Biology Teaching Assistant Project
2025 Virtual Conference

October 21-22, 2025

https://syracuseuniversity.zoom.us/j/95536857313?pwd=JGhen9AyJIOpc4sbK2raJI28Rj2gBr.1

Meeting ID: 955 3685 7313
Passcode: 579165

BioTAP
Biology Teaching Assistant Project

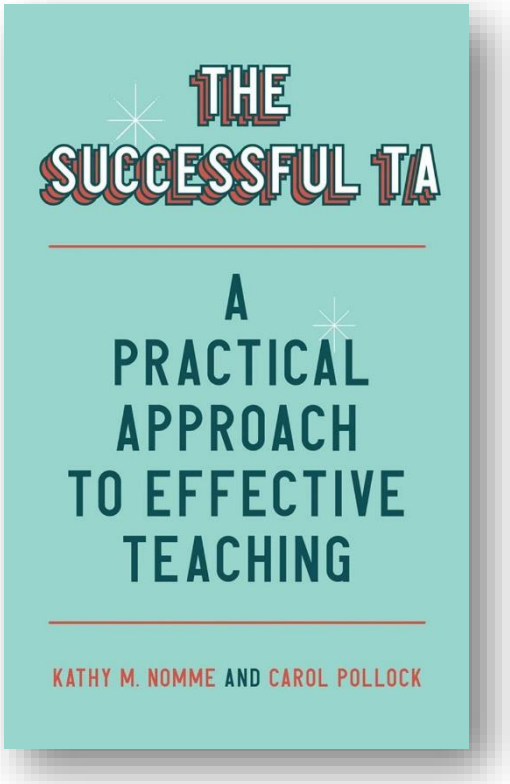
Conference webpage: https://biotap.org/biotap-virtual-conference/

BioTAP: https://biotap.org/

BioTAP 2025 Virtual Conference Schedule at a Glance:

TIME (EST)	Presenter(s)	Title
Tuesday, October 21		
1:00 PM		**Introduction and Welcome**
1:15 PM	Nomme, K., & C. Pollock	**Keynote & Workshop –** *Effective GTA Training*
2:45 PM		**BREAK**
3:00 PM	J. Reid	**Leadership Update and Community Hour**
4:00 PM	*BioTAP Ed Committee*	*Education Committee Overview*
4:30 PM		**Day 1 Conclusion**
Wednesday, October 22		
1:00 PM		**Welcome back**
1:05 PM	Westwood, N. E., & D. S. Srivastava	*Perspectives of graduate student teaching assistants on value and meaning in their role*
1:30 PM	Gardner, G., Akuoko, E., Marbach-Ad, G., Miller, K., & E. Schussler	*Department Cultural Supports and Barriers for Implementing Biology Graduate Student Teaching Professional Development: A Delphi Study*
1:55 PM	Solan, C. A.	*Instructional Modeling Framework: Making Teaching Moves Explicit*
2:20 PM	Weigel, E., & J. Reid	*Extending the TPI: What Reflective Prompts Reveal about TA Teaching Perspectives*
2:40 PM		**BREAK**
2:55 PM	Torres, M., & C. Overmyer	*Beyond Logistics: Building Effective TA Professional Development for a large enrollment STEM course*
3:20 PM	Shihadih, D. S., Baez, E. R., Asgari, M., Berl, J., Chouinard, A. J., Gutzler, S. J., Heinrich, K. K., Riordan, E., Lee, S. W., & E. E. Shortlidge	*Assessing the Evolving the Culture of Biology Program through the lens of the Teacher Centered Systemic Reform (TCSR) Model*
3:45 PM	Anderson, G., Ryker, K. D. A., Hardee, M. L., & K. L. Kathrein	*Novice STEM GTAs' Persistent Concerns: Classroom Climate, Communication, and Effective Teaching Practices*
4:10 PM	Korunova, E.	*Teamwork in Molecular Design: Introduction to an Industry-Scale Collaborative Platform*
4:30 PM		**Closing**

Keynote Profiles:



Carol Pollock, Ph.D.

Professor Emerita
Department of Zoology
University of British Columbia, Canada

Carol Pollock is a Professor of Teaching Emerita in the Department of Zoology at the University of British Columbia (UBC). She was first hired as a Sessional Lecturer at UBC in 1980 and from that time until her retirement at the end of 2016, she was involved with preparing TAs for their roles in the labs and lectures in the courses she taught. In the 1990s, she expanded this to include professional development for all TAs in biology undergraduate courses (also called BioTAP). BioTAP evolved from a single session at the beginning of September to seven sessions throughout the academic year. In 2014, she was asked to be part of a committee to establish national standards for GTA training in the U.S. (BioTAP) and she worked with this committee until 2017. In addition to TA training, some of her other areas of research interest have been the pedagogy of investigative learning, self-regulated learning, scientific teaching, concept inventories, and peer teaching. She has several publications and conference presentations including the book, The Successful TA: A Practical Approach to Effective Teaching with her long-time colleague and friend, Kathy Nomme. She is currently the president of Brighton College in Burnaby, B.C.

Kathy Nomme

Professor of Teaching, Emerita
Departments of Botany and Zoology
University of British Columbia, Canada

Kathy Nomme has over four decades of teaching experience. She completed a Professional Development Program (PDP) at Simon Fraser University and taught in the public school system until entering a graduate program in Botany at the University of British Columbia where she first experienced the challenges of being a GTA. Several years later she was hired as Faculty for the 1st Year Biology Program, first as an instructor, then rising through the ranks to become a full Professor of Teaching. She was the valedictorian of the Faculty Certificate Program and completed the Systematic Training for Effective Teaching (STET) at UBC. She was awarded the Killam Teaching Award for the Faculty of Science. Working with and training GTAs in the

Biology Program was a primary focus of her career. The UBC version of BioTAP grew from a one-day orientation to a series of seven workshops that included active-learning techniques for exploring topics that GTAs new to teaching requested. Kathy also co-taught a graduate level course on Teaching and Learning in the Life Sciences as well as several first year Biology lab and lecture courses. Her primary research focus has been the transition of high school students to the culture of learning at a university. She has published numerous articles on student misconceptions, student attitudes towards biology, and self-regulated learning as well as related presentations at conferences. Her research further informed the essential components of GTA training, especially when interacting with undergraduate students in their first year of university. This work culminated in the publication of the book “The Successful TA: A Practical Approach to Effective Teaching” with her long-time colleague Dr. Carol Pollock.

Biology Teaching Assistant Project
2025 Virtual Conference

Tuesday, October 21, 1:00PM - 4:30PM EST
Wednesday, October 22, 1:00PM - 4:30PM EST

Schedule and Abstracts

Tuesday, October 21

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

1:15 - 2:45 PM EST **Conference Keynote and Workshop**

Effective GTA Training

Kathy Nomme & Carol Pollock (University of British Columbia)

Abstract: The success of a Graduate Student Teaching Assistant (GTA) often rests on adequate preparation for their role. In this workshop we will explore essential training for GTAs: 1) We will work together to identify important aspects of GTA roles and responsibilities that need to be included in training sessions, 2) We will discuss how to evaluate GTA training sessions and gauge the overall effectiveness of GTA training programs, and 3) We will review examples of research on teacher training, and identify some common elements of research design that can be adapted to your own investigations related to GTA training.

2:45 – 3:00 PM EST **BREAK** (get a snack, walk around, come back!)

3:00 – 4:00 PM EST **Leadership Update and Community Hour**

Josh Reid (Current President, Texas Tech University)

4:00 – 4:30 PM EST **Education Committee Update**

4:30 PM EST **Day 1 Conclusion**

Return tomorrow at 1:00 PM EST for Day 2!

Wednesday, October 22

1:00 - 1:05 PM EST **Welcome back**

1:05 - 1:25 PM EST

Perspectives of graduate student teaching assistants on value and meaning in their role, **Natalie E. Westwood** (University of British Columbia), **Diane S. Srivastava** (University of British Columbia)

Abstract: There is increasing reliance on graduate student teaching assistants (GTAs) in undergraduate education, yet the impact of this role on graduate students is understudied. Previous research has focused on tangible outcomes such as skill development, rather than how GTAs value or find meaning in this role. Our study used a phenomenological approach rooted in self-determination theory to allow graduate students to describe their own experience of being GTAs and how they found value and created meaning through their role. We conducted interviews with five GTAs and used thematic analysis to describe their experiences. Generally, GTAs found the experience to be an important and positive aspect of their graduate program, intentionally using the experience to explore potential career paths and find belonging in the wider academic community. However, GTAs also identified several challenges, including pressure to exceed their contracted hours, and some GTAs saw these challenges as ethical dilemmas that were difficult to resolve. Overall, our study demonstrates the deep mindfulness that GTAs use when reflecting on their experiences and making choices within their role. Given the reflection that GTAs bring to their role, we recommend that those who train and work with GTAs actively support their professional development through centering GTA needs in order to enhance the experience of GTAs in the classroom.

1:30 - 1:50 PM EST

Department Cultural Supports and Barriers for Implementing Biology Graduate Student Teaching Professional Development: A Delphi Study, **Grant Gardner** (Middle Tennessee State University), **Eric Akuoko** (St. John's University), **Gili Marbach-Ad** (University of Maryland), **Kristen Miller** (University of Georgia), **Elisabeth Schussler** (University of Tennessee-Knoxville)

Abstract: Graduate students (GS) in the STEM fields are critical instructors for supporting the success and retention of undergraduate students. However, these instructors are often unsupported in their efforts to become more effective instructors through Teaching Professional Development (TPD). Although there are various reasons that departments in higher education might choose not to implement high-quality TPD for their graduate students, one area that has been little considered is the department's culture. In this Delphi study, we collected data from a cohort of n = 49 experts in GS TPD to reach expert consensus on the critical components of a biology department culture that might support or hinder the implementation of GS TPD. This was done through three iterative rounds that included an initial semi-structured interview followed by two Delphi ranking surveys. Cultural supports and barriers were categorized using the Four Frames taxonomy (Reinholz & Apkarian, 2018). Findings are being used to develop departmental self-assessment tools to support institutional change efforts around GS TPD.

1:55 - 2:15 PM EST

Instructional Modeling Framework: Making Teaching Moves Explicit, **Christine A. Solan** (John Hopkins University)

Abstract: Effective TA training should do more than deliver information—it should model the very act of teaching. The Instructional Modeling Framework offers a structured, replicable approach for designing workshops that equip Biology TAs with the practical skills they need as TAs, while simultaneously immersing them in examples of effective teaching.

This framework transforms professional development into active pedagogy by making instructional strategies visible, intentional, and transferable. Facilitators "pull back the curtain" to reveal the design, rationale, and classroom application of teaching moves, helping TAs understand not just what works, but why it works.

Built on six core components—Learning Objectives, Resources, Personal Connection, Interaction, Active Learning, and Reflection & Evaluation—the framework supports the creation of workshops that are inclusive, engaging, and grounded in STEM education research. Each session is designed to meet TAs where they are: addressing the practical realities of their instructional roles while modeling strategies they can apply in their own classrooms and labs.

Drawing on examples from Biology TA training at Johns Hopkins University, this presentation will demonstrate how the Instructional Modeling Framework enhances pedagogical confidence, fosters reflective practice, and improves student engagement. Attendees will leave with a flexible framework for designing TA workshops that are both informative and transformative—where teaching is taught by example.

2:20 – 2:40 PM EST

Extending the TPI: What Reflective Prompts Reveal about TA Teaching Perspectives, **Emily Weigel** (Texas Tech University), **Josh Reid** (Texas Tech University)

Abstract: Graduate and undergraduate teaching assistants (TAs) play a central role in undergraduate science instruction, yet little is known about how their beliefs about teaching evolve during early teaching experiences. This study investigates how reflective prompts embedded within a semester-long teaching professional development (TPD) course shaped TAs' perspectives of teaching and learning. The course was grounded in best practices for TPD, including active engagement, relevance, and reflection (Desimone & Garet, 2015). Beliefs, intentions, and actions guiding instructional choices (teaching perspectives) have been categorized into five areas: transmission, apprenticeship, nurturing, developmental, and social reform (Pratt & Collins, 2000).

We addressed two research questions: (1) How do TAs' teaching perspectives vary before and after participation in a reflective curriculum? and (2) How do teaching perspectives relate to definitions of teaching, learning, and grading? Data were collected across three semesters from TAs at a large Southeastern research-intensive university using a mixed-methods design. The Teaching Perspectives Inventory (TPI) was administered pre/post-course, and open-ended responses were coded using established frameworks (Pratt, 2001; Sfard, 1999) and inductive analysis.

Findings show that precourse, TAs most frequently held nurturing perspectives (29.6%), followed by apprenticeship and transmission. Postcourse, nurturing remained dominant (30.4%), but increases in transmission (19%) and developmental orientations were observed. Qualitative reflections revealed nuanced shifts; for example, one TA reframed teaching from “imparting knowledge” to “providing base-level information for higher-order thinking.” Definitions of learning were overwhelmingly coded as “acquisition” rather than “participatory,” and TAs conceptualized grading primarily as a measure of learning, teacher feedback, or student feedback.

This study contributes to research on TPD by illuminating how reflective prompts surface and shape the perspectives TAs bring to teaching. Results inform ongoing efforts to align TA preparation with evidence-based practices and highlight the importance of integrating reflection to foster perspective change.

2:40 - 2:55 PM EST **BREAK** (get a snack, walk around, come back!)

2:55 - 3:15 PM EST

Beyond Logistics: Building Effective TA Professional Development for a large enrollment STEM course, **Monica Torres** (Rutgers, The State University of New Jersey), **Christina Overmyer** (Rutgers, The State University of New Jersey)

Abstract: Teaching assistants (TAs) play a pivotal role in undergraduate STEM education, often serving as the primary point of contact for students in laboratory sections and student support hours. Yet, while expectations for TAs are high, the institutional professional development they receive is frequently minimal, unevenly structured. This talk will be on the design and implementation of the TA teaching professional development program implemented for a large enrollment laboratory course, which balances the logistics needed for a large enrollment course but also focuses on professional development, pedagogy, and student success.

Our program incorporates active learning, peer mentoring, and continuous feedback to cultivate evidence-based teaching practices and foster transferable skills such as communication, collaboration, and inclusive teaching. Special attention is given to the role of effective weekly support for successfully facilitating student learning. Weekly Prep meetings provide insights on topics such as fostering student engagement, implementing effective grading and feedback practices, and navigating challenging situations. Participants also had the opportunity to connect with peers across disciplines, building a peer supportive network. The course is supported by a staff supervision team that assists the TAs by organizing the laboratory, preparing reagents, and maintaining equipment. They help train TAs in technical and soft skills. The supervision team serves as a first point of contact while the sections are running in the event of an emergency or when immediate assistance is needed.

Despite the TAs' central role in supporting student learning, their effectiveness can be influenced by persistent challenges, including sustaining TA motivation and engagement over the semester, maintaining consistency across course sections in the enforcement of policies and grading practices, and addressing the wide variation in TA preparation. This variation extends not only to laboratory and technical skills but also to essential soft skills such as communication, leadership, and classroom management.

3:20 – 3:40 PM EST

Assessing the Evolving the Culture of Biology Program through the lens of the Teacher Centered Systemic Reform (TCSR) Model, **Diyala S. Shihadih** (University of New Mexico), **Elizabeth Runkel Baez** (Portland State University), **Mitra Asgari** (University of Missouri), **Justin Berl** (Portland State University), **Adam J. Chouinard** (Oregon State University), **Stephanie J. Gutzler** (Georgia State University), **Kaleb K. Heinrich** (University of Alabama), **Eden Riordan** (Portland State University), **Star W. Lee** (University of California Irvine), **Erin E. Shortlidge** (University of New Mexico)

Abstract: There are persistent national calls to advance evidence-based instructional practices to, in turn, increase the number of students graduating with science degrees (AAAS 2011, PCAST 2012). Evolving the Culture of Biology (ECB) is a program designed to improve undergraduate education by prioritizing graduate teaching assistant teaching professional development (TA-TPD). Guided by the Teacher-Centered Systemic Reform (TCSR) model (Woodbury and Gess-Newsome 2002, Gess-Newsome et al. 2003), this study examined how teacher attitudes, personal factors, institutional contexts, and instructional practices shape TA-TPD reform outcomes.

At the start of the program scholars participated in a survey to measure constructs of the TCSR using both existing and newly-developed measures (Gibbons et al. 2018). We measured personal factors (e.g., educational background), cultural context (e.g., value of teaching), and teacher beliefs (e.g., learning beliefs). We conducted end-of-year semi-structured interviews to gain insight into scholars' experiences as they implemented reformed TA-TPD. Interview questions were iteratively developed leveraging the TCSR as a guiding framework. Transcripts were coded by multiple researchers using inductive and deductive methodology to identify overarching themes and develop a codebook.

Both the surveys, interviews, and program artifacts were used to investigated how TCSR components differentially influenced participant progress and whether consistent patterns emerged among reform approaches, barriers, and outcomes. Cultural context, dissatisfaction with previous programming, and participants' departmental positions in relation to structural power emerged as critical influences on implementation and approach. Further analysis led to the development of three institutional "profiles": Long Strides, started with minimal to no TA-TPD programming and created substantial growth in TA-TPD infrastructure; Refiners, expanded and updated existing programs, specifically adding lessons on pedagogy; and High-Barriers, Low Buy-In, who faced insurmountable barriers that prevented ability to reach reform goals. This study adds to the literature on systemic change as we work towards improving undergraduate education.

3:45 - 4:05 PM EST

Novice STEM GTAs' Persistent Concerns: Classroom Climate, Communication, and Effective Teaching Practices, **Georgina Anderson** (University of South Carolina), **Katherine D. A. Ryker** (University of South Carolina), **Michelle L. Hardee** (University of South Carolina), **Katie L. Kathrein** (University of South Carolina)

Abstract: Graduate Teaching Assistants (GTAs) facilitate a high proportion of undergraduate courses but have historically received little training in pedagogy. At the University of South Carolina, Teaching Assistant Orientation, GRAD 701 and several Certificate Programs are available to GTAs through the Center for Teaching Excellence to provide professional development and support to meet the variety of needs GTAs experience. From Fall 2020 to Fall 2022, short surveys were administered to more than

1,000 GTAs entering graduate programs at USC to capture their confidence in teaching ability, excitement about their GTA role, and various teaching-related concerns at specific points during their first semester.

Survey responses revealed STEM GTAs experienced uniquely elevated, persistent concerns about creating a positive classroom environment and communicating effectively with students. These anxieties remained elevated across the semester, even as similar concerns among GTAs in other disciplines declined, suggesting a particular need for discipline-specific supports. Their concerns were especially pronounced among international STEM GTAs, underscoring the importance of teaching professional development that addresses both cross-cultural communication and inclusive classroom practices. Simultaneously, concerns about implementing effective teaching methods increased for all GTAs, rather than diminishing with classroom experience. Notably, this was the only area in which concerns intensified during the semester, with STEM, Healthcare, and Other GTAs reporting significant increases, suggesting that early teaching experiences give rise to new pedagogical challenges rather than alleviating them. This pattern points to a critical window for follow-up professional development after GTAs complete their first semester, when the challenges of applying evidence-based pedagogy become most apparent. Finally, GTAs in STEM, Social Science, Healthcare and Other degree programs expressed consistent anxieties about time and task management. These universal concerns, coupled with the discipline-specific challenges faced by STEM GTAs, highlight the importance of targeted, ongoing professional development opportunities that address both shared and field-specific needs.

4:10 – 4:30 PM EST

Teamwork in Molecular Design: Introduction to an Industry-Scale Collaborative Platform, **Elizaveta Korunova** (University of South Carolina)

Abstract: This talk provides educators with a step-by-step overview of implementing an industry-inspired molecular cloning module using Benchling, a cloud-based platform widely adopted in biotechnology and pharmaceutical sectors, supported by the Center for Teaching Excellence USC Grant for teaching assistants. Participants will learn how authentic molecular design practices can be translated into an engaging undergraduate laboratory experience that enhances student collaboration, technical skills, and understanding of experimental design.

The presentation will detail the module as implemented in the BIOL 541L/CHEM 550L Biochemistry Laboratory course, including:

1. An example of a Teaching Assistant grant application, including its purpose, rationale, and impact on supporting TA professional development and student learning.

2. The design and optimization of the module protocol in collaboration with peer TAs and teaching assistants.

3. Student-friendly introduction to molecular cloning concepts using a structured curriculum requiring only a computer and internet access.

4. Integration of gamified learning elements, such as “grant pitch” presentations by undergraduate biochemistry students.

5. Assessment strategies including after-lab assignments, virtual experiment evaluations, and rubric-based presentations, providing actionable feedback to both students and instructors.

Attendees will gain insight into the process of developing and implementing a research-driven, industry-informed lab module, including the challenges, strategies for optimization, and reflections from student outcomes. This talk provides practical guidance for teaching assistants interested in incorporating authentic virtual design practices into their courses and demonstrates how structured TA involvement and support can enhance both student learning and teaching effectiveness.

4:30 PM EST **Day 2 Conclusion / Conference 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.