impact of Autonomy on Graduate Teaching Assistant's Pedagogical Discontentment and Self-efficacy, **Alyssa Freeman**, **Beari Jangir**, **Marco Said**, **Chelsea Rolle**, **Kadence Riggs**, and **Grant Gardner** (Middle Tennessee State University).

Abstract: Graduate teaching assistants (GTAs) have a large impact on the learning of undergraduate students. As such teaching professional development (TPD) is essential for supporting GTAs in their role as instructors (Gardner & Jones, 2011). Many institutions have indicated they offer voluntary TPD programs, but engagement is necessarily limited (Schussler et al., 2015). This begs the question of how we can better understand why (or why not?) STEM GTAs engage in TPD. In secondary school contexts, there is evidence to suggest that teachers' engagement and openness to reforms aligned with TPD opportunities can be driven by their pedagogical discontentment (dissatisfaction with teaching practices) and self-efficacy (confidence with teaching practices; Southerland et al., 2011). Based on this model, we hypothesized that facilitating pedagogical discontentment while supporting GTA self-efficacy might be an effective method for encouraging GTAs to engage in TPD and then consider alternative instructional methods. However, instructors, such as GTAs, who do not define their own teaching goals or classroom

practices (autonomy; Dillard et al., 2023) may not have the opportunity to develop this pedagogical discontentment that leads to engagement with TPD.

In this explanatory mixed methods study, we used correlational methods to explore the role teaching autonomy had on GTAs' perceptions of self-efficacy and pedagogical discontentment and the differences in these variables among STEM disciplines. GTAs who tended to report lower perceptions of autonomy also tended to report higher perceptions of pedagogical discontentment. An analysis of variance test indicated that biology GTAs tended to report lower perceptions of autonomy in comparison to other STEM fields. Interviews showed that the classroom environment can influence GTA's perceptions of self-efficacy and contentment. While this study provides insights into GTAs' perceptions of autonomy, pedagogical discontentment, and self-efficacy, future research will explore how various these constructs may influence GTAs to engage in professional development programs.

1:55 - 2:15 PM EST

What Teaching Assistants Want: Implications for Professional Development, **Lisa Rosen** and **Shazia Ahmed** (Texas Woman's University)

Abstract: Teaching assistants often report being anxious and unprepared for their first teaching assignment. In designing professional development materials for these new instructors, many programs do not ask teaching assistants for their perspective on what needs to be covered and how to best convey this information. Oftentimes, those leading professional development have been doing so for decades and may fail to consider the perspective of a new instructor. New teaching assistants across diverse fields may face the same fears about content delivery, classroom management, and other pedagogical issues.

The purpose of the proposed talk is to share the teaching assistant perspective and highlight implications for professional development. The talk will share findings of a focus group study that examined the perceptions of teaching assistants at a university in the southwestern United States that serves a diverse and primarily female student population. Focus group questions included: What training have you have been provided to be an effective teacher? In what ways is your training in teaching lacking? What made you most anxious about teaching? How did you best alleviate that anxiety? What advice would you offer new GTAs? How could your university better support its GTAs? Thematic analysis was conducted, and implications of findings will be highlighted.

2:15 - 2:30 PM EST

BREAK (get a snack, walk around, come back!)

2:30 - 2:50 PM EST

Levers And Barriers to Graduate Students Teaching Professional Development (GS TPD): Results from Expert Consensus Using Delphi Methodology, **Eric A. Akuoko** and **Grant E. Gardner** (Middle Tennessee State University)

Abstract: Academic Departments in the STEM fields continue to nurture the development of Graduate Teaching Assistants (GTAs) for future instructional roles in colleges and Universities in various ways and with varying quality. Despite playing critical instructional roles in undergraduate student experiences, there is a dearth of literature that has explored the institutional characteristics that define these experiences. Institutional characteristics include the cultural commitments and departmental characteristics that are supports or barriers to Graduate Student Teaching Professional Development (GS

TPD). Importantly, even where some of these cultural supports and/or departmental barriers to GS TPD are known, organizers of TPD struggle to rank and prioritize them to effect institutional change.

Drawing on the four-frame model for organizational change—people, structures, symbols, and power—we utilized a Delphi design to seek consensus from expert participants (n=45) on what departmental levers are most salient in supporting or limiting GS TPD. From a large pool of experts (n=467) we initially selected our expert sample, through a screening survey. In stage one of the Delphi study, expert participants generated a wide range of ideas on departmental cultural commitments and characteristics through a structured interview protocol. These ideas were analyzed using a priori, open coding, and summarized into a list using content analysis. In the second phase of the study, assembled supports and barriers of the results of structured interviews were provided to the participants for ranking, along the dimensions of “difficulty to change” and “impact on existence of GS TPD”. Finally, adjustments and feedback of rankings and an opportunity to re-rank, based on feedback from other participants, were applied to achieve consensus, using a survey.

Data collection is still ongoing. However, initial data analysis from pilot, prescreening expert data, and structured interviews, from consensus, show variedly ranked departmental characteristics and cultural commitments. From the people frame standpoint, results underscore bystander effect, faculty buy-in concerns, and lack of designated personnel to take up (GS TPD) as a core duty, among others, as the main cultural characteristics and/or departmental commitments that barrier GS TPD in biology academic units/departments. Further, expert consensus results from structures and symbols also, respectively, ranked the equation of occasional GS seminars, workshops, presentations, in lieu of full GS TPD; and faculty mentors’ skewed interest in research relative to teaching. No major consensual theme has yet emerged from the power frame. Regarding the drivers/levers for GS TPD, expert results ranked extra work recognition/certification and integration of GS TPD activities into the mission/vision of biology departments.

One implication of the study is to build a theory of change to serve as a guiding framework for organizing GS TPD across Biology Departments and academic units in the U.S.

2:55 - 3:15 PM EST

TAs ROCK! Exploring a Master’s-level TA-TPD Course for Components of Training that Serve as Sources of Teaching Self-efficacy Using Situational Leadership as a Framework for Delivery, Frank M. Campo Sr. (Southeastern Louisiana University)

Abstract: This study assessed a master’s-level Teaching assistant (TA) teaching professional development (TPD) course where TAs Reflect, Observe, Collaborate, and discern what to Keep in their teaching approach during weekly training as they learn to teach introductory biology labs at the study site, TAs ROCK! The primary purpose of this study was to identify which components of the TA-TPD course serve as sources to improve the teaching self-efficacy of master’s-level biology TAs. This study was conducted as a mixed methods case study using an explanatory sequential mixed methods design. TAs that were enrolled in the course at the study site volunteered as participants. Participants completed a survey for the quantitative phase of the study. A subset of these participants was purposefully selected for the qualitative interviews to obtain two strata of TAs that had higher or lower teaching self-efficacy. Situational leadership was a clear framework used to explain the behavior and actions of the lab coordinator in delivering TA-TPD training. Major components of training that improved teaching confidence of TAs included the lab coordinator modeling how to teach the labs during the weekly course meetings, providing clear expectations, and context specific pedagogy that TAs were expected to use in

teaching their labs. The lab coordinator facilitating collaborative discussions each meeting and providing autonomy to GTAs gradually through their progression of the one-year course were also found to be essential components of training. Findings from this study corroborate with previous research in that TA-TPD needs to exceed one semester of training to substantially improve GTA teaching self-efficacy. TAs also reported that gaining mastery experiences by teaching labs repetitively was one of the most important components of their training. The present study can provide insight to lab coordinators of how they may utilize situational leadership to structure and deliver their TA-TPD training.

3:20 - 4:00 PM EST

Supporting Teaching Assistants as Research Mentors in Course Based Undergraduate Research Experiences (CUREs), **Kellen Calinger-Yoak** (The Ohio State University)

Abstract: Course Based Undergraduate Research Experiences (CUREs) provide students with a realistic experience with the scientific process that traditional laboratory exercises cannot. However, Teaching Assistants (TAs) often find these open-ended, inquiry-based experiences more stressful and challenging to implement and sometimes express negative feelings toward CUREs that impact student outcomes.

Intensive TA interventions have been successful in improving TA outlooks on CURE-type experiences and have shown associated positive effects on student perceptions of learning gains (as in the SMART CURE professional development program described in Kern and Olimpo 2022). These interventions require significant time commitment from TAs to complete the required readings and attend meetings. However, many TAs will be unable or unwilling to complete such interventions while balancing their course and research work.

Here, I present a professional development intervention with iterative reflection and data analysis activities and that are completed during weekly TA meetings. Each reflection and analysis activity requires less than 30-minutes and no prior preparation. Thus, these professional development activities are easily integrated into meetings with no additional time burden on TAs. The reflection activities focus on self-assessment of skills, challenges, and opportunities for growth in the TAs' mentorship roles and promote group discussion of possible anxiety surrounding CURE implementation to encourage peer-based problem solving. The data analysis activities prompt TAs to evaluate peer-reviewed evidence regarding perceptions of CUREs by students and TAs and the effects TA competency and student motivation on student CURE perceptions. I will present preliminary evidence regarding the effects of the TA professional development intervention on student perceptions of the value of the CURE experience and perceived learning gains.

3:45 - 4:05 PM EST

Individualistic and Collectivistic Cultures as Psychosocial Factors that Modify Effectiveness of Written Instructor Feedback, **Anthony Majin, Elise C. Bui, and Audrey Chen Lew** (University of California, Irvine)

Abstract: Successful teaching professional development must train teaching assistants how to provide effective feedback to students. Instructor comments are most effective when they take into consideration differences between students. Psychosocial factors play a large role in shaping undergraduate experiences and learning (Fennie et al., 2020). Perceptions of self-reliance, achievements, hedonism, competition, and interdependence differ between individualistic and collectivist cultures (Triandis et al., 1988) and can affect motivation and learning. Since an individual's perception changes depending on

their aligned culture, cultural background likely affects how a student chooses to respond to instructor feedback. The presentation will describe our work to identify how collectivist cultures and individualistic cultures may affect student perception of instructor feedback and affect a student's selected action following instructor feedback. Participants were initially screened based on their alignment with collectivist or individualistic cultures through the Individualism and Collectivism scale (also known as the Culture Orientation Scale; Triandis & Gelfland, 1998). Data from surveys was triangulated with semi-structured interview. We found that students with low vertical collectivism levels were more likely to prefer positive feedback, while some students with collectivist cultural background valued directive feedback over facilitative feedback and a sense of collaboration. Cultural orientation does not influence whether a student preferentially seeks written feedback from a professor or teaching assistant, but students with high vertical individualism levels were more likely to use written feedback from a professor than a teaching assistant. Many students related family structure to the professor-TA-student relationship, where professors hold authority that makes student approach them differently than a TA. These findings suggest that delivering effective feedback may be more complex than originally thought. Cultural orientation affects the student-teaching assistant relationship differently than the student-faculty relationship and modify the effectiveness of written instructor feedback.

4:05 - 4:15 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.

The Evolving the Culture of Biology (ECB) program is a federally-funded grant (NSF-IUSE: 2142742) designed to support the transformation of institutional Teaching Professional Development for Teaching Assistants (TA-TPD) in the biological sciences.

